

## Chromatography Systems and Accessories

Bio-Rad offers a complete line of laboratory-scale chromatography instruments that are flexible, upgradable, and easy to use. These instruments are specifically designed for protein separations, paying close attention to the selection of materials, fraction collection, and the programming flexibility required when working with biological samples.

### Chromatography System Selection Guide

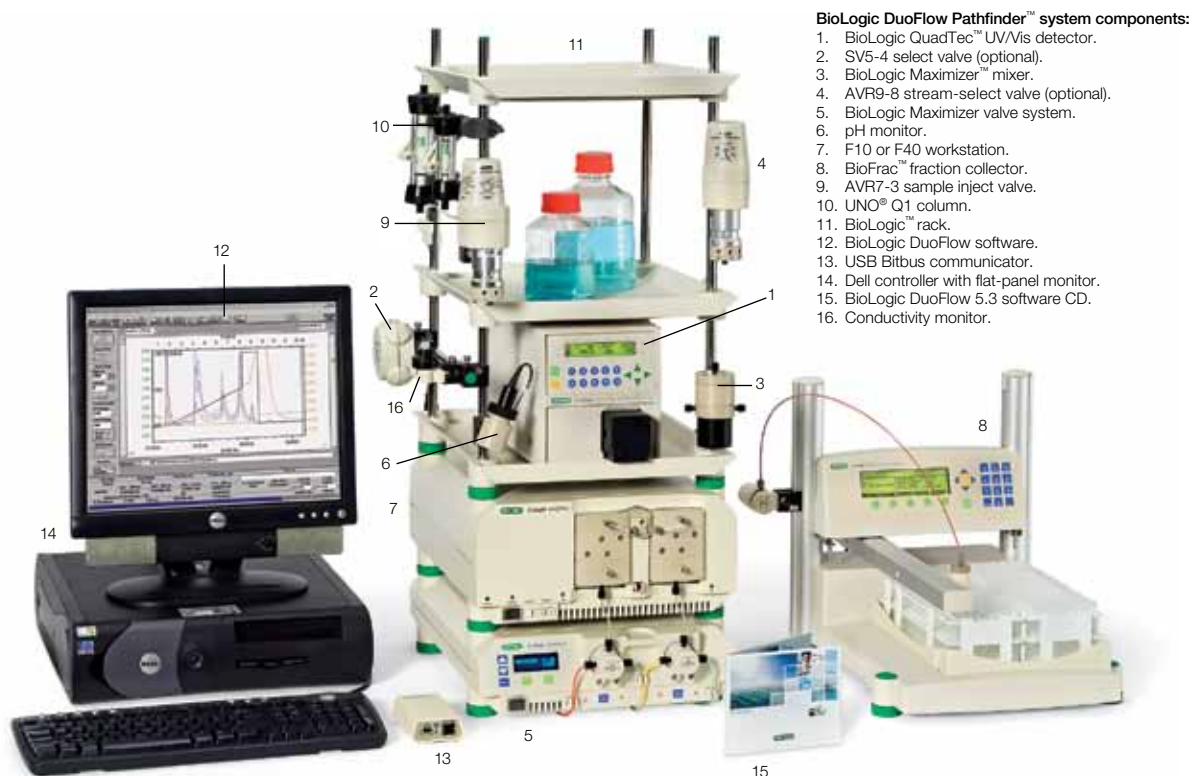
	Flow Rate	Pressure Limit	Techniques	UV Detection	Conductivity	pH Monitor	Sample Loading	Fraction Collection	Gradient
<b>Medium-Pressure Chromatography Systems</b>									
BioLogic DuoFlow™ 10	0.01–10 ml/min	3,500 psi/ 233 bar/ 23 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT™	254 and 280 nm	1–500 ms/cm	Optional	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac™ fraction collector	•
BioLogic DuoFlow 40	0.5–40 ml/min	1,000 psi/ 66 bar/ 6.6 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT™	254 and 280 nm	1–500 ms/cm	Optional	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow QuadTec™ 10	0.01–10 ml/min	3,500 psi/ 233 bar/ 23 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	190–740 nm	1–500 ms/cm	Optional	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow QuadTec 40	0.5–40 ml/min	1,000 psi/ 66 bar/ 6.6 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	190–740 nm	1–500 ms/cm	Optional	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow Maximizer™ 20	0.02–20 ml/min	3,500 psi/ 233 bar/ 23 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	254 and 280 nm	1–500 ms/cm	Included	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow Maximizer 80	1–80 ml/min	1,000 psi/ 66 bar/ 6.6 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	254 and 280 nm	1–500 ms/cm	Included	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow Pathfinder™ 20	0.02–20 ml/min	3,500 psi/ 233 bar/ 23 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	190–740 nm	1–500 ms/cm	Included	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
BioLogic DuoFlow Pathfinder 80	1–80 ml/min	1,000 psi/ 66 bar/ 6.6 Mpa	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	190–740 nm	1–500 ms/cm	Included	50 µl–90 ml loops and AVR7-3 automated sample inject valve	External; Model 2110 or BioFrac fraction collector	•
<b>Low-Pressure Chromatography Systems</b>									
Profinia™	0.2–20 ml/min	45 psi/ 3.4 bar	Affinity, desalting (automated sequence)	280 nm	0–500 ms/cm	Optional	15–50 ml conical tubes	Internal; 15–50 ml conical tubes	—
BioLogic™ LP dual peristaltic pump	0.04–40 ml/min	30 psi/ 2 bar	Affinity, ion-exchange, size exclusion/desalting, HIC, CHT	254 and 280 nm	0–500 ms/cm	—	Custom-sized loops and MV6 manual sample inject valve	External; Model 2110 or BioFrac fraction collector	•
Econo™ pump	0.01–20 ml/min	30 psi/ 2 bar	Affinity, size exclusion/desalting, HIC, CHT	254 and 280 nm	—	—	—	External; Model 2110 or BioFrac fraction collector	—
Econo gradient pump	0.002–40 ml/min	30 psi/ 2 bar	Affinity, ion exchange, size exclusion/desalting, HIC, CHT	254 and 280 nm	0–500 ms/cm with EG monitor	—	Custom-sized loops and MV6 manual sample inject valve	External; Model 2110 or BioFrac fraction collector	•

## Medium-Pressure Systems

Bio-Rad offers the BioLogic DuoFlow™ family of medium-pressure protein purification systems, capable of operating at 1,000–3,500 psi (66–233 bar) with flow rates ranging from 0.01 to 80 ml/min.

### BioLogic DuoFlow™ Systems

Order Info: Pg 94



#### BioLogic DuoFlow Pathfinder™ system components:

1. BioLogic QuadTec™ UV/Vis detector.
2. SV5-4 select valve (optional).
3. BioLogic Maximizer™ mixer.
4. AVR9-8 stream-select valve (optional).
5. BioLogic Maximizer valve system.
6. pH monitor.
7. F10 or F40 workstation.
8. BioFrac™ fraction collector.
9. AVR7-3 sample inject valve.
10. UNO® Q1 column.
11. BioLogic™ rack.
12. BioLogic DuoFlow software.
13. USB Bitbus communicator.
14. Dell controller with flat-panel monitor.
15. BioLogic DuoFlow 5.3 software CD.
16. Conductivity monitor.

The BioLogic DuoFlow family of chromatography systems offers flexibility with multiple system configurations, many optional upgrades, and a common software platform that is intuitive and easy to follow. These systems can be used on the laboratory bench or in a coldroom and are suitable for analytical and preparative chromatography.

A Dell PC controller enables easy communication with the workstation and peripheral devices via an external USB Bitbus communicator. The controller includes the Windows 7 operating system, application software, keyboard, mouse, and high-resolution flat-panel monitor.

#### Upgradable Systems Add Capability As Your Needs Change






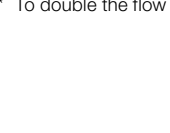


BioLogic DuoFlow modular components allow the system to meet both laboratory space and application requirements; as requirements change, systems may be easily reconfigured and seamlessly upgraded with increased functionality, such as higher flow rates, sophisticated detection capabilities, pH monitoring, column scouting, and buffer blending. The BioLogic DuoFlow system selection guide on the next page lists the systems, their functions, and available options.

#### For More Information

Web: [www.bio-rad.com/mediumpressure](http://www.bio-rad.com/mediumpressure)

Request or download bulletins: 2687 and 5369

### BioLogic DuoFlow System Selection Guide

	F10 Pump	F40 Pump	BioFrac Fraction Collector	BioLogic Maximizer Valve System	BioLogic QuadTec UV/Vis Detector	UV (254/280 nm) Detector	Conductivity Monitor	214 nm Conversion Kit	pH Monitor
Page numbers for components	79	79	85	79	80	80	80	80	80
 <b>BioLogic DuoFlow 10 system</b> 0.01–10 ml/min flow rate, 3,500 psi	•	◦	◦	◦	◦	•	•	◦	◦
 <b>BioLogic DuoFlow 40 system</b> 0.5–40 ml/min* flow rate, 1,000 psi	◦	•	◦	◦	◦	•	•	◦	◦
 <b>BioLogic DuoFlow QuadTec 10 system</b> 0.01–10 ml/min* flow rate, 3,500 psi	•	◦	◦	◦	•	◦	•	◦	◦
 <b>BioLogic DuoFlow QuadTec 40 system</b> 0.5–40 ml/min* flow rate, 1,000 psi	◦	•	◦	◦	•	◦	•	◦	◦
 <b>BioLogic DuoFlow Maximizer 20 system</b> 0.02–20 ml/min flow rate, 3,500 psi	•	◦	•	•	◦	•	•	◦	•
 <b>BioLogic DuoFlow Maximizer 80 system</b> 1–80 ml/min flow rate, 1,000 psi	◦	•	•	•	◦	•	•	◦	•
 <b>BioLogic DuoFlow Pathfinder 20 system</b> 0.02–20 ml/min flow rate, 3,500 psi	•	◦	•	•	•	◦	•	◦	•
 <b>BioLogic DuoFlow Pathfinder 80 system</b> 1–80 ml/min flow rate, 1,000 psi	◦	•	•	•	•	◦	•	◦	•

• Included as standard; ◦ option or upgrade.

\* To double the flow rate, use the BioLogic Maximizer valve system.

**BioLogic DuoFlow™ Workstations and Accessories**

Order Info: Pg 95

**BioLogic DuoFlow Workstations**

The BioLogic DuoFlow workstations, with options of F10 or F40 pumps to accommodate different flow rates, include mixer barrel extenders that provide reproducible separations across the entire range of flow rates.

The workstation integrates stream-select, sample loading, and diverter valves. The pumphead can be removed easily from the workstation for routine maintenance.

The BioLogic DuoFlow F10 workstation is a component of all BioLogic DuoFlow 10 and 20 systems. The BioLogic DuoFlow 40 workstation is a component of all BioLogic DuoFlow 40 and 80 systems.

**F10 and F40 Pump Kits**

The pump kits used in the BioLogic DuoFlow workstation are interchangeable. The F10 pump enables a flow rate of 0.01–10 ml/min at 3,500 psi (233 bar, 23 MPa), and the F40 pump enables up to 40 ml/min at 1,000 psi (66 bar,



6.6 MPa). Flow rates for each pumphead can be doubled with the addition of the BioLogic Maximizer™ valve system. The kits contain fully assembled pumpheads with seals and check valves installed for fast, easy pumphead changes.

**Mixers**

The Model MX-1 and BioLogic Maximizer mixers ensure improved gradient quality for more accurate separations.

**BioLogic Maximizer™ Valve System**

Order Info: Pg 95

This valve system expands the capabilities of BioLogic DuoFlow™ systems. It enables buffer blending, doubled flow rates, and twice the valve capacity of the standard BioLogic DuoFlow system, and is compatible with any existing BioLogic DuoFlow system. The BioLogic Maximizer allows:

- Buffer blending of up to 4 stock solutions
- More versatility in sample-handling with 6 low-pressure and 6 high-pressure controls valves
- 80 ml/min flow rates with a 12 ml mixer barrel extender for the large dynamic mixer
- Automation of runs using multiple protocols
- Higher flow rates for pilot scale-up studies

**For More Information**

Web: [www.bio-rad.com/medpressurecomponents](http://www.bio-rad.com/medpressurecomponents)  
Request or download bulletin: 2700

### BioLogic DuoFlow™ Detectors

Order Info: Pg 96

#### BioLogic DuoFlow UV Detector with Conductivity Monitor

- Standard 254 and 280 nm filters
- Replaceable lamp with 365, 405, and 436 nm expansion filters
- 214 nm conversion kit with zinc lamp
- Standard analytical 5 mm flow cell or optional preparative 2 mm flow cell
- UV absorbance range from 0.0001 to 2.0 OD
- Conductivity detection range from 1 to 500 mS/cm



UV Detector with Conductivity Monitor

#### BioLogic QuadTec™ UV/Vis Detector

The detector enables the simultaneous monitoring of four wavelengths for greater sensitivity without background interference. It is available as a stand-alone unit or as an upgrade to existing BioLogic DuoFlow systems.

- Individual scaling and colored onscreen chromatogram trace for each wavelength in BioLogic DuoFlow 5.1 software
- Wavelength range of 190–740 nm (with deuterium lamp at 190–370 nm and optional halogen lamp at 370–740 nm)
- ICM to digitally communicate signal to BioLogic DuoFlow workstation



BioLogic QuadTec UV/Vis Detector

#### For More Information

Web: [www.bio-rad.com/mediumpressurecomponents](http://www.bio-rad.com/mediumpressurecomponents)

Request or download bulletin: 2845

#### Signal Import Module (SIM)

The optional SIM allows import of an analog signal (up to 2.5 V) from a pH electrode or other external detector (for example, UV, refractive index, or fluorescence monitor). BioLogic DuoFlow system software accommodates two SIMs and can display up to four data signals simultaneously.



Signal Import Module

#### BioLogic DuoFlow pH Monitor

This inline monitor enables real-time monitoring of pH during a sample run. It is included with all BioLogic DuoFlow Maximizer™ and BioLogic DuoFlow Pathfinder™ systems and is also available as an option for the BioLogic DuoFlow system that connects via a SIM. It is supplied with a tubing kit that includes installed 1/4–28 fittings.

- High-precision calomel electrodes, which ensure full compatibility with buffers that are incompatible with Ag/AgCl electrodes
- Flow rates to 80 ml/min
- A biocompatible PEEK flow cell with a swept volume of approximately 80 µl, to yield high precision and accuracy



BioLogic DuoFlow pH Monitor

### BioLogic DuoFlow™ Valves and Accessories

Order Info: Pg 96

#### BioLogic DuoFlow Valves

The high-pressure sample injection and stream-select valves, AVR7-3 and AVR9-8, prevent pressure spikes when the valve rotates from one port to another. This feature eliminates baseline interference and is beneficial when using fragile low-pressure columns or flow-sensitive detectors. It also prevents pump shutdowns due to transient overpressure conditions. These valves can be used alone or in combinations. A valve rebuild kit is available for four valve types.

#### Sample Loading Options

- **Single-injection loops for the AVR7-3 sample inject valve** — for 25 µl to 5 ml samples
- **DynaLoop™ sample loops** — dynamic (sliding piston) 25 ml and 90 ml sample loops allow large-volume sample loading or repetitive injection of smaller volumes
- **Econo™ gradient pump or Model EP-1 Econo pump** — can load large sample volumes directly onto the column
- **SV5-4 select valve** — can be used to automate large sample loading or as a buffer selector in chromatography protocols
- **SVT3-2 diverter valve** — can be used as a buffer selector, for large sample loading, and for diverting buffer flow

#### BioLogic DuoFlow Valves

##### AVR7-3 Valve

- Automation of single sample injections using single-injection loops (from 25 µl to 5 ml)
- Reverse-flow chromatography for affinity purifications
- Two-column switching
- Sequential binding and elution

##### AVR9-8 Valve

- Multiple buffer selection
- Eight-column switching
- Large-volume fraction collection
- Tandem chromatography

##### SV5-4 Select Valve

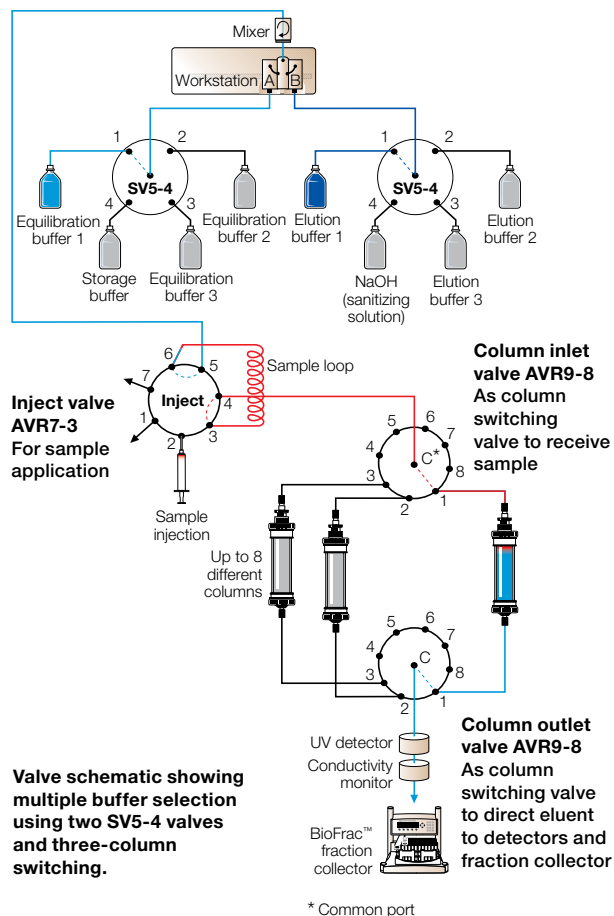
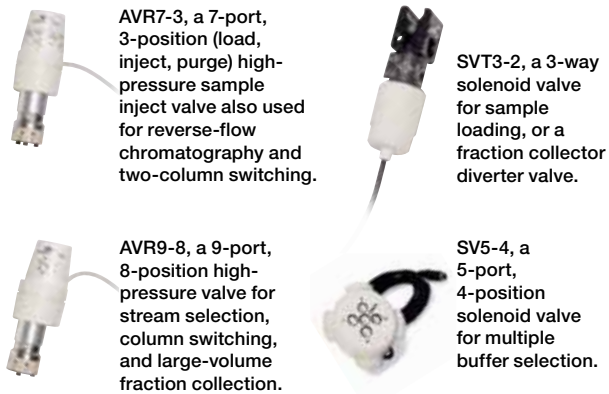
- Automation of large-sample loading
- Buffer selection in chromatography protocols

##### SVT3-2 Diverter Valve

- Buffer selection
- Loading of large samples
- Diverting buffer flow

#### For More Information

Web: [www.bio-rad.com/medpressurecomponents](http://www.bio-rad.com/medpressurecomponents)



**BioLogic DuoFlow™ Software, Version 5.3**

Order Info: Pg 97

BioLogic DuoFlow software is easy and intuitive. It walks you step by step through simple protocols to create and run methods and analyze the results. The software provides functions such as:

- **Scouting wizard** — provides simplified setup of scouting experiments
- **Method templates** — allow easy method creation with predefined chromatography method templates for all commonly used chromatography experiments
- **Buffer blending** — controls automatic blending of up to 4 stock solutions when used in combination with the BioLogic Maximizer™ valve system

BioLogic DuoFlow software provides peak recovery control and data review with the following features:

- **Trace Compare function** — permits overlay of different chromatograms for comparison of runs
- **Fraction identification** — provides BioFrac™ fraction collector numbering schemes that number tubes by collection order or by rack grid number

- **Threshold collection** — allows collection of fractions when a detector signal is above or below a defined threshold
- **Tagging of peaks** — labels peaks with name, retention time, absorbance units (UV trace), pH, or conductivity
- **Selection of an activity trace** — permits data collected by an offline method to be included with the BioLogic DuoFlow run data; a histogram of the offline data can overlay the chromatogram peaks

**For More Information**

Web: [www.bio-rad.com/biologicDFsoftware](http://www.bio-rad.com/biologicDFsoftware)

**System Requirements**

Operating system	Windows XP or Windows 7
Processor	Pentium 4 at 2 GHz
RAM	512 MB
Screen resolution	1,024 x 768
Hard drive space	40 GB
Drive	CD-ROM
USB port	2.0 Hi-Speed

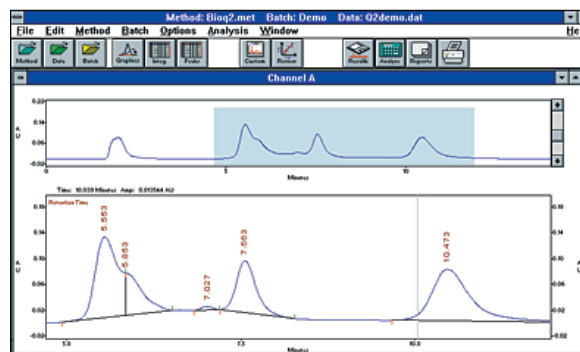
**EZLogic™ Integration Software**

Order Info: Pg 97

This powerful software package provides all the tools necessary to quantitate samples, integrate and overlay chromatograms, determine retention times, view the results, and generate customized reports. Graphical capabilities include split-screen chromatogram views, zooming, multiple parameter annotation, and color selection.

**For More Information**

Web: [www.bio-rad.com/EZlogic](http://www.bio-rad.com/EZlogic)



EZLogic integration software screen.

**BioLogic DuoFlow™ IQ/OQ Protocols**

Bio-Rad offers qualification protocols and services for the BioLogic DuoFlow chromatography systems and their peripheral components including the BioLogic Maximizer™ valve system for buffer blending, the BioLogic QuadTec™ UV/Vis detector, and the BioFrac™ fraction collector. Bio-Rad's IQ/OQ protocols are designed to help comply with U.S. FDA regulatory requirements. Procedures are performed by factory-trained and certified technicians using instruments and reagents traceable to NIST standards.

IQ service verifies that the BioLogic DuoFlow chromatography system is properly installed. OQ service tests the performance of the installed system and provides a record that confirms critical functions and safety features.

For more information on IQ/OQ for the BioLogic DuoFlow chromatography system, contact your local Bio-Rad sales representative.

**BioLogic™ Rack**

Order Info: Pg 97

The BioLogic rack is an adaptable racking system made of durable solvent-resistant polypropylene, stainless steel, and glass-filled nylon. In addition to supporting a range of chromatography systems it supports a range of columns and cartridges, valves, detection modules, buffer bottles, and peripheral equipment such as the Model 2110 fraction collector. A BioLogic rack expansion kit and optional rack components are available for custom racking applications.

**For More Information**

Web: [www.bio-rad.com/medpressurecomponents](http://www.bio-rad.com/medpressurecomponents)



BioLogic rack with optional expansion kit. Dimensions are 34 x 41 x 64 cm (W x D x H).



**New C-96 Autosampler**

Order Info: Pg 97

The C-96 Autosampler, with optional Peltier cooling, connects with the BioLogic DuoFlow™ chromatography system to provide automated sample injections. Easy-to-install accessories allow injection volumes from 5 µl to 5 ml. Three injection modes with programmable sample and reagent mixing make the C-96 a versatile autosampler.

- Easy to connect to the BioLogic DuoFlow chromatography system
- Simple programming via front panel user interface
- Automated, highly reproducible injection of sample volumes from 5 µl–5 ml

**For More Information**Web: [www.bio-rad.com/c96](http://www.bio-rad.com/c96)

## Fraction Collectors

**Model 2110 Fraction Collector**

Order Info: Pg 98

This easy-to-use fraction collector provides multiple collection modes for chromatographic separations. Key features include:

- Time or drop collection modes (or volume collection mode when connected to the Model EP-1 Econo™ pump, BioLogic™ LP system, or BioLogic DuoFlow™ system)
- Collection of 1 drop (~50 µl) to 9 ml fractions in 80 test tubes or microtubes (with optional adaptor)
- Small (Econo-Column®) chromatography columns can be mounted to drop-forming arm to minimize dead volume
- Manual-advance tube changes
- Coldroom compatibility
- Small footprint of 24 x 33 cm
- Meets IEC 61010 and CSA 22.2 certification

**For More Information**Web: [www.bio-rad.com/model2110](http://www.bio-rad.com/model2110)

**BioFrac™ Fraction Collector**

Order Info: Pg 98

Easy to program, the BioFrac fraction collector can be used for basic or complex fraction collection schemes at flow rates  $\leq 100$  ml/min. Off-the-shelf racks extend the versatility of collection schemes and provide cost-effective storage of samples. Off-the-shelf racks are autoclavable, easy to assemble, and lie flat, using little storage space. Key features include:

- Collection in time or drop mode (or volume mode when connected to a BioLogic DuoFlow™ system, BioLogic™ LP system, or Model EP-1 Econo™ pump)
- Collection of peaks by peak detection, time windows (up to 20), or a combination of both
- Drop arm movement in column, row, or serpentine pattern movements for microplates or Titertube® tubes
- A dispenser arm that is manually adjustable to tube heights  $\leq 150$  mm
- Numerous off-the-shelf racks to accommodate tubes (12–20 mm diameter), Eppendorf or other microtubes (0.5, 1.5, or 2.0 ml), or scintillation vials
- Multirun feature that allows overlay of fractions
- Optional BioFrac ice bath/microplate rack with tube grips that can hold 13 mm tubes
- Optional BioFrac prep-20 preparative rack with up to 20 collection ports for collection from bottles to carboys
- Optional microplate drophead kit for precise collection of small volumes into microplates
- IEC 61010 and CSA 22.2 certification

**For More Information**Web: [www.bio-rad.com/biofrac](http://www.bio-rad.com/biofrac)

Request or download bulletin: 2711



**Flexible rack options.** The ice bath/microplate rack is used to collect fractions in chilled test tubes (A) or up to four microplates (B) (shown using the optional 25  $\mu$ l drophead). The prep adaptor rack (C) is used for preparative fractionation into 1–20 collection vessels of any size. The BioFrac fraction collector holds up to four H4-high racks (D). The BioFrac fraction collector accepts a variety of off-the-shelf racks.



## Chromatography Cables, Fittings, and Tubing

<b>Cables</b>	<b>Order Info: Pg 98</b>
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Refer to the guide to select cables to link chromatography system components together or to link components from other manufacturers to a Bio-Rad chromatography system. Numbers in the table are cable numbers.

**For More Information**  
 Web: [www.bio-rad.com/chromcft](http://www.bio-rad.com/chromcft)

**Cable Guide**

Connection From	Connection to										
	BioLogic DuoFlow™ Workstation	BioLogic™ LP System	BioLogic DuoFlow Controller	BioLogic QuadRec™ UV/Vis Detector	Non-BioLogic System Components	Non-BioLogic System Detectors	Model 2110 Fraction Collector	BioFrac™ Fraction Collector	Model EM-1 Econo™ UV Monitor	Model EP-1 Econo Pump	Econo Gradient Pump
BioLogic DuoFlow™ workstation			17, 18, 19, or 21	17, 18, 25, or 26			5	17, 18, 19, or 21		7	17, 18, 19, or 21
Model 2110 fraction collector	5	1			5				1	1	22
BioFrac™ fraction collector	17, 18, 19, or 21	3, 15			*	*				3, 15	23
Isco Retriever II collector	12								12		
Gilson FC 203 fraction collector		14								14	
GE Healthcare FRAC-100 fraction collector		9								9	
Model EG-1 Econo™ gradient monitor					7						
Model EM-1 Econo* UV monitor						4			3		
Model EP-1 Econo pump	7				7		1	3, 15	3		
Econo gradient pump	17, 18, 19, or 21						22	23			

\* For replacement of the Model 2128 accessory cable, order the BioFrac™ accessory cable.

<b>Low-Pressure Tubing</b>	<b>Order Info: Pg 99</b>
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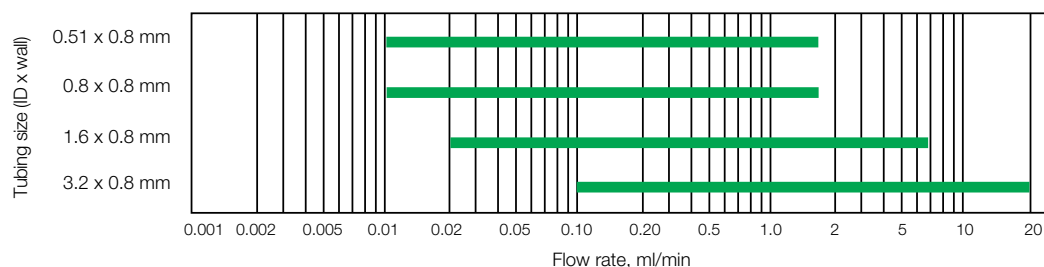
- **Silicone tubing** — contains no cytotoxic extractables and has excellent wetting properties. Autoclavable and heatable for pyrogen removal. May be damaged by concentrated acids and bases
- **Tygon tubing** — clear and tough, will tolerate greater pressures than silicone; transparent; should not be autoclaved; may be damaged by high concentrations of alcohol
- **PharMed tubing** — has a wider range of chemical compatibility than silicone or Tygon and is ideal for use in pumpheads of the Model EP-1 Econo™ pump, Econo gradient pump, and BioLogic™ LP system; lasts 10 times longer than Tygon or silicone

- **Teflon tubing** — chemically inert; can be used with virtually any reagent, is stable up to 400°C

**Pump Tubing Kits**

Precut tubing for the Model EP-1 Econo pump, Econo gradient pump, and BioLogic LP system is available in PharMed and silicone with a choice of 0.8, 1.6, or 3.2 mm ID. Each kit contains 20 pieces of precut pump tubing and four sets of luer fittings and tubing retainers.

### Tubing Size Selection Chart



**Tubing size selection.** Comparison of flow rate ranges of various tubing sizes (ID) when used in the Econo™ gradient pump, the Model EP-1 Econo pump, and the BioLogic™ LP system.

### Tubing Material Comparison

	Silicone	Tygon	PharMed	Teflon
Appearance	Translucent	Clear	Off-white	Translucent
Flexibility	Excellent	Excellent	Excellent	Fair
Autoclavability	Yes	No	Yes	Yes
Chemical compatibility	Fair	Fair	Good	Excellent
Performance in peristaltic pumps	Good	Fair	Excellent	Not acceptable

### High-Pressure Tubing and Tubing Kits

Order Info: Pg 99

- **Teflon FEP tubing** — recommended for pre-pump connections; can withstand medium pressure; translucent, semiflexible, chemically inert, and autoclavable
- **Tefzel or PEEK tubing** — recommended for post-pump connections; both withstand high pressure and are chemically inert and autoclavable. Tefzel is translucent and slightly flexible. PEEK is opaque; the color indicates the inside diameter
- **Tubing kits** — set of premade tubing with fittings to simplify setup of the BioLogic DuoFlow™ system

### Medium- and High- Pressure Fittings

Order Info: Pg 100

The BioLogic DuoFlow™ fittings kit includes all parts necessary to connect high- and medium-pressure columns to medium-pressure chromatography systems.

**For More Information**

Request or download bulletin: [column connection instructions — 5326](#)

### Low-Pressure Fittings

Order Info: Pg 101

The low-pressure system fittings kit is useful to adapt various tubing sizes, to make liquid connections, and to direct and stop liquid flow.

**For More Information**

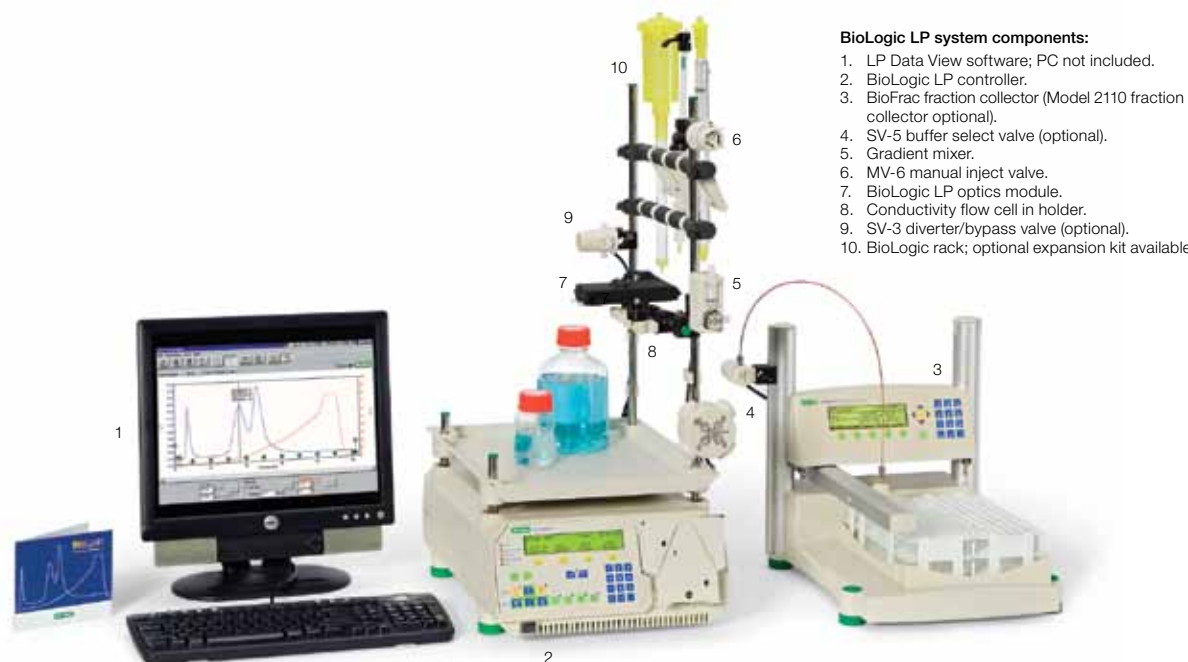
Request or download bulletin: [column connection instructions — 5326](#)

## Low-Pressure Systems

Bio-Rad offers a range of low pressure systems and components for protein purification, capable of operating at 30–45 psi (2–3.4 bar) with flow rates ranging from 0.002 to 40 ml/min.

### BioLogic™ LP Systems

Order Info: Pg 102



#### BioLogic LP system components:

1. LP Data View software; PC not included.
2. BioLogic LP controller.
3. BioFrac fraction collector (Model 2110 fraction collector optional).
4. SV-5 buffer select valve (optional).
5. Gradient mixer.
6. MV-6 manual inject valve.
7. BioLogic LP optics module.
8. Conductivity flow cell in holder.
9. SV-3 diverter/bypass valve (optional).
10. BioLogic rack; optional expansion kit available.

The BioLogic LP low-pressure chromatography system offers high performance, versatility, ease of use, and affordability. Its compact design minimizes the workspace required in the coldroom or on the laboratory bench. The BioLogic LP system includes features such as:

- **LP Data View™ software** — easy to use software designed for the BioLogic LP system; the software captures data, multitasks, and prints data from any computer that runs Windows XP or Windows 7 operating systems; requires use of one serial port
- **Methods storage** — the system stores up to 50 methods; each method can include up to 50 pump steps and 50 fraction collection steps
- **Buffer selection** — select up to 5 buffers and completely automate sample separation with the addition of an SV-5 buffer select valve; the valve can also be used to automatically load large sample volumes
- **Detection capabilities** — the system includes both 254 and 280 nm filters for nucleic acid and protein detection and a conductivity cell to monitor gradient progress

- **A high-flow pump** — the system houses a peristaltic pump with a flow rate range of 0.05–40 ml/min (20 ml/min per channel; dual-channel peristaltic pump) and maximum backpressure of 30 psi (0.2 MPa); the system is compatible with Econo-Column® low-pressure chromatography columns, Bio-Rad chromatography media, GE Healthcare HiTrap cartridges, SOURCE media, and all other low-pressure chromatography media
- **Fraction collection** — the system offers both simple and sophisticated fraction collection choices: collect into eighty 13 x 100 mm tubes or micro tubes using the Model 2110 fraction collector (page 84), or collect into virtually any size container, from microplates to carboys, using the BioFrac™ fraction collector (page 85); in addition, the BioLogic LP system supports the use of other fraction collectors
- **IEC 61010 safety certification**

#### For More Information

Web: [www.bio-rad.com/biologiclp](http://www.bio-rad.com/biologiclp)

Request or download bulletins: system information — 2038 and 2327; column connection instructions — 5326

**BioLogic™ LP Data View™ Software**

Order Info: Pg 102

BioLogic LP Data View software allows complete freedom to rescale chromatogram axes both during and after a run, to multitask during chromatogram data capture, and to print using any dedicated or networked printer.

LP Data View software:

- Runs on Windows XP or Windows 7 operating systems; requires use of one serial or USB port
- Automatically records method information for each run and allows notes to be recorded with data

- Automatically records run events such as Start, End, Fraction Advance, Hold, Pause, and Continue
- Prints customized reports
- Exports data to other applications

**For More Information**

Web: [www.bio-rad.com/biologiclp](http://www.bio-rad.com/biologiclp)  
Request or download bulletin: 2038

**BioLogic™ LP Valves**

Order Info: Pg 102

Bio-Rad offers three valve options for the BioLogic LP system.

**Buffer Selection and Automated Sample Loading Valve**

The optional SV-5 buffer select valve expands the preparative purification capabilities of the BioLogic LP system, allowing it to control up to five buffers and to automatically inject large-volume samples. The SV-5 valve attaches directly to the BioLogic rack and is controlled by the BioLogic LP system.

**Manual Sample Injection Valve**

The MV-6 injection valve has six ports with female luer fittings. It accommodates user-made loops of any volume. The MV-6 valve mounts directly on the BioLogic system rack and the Econo™ gradient pump rack.

**Fraction Collection/Column Bypass Valve**

The optional SV-3 diverter/bypass valve is a two-position solenoid valve controlled through the Econo™ gradient pump, the Model EP-1 Econo pump, or the BioLogic LP system. When connected to the BioLogic LP system, the SV-3 valve directs effluent flow from the column to a bypass position, or from the fraction collector to a waste



position. The function of the valve is determined by the mini-DIN connection on the rear of the instrument and by the plumbing of the valve. When connected to either the Model EP-1 Econo pump or the Econo gradient pump, the SV-3 valve functions only as a fraction collector diverter valve. The SV-3 valve connects directly to the BioLogic system rack and the Econo gradient pump rack.

**Econo™ Gradient Pump**

Order Info: Pg 102

The Econo gradient pump is suited for any low-pressure protein purification application. It is the only stand alone peristaltic pump capable of both isocratic and gradient elution. The Econo gradient pump works seamlessly with other Bio-Rad instruments such as the Model 2110 and BioFrac™ fraction collectors, the EM-1 UV monitor, and the EG-1 gradient monitor. Configure the system according to your needs and budget using the Econo gradient pump as a starting point.

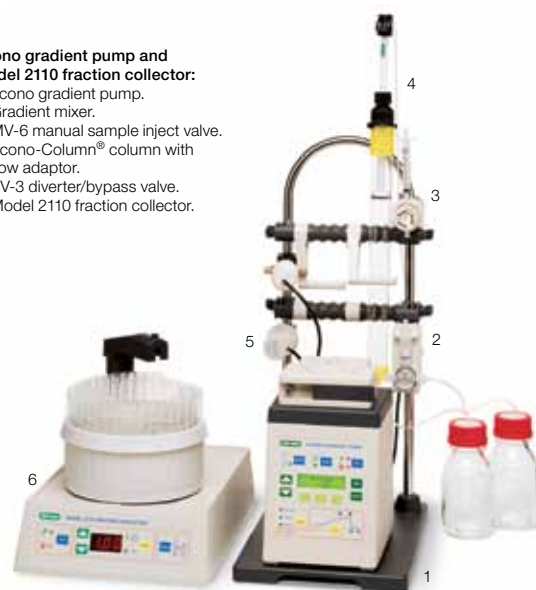
The Econo gradient pump is a two-channel bidirectional pump that is ideal for preparative applications and for purification of recombinant proteins.

- Simple setup and programming
- Flow rates of 0.1– 40 ml/min
- Control of a gradient mixer for binary gradient formation
- Control of an optional fraction collector and diverter valve
- Automated calibration procedures for a variety of tubing sizes
- Maximum pressure of 30 psi
- Compatible with the BioLogic DuoFlow™ chromatography systems

**For More Information**Web: [www.bio-rad.com/econogradient](http://www.bio-rad.com/econogradient)

Request or download bulletin: 2438

**Econo gradient pump and Model 2110 fraction collector:**  
1. Econo gradient pump.  
2. Gradient mixer.  
3. MV-6 manual sample inject valve.  
4. Econo-Column® column with flow adaptor.  
5. SV-3 diverter/bypass valve.  
6. Model 2110 fraction collector.

**Model EP-1 Econo™ Pump**

Order Info: Pg 103

The Model EP-1 Econo pump is a two-channel, bidirectional, variable speed peristaltic pump for low pressure chromatography or for general laboratory delivery of liquids. The pump works in conjunction with the Model 2110 fraction collector to make your isocratic purification needs simple.

- Simple setup and programming
- Flow rates of 0.1–40 ml/min
- Control of an optional fraction collector and diverter valve
- Maximum pressure of 30 psi
- Compatible with the BioLogic DuoFlow™ chromatography systems

**For More Information**Web: [www.bio-rad.com/modelep1](http://www.bio-rad.com/modelep1)

**Model EM-1 Econo™ UV Monitor**

Order Info: Pg 103

The Model EM-1 Econo UV monitor is a single-wavelength detector for flowthrough monitoring of effluents from chromatographic columns, centrifugation gradients, and other devices. The monitor consists of a control unit and an optics module that includes both 254 and 280 nm filters and a 2 mm pathlength flow cell.

- Portable optics module with detection close to the column outlet to maximize resolution
- Autozeroing function
- Coldroom compatibility
- LED display of absorbance



**Specifications**

Wavelength	254 and 280 nm	Noise	1.0 x 10 <sup>-4</sup> OD max. peak-to-peak (dry cell); 2.0 x 10 <sup>-4</sup> OD max. peak-to-peak (flowing liquid)
Sensitivity ranges	2.0, 1.0, 0.5, 0.2, 0.1, 0.05, 0.02, 0.01 AUFS	Safety	Meets IEC 61010 and CSA 22.2 certification
Detection limit	7 µg/ml (BSA in H <sub>2</sub> O)	Dimensions (W x D x H)	Base unit: 14.6 x 18.6 x 20.2 cm Optics unit: 13.2 x 15.2 x 3.8 cm
Lamp	Low-pressure mercury with phosphor screen		
Filters	254 and 280 nm		
Output signal	0–1 V analog (impedance 150 Ω)		
Operating temperature	4–40°C		
Flow cell	Optical path 2 mm, internal volume 80 µl, illuminated volume 3 µl		

**For More Information**

Web: [www.bio-rad.com/modelem1](http://www.bio-rad.com/modelem1)

**Model EG-1 Econo™ Gradient Monitor**

Order Info: Pg 103

Conductivity monitoring is essential in optimizing protein purification methods and confirming the efficiency of chromatographic separations.

**Specifications**

Operating mode	Conductivity, in Siemens
Sensitivity ranges (full scale)	0–10 µS, 0–100 µS, 0–10 mS
<b>Dimensions</b>	
Control unit (W x L x H)	15.60 x 22.86 x 8.89 cm
Flow cell	3.1 cm diameter by 3.8 cm length
<b>Flow Cell</b>	
Type	Flow through, externally mounted
Temperature compensation	0–60 µC
Internal volume	8 µl, swept volume
Maximum operating pressure	60 psi, 4 bar, or 0.41 mPa
Fittings	Removable luer (will also accept 1/4"–28 flat bottom fittings)



**For More Information**

Web: [www.bio-rad.com/modelegt1](http://www.bio-rad.com/modelegt1)



### Profinia™ Automated Protein Purification System

Order Info: Pg 103

The Profinia protein purification system is a compact, easy-to-use, automated liquid chromatography system for the purification and desalting of affinity-tagged proteins and antibodies. The design allows you to set up quickly, walk away, and come back to results in as little as 30 minutes.

- Optimized preprogrammed methods, cartridges, and buffer kits eliminate time spent on method development, troubleshooting, and reagent preparation
- Built-in reproducibility is achieved with automated system pumps, UV and conductivity detectors, and programmed cleaning methods
- Histidine (His)-tagged, GST-tagged, affinity, and desalting/buffer exchange methods deliver purity and yield in a fraction of the time required for other techniques
- Automatic UV peak detection diverts eluted target protein from cartridges to a fraction collection tube for unattended operation
- Fraction collection and sample compartments hold 15 or 50 ml conical collection tubes
- Benchtop or coldroom compatible. Optional cooling accessory keeps samples and fractions cold for benchtop operation
- Optional pH monitor



**Profinia instrument components:**

1. Buffer compartment.
2. Sample compartment.
3. Diluent bottle.
4. Fraction collection compartment.
5. Stylus and USB flash drive slots.
6. Waste collection bottle.
7. Cartridge compartment.
8. Touch-screen user interface.

**For More Information**

Web: [www.bio-rad.com/profinia](http://www.bio-rad.com/profinia)

Request or download bulletins: 5541 and 5626; for specific methods — 5513, 5514, 5712, 5741, 5744, 5766, and 5770

**Summary of Methods and Materials Available for Profinia System Preprogrammed Purifications**

Bio-Rad Method	Bio-Scale™ Mini Prepacked Cartridge	Profinia Buffer Kit
Native IMAC	Profinia™ IMAC	Native IMAC purification or buffer kit
Native IMAC with desalting	Profinia IMAC and Bio-Gel® P-6 desalting	Native IMAC purification or buffer kit
Denaturing IMAC	Profinia IMAC	Native IMAC purification or buffer kit plus urea
GST	Profinia GST	GST purification or buffer kit
GST with desalting	Profinia GST and Bio-Gel P-6 desalting	GST purification or buffer kit
Desalting	Bio-Gel P-6 desalting	Desalting and cartridge cleaning buffer kit
Proteins A and G	Affi-Prep® protein A or UNOsphere SUPra™	See bulletin 5701 for buffer recommendations
Proteins A and G with desalting	Affi-Prep protein A and Bio-Gel P-6 desalting	See bulletin 5701 for buffer recommendations
Profinia eXact™	Profinia eXact	See bulletin 5725 for buffer recommendations
Profinia eXact with desalting	Profinia eXact and Bio-Gel P-6 desalting	See bulletin 5725 for buffer recommendations

**Profinia™ Software, Version 2.0**

Order Info: Pg 103

Profinia software, compatible with Windows XP, Windows Vista, and Windows 7, offers a convenient way to review purification results. Features include:\*

- **Stand-alone data evaluation** — transfer data via a USB flash drive or USB cable connection to any stand-alone PC loaded with Profinia software; evaluate the run results, samples, run logs, and lot and method information in a convenient format
- **Real-time data acquisition** — monitor and record real-time data simply by connecting the Profinia instrument to a computer with a USB cable
- **Customizable chromatograms** — choose traces to analyze or to monitor; customize trace color and width as well as chromatogram size, view UV traces on separate or merged axes, and zoom into regions of interest
- **Standard reports** — preview and print Profinia standard reports, which include summary information such as run information (start of run, duration, versions, username), result information, sample-specific results (total protein, concentration, loaded volumes), and corresponding chromatogram images
- **Custom reports** — select from a range of report elements, place them in any order, add comments, and preview before printing; in addition, custom reports can be saved to “Favorites” and viewed and printed directly from the toolbar
- **Trace Compare** — with automatic layout suggestions, compare up to 10 runs at a time
- **Trace Overlay** — overlay traces of different runs

\* Profinia software does not run or control the Profinia instrument.

**For More Information**

Web: [www.bio-rad.com/profinia](http://www.bio-rad.com/profinia)

Request or download bulletin: 5544

**Profinia™ Accessories**

Order Info: Pg 103

- **Profinia instrument accessory kit** — plasticware to operate and complete purification runs; includes buffer bottles (125 and 250 ml) with lids, waste and diluent bottles, a cleaning tray, an inline filter pack, and 15 and 50 ml sample tube lids
- **Profinia pH monitor kit** — enables real-time monitoring of pH conditions during a sample run; connected via a standard pH probe connector, the kit includes the pH probe, flow cell, and all tubing and accessories required to connect to the Profinia system. pH monitoring is fully supported by the Profinia system and optional Profinia software
- **Profinia instrument cooling accessory** — allows you to work with temperature-sensitive proteins for sample loading and collection without having to work in a coldroom or use a refrigeration unit. Just fill the accessory with water, and freeze it until it's ready to use. The accessory can maintain precooled samples and fractions at 2–8°C for 5–6 hours at 20°C room temperature with the instrument powered up and operating
- **Profinia desalting sample loops** — desalting methods are designed for rapid desalting or buffer exchange applications and require that a desalting loop accessory be used in conjunction with a desalting cartridge. A syringe and three-way stopcock combination is used to fill the desalting loop, which is available in 2 and 10 ml sizes. Luer fittings allow easy installation onto the Profinia instrument



Profinia Instrument Accessory Kit

- **Profinia sipper tube replacement kit** — sipper tubes are used in the buffer and sample inlet compartments. The replacement kit includes ten pieces of precut, 13.5 cm (5.3") long, chemically compatible polypropylene tubing
- **Profinia instrument inline filter pack** — consists of 12 filters and is a necessary part of the Profinia system's general maintenance regimen. The instrument inline filter should be replaced at regular intervals to keep the system running at its optimal level
- **Bottle starter pack** — includes 4 x 125 ml buffer bottles, 4 x 250 ml buffer bottles, and 8 buffer bottle lids

## Chromatography Systems and Accessories

## Medium-Pressure Systems

Catalog # Description

## BioLogic DuoFlow Systems

Pg 77

## BioLogic DuoFlow Systems\*

760-0037	<b>BioLogic DuoFlow 10 System</b> , 100/120 V, includes Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, UV detector with 5 mm flow cell and 254/280 nm filters, conductivity monitor, starter kit
760-0036	<b>BioLogic DuoFlow 10 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-0038	<b>BioLogic DuoFlow 10 System</b> , 220/240 V, does not include monitor
760-4037	<b>BioLogic DuoFlow 40 System</b> , 100/120 V, same as 760-0037 with F40 workstation replacing F10 workstation
760-4036	<b>BioLogic DuoFlow 40 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-4038	<b>BioLogic DuoFlow 40 System</b> , 220/240 V, does not include monitor
760-0047	<b>BioLogic DuoFlow 10 System with BioFrac Fraction Collector</b> , 100/120 V, includes Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, UV detector with 5 mm flow cell and 254/280 nm filters, conductivity monitor, starter kit, diverter valve, two F1 racks
760-0046	<b>BioLogic DuoFlow 10 System with BioFrac Fraction Collector</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-0048	<b>BioLogic DuoFlow 10 System with BioFrac Fraction Collector</b> , 220/240 V, does not include monitor
760-4047	<b>BioLogic DuoFlow 40 System with BioFrac Fraction Collector</b> , 100/120 V, same as 760-0047 with F40 workstation replacing F10 workstation
760-4046	<b>BioLogic DuoFlow 40 System with BioFrac Fraction Collector</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-4048	<b>BioLogic DuoFlow 40 System with BioFrac Fraction Collector</b> , 220/240 V, does not include monitor

## BioLogic DuoFlow QuadTec Systems\*

760-1137	<b>BioLogic DuoFlow QuadTec 10 System</b> , 100/120 V, includes Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, BioLogic QuadTec UV/Vis detector with 3 mm PEEK flow cell, instrument control module (ICM), system cables 25 and 26 (RS-232 and ICM power), conductivity monitor, starter kit
760-1136	<b>BioLogic DuoFlow QuadTec 10 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-1138	<b>BioLogic DuoFlow QuadTec 10 System</b> , 220/240 V, does not include monitor
760-4137	<b>BioLogic DuoFlow QuadTec 40 System</b> , 100/120 V, same as 760-1137 with F40 workstation replacing F10 workstation
760-4136	<b>BioLogic DuoFlow QuadTec 40 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-4138	<b>BioLogic DuoFlow QuadTec 40 System</b> , 220/240 V, does not include monitor
760-1147	<b>BioLogic DuoFlow QuadTec 10 System with BioFrac Fraction Collector</b> , 100/120 V, includes Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, BioLogic QuadTec UV/Vis detector with 3 mm PEEK flow cell, instrument control module (ICM), system cables 25 and 26 (RS-232 and ICM power), conductivity monitor, starter kit, diverter valve, two F1 racks
760-1146	<b>BioLogic DuoFlow QuadTec 10 System with BioFrac Fraction Collector</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-1148	<b>BioLogic DuoFlow QuadTec 10 System with BioFrac Fraction Collector</b> , 220/240 V, does not include monitor
760-4147	<b>BioLogic DuoFlow QuadTec 40 System with BioFrac Fraction Collector</b> , 100/120 V, same as 760-1147 with F40 workstation replacing F10 workstation
760-4146	<b>BioLogic DuoFlow QuadTec 40 System with BioFrac Fraction Collector</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-4148	<b>BioLogic DuoFlow QuadTec 40 System with BioFrac Fraction Collector</b> , 220/240 V, does not include monitor

## BioLogic DuoFlow Maximizer Systems\*

760-2237	<b>BioLogic DuoFlow Maximizer 20 System</b> , 100/120 V, includes BioLogic Maximizer base unit, BioLogic Maximizer mixer, pH monitor, Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, UV detector with 5 mm flow cell and 254/280 nm filters, conductivity monitor, starter kit, BioFrac fraction collector, diverter valve, two F1 racks
760-2236	<b>BioLogic DuoFlow Maximizer 20 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-2238	<b>BioLogic DuoFlow Maximizer 20 System</b> , 220/240 V, does not include monitor
760-2247	<b>BioLogic DuoFlow Maximizer 80 System</b> , 100/120 V, same as 760-2237 with F40 workstation replacing F10 workstation
760-2246	<b>BioLogic DuoFlow Maximizer 80 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-2248	<b>BioLogic DuoFlow Maximizer 80 System</b> , 220/240 V, does not include monitor

\*The 10 and 20 systems include an F10 workstation; the 40 and 80 systems include an F40 workstation.

Catalog #	Description
<b>BioLogic DuoFlow Pathfinder Systems*</b>	
760-2257	<b>BioLogic DuoFlow Pathfinder 20 System</b> , 100/120 V, includes BioLogic Maximizer base unit, BioLogic Maximizer mixer, pH monitor, Dell controller and monitor, USB Bitbus communicator, F10 workstation, MX-1 mixer, 3-tray rack, AVR7-3 sample inject valve, fittings kit, BioLogic QuadTec UV/Vis detector with 3 mm PEEK flow cell, system cable 25 (RS-232), conductivity monitor, starter kit, BioFrac fraction collector, diverter valve, two F1 racks
760-2256	<b>BioLogic DuoFlow Pathfinder 20 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-2258	<b>BioLogic DuoFlow Pathfinder 20 System</b> , 220/240 V, does not include computer monitor
760-2267	<b>BioLogic DuoFlow Pathfinder 80 System</b> , 100/120 V, same as 760-2257 with F40 workstation replacing F10 workstation
760-2266	<b>BioLogic DuoFlow Pathfinder 80 System</b> , 100/120 V, for Japan and Korea only, does not include monitor
760-2268	<b>BioLogic DuoFlow Pathfinder 80 System</b> , 220/240 V, does not include monitor

\*The 10 and 20 systems include an F10 workstation; the 40 and 80 systems include an F40 workstation.

### BioLogic DuoFlow Workstations and Accessories

Pg 79

#### BioLogic DuoFlow Workstations

760-0150	<b>BioLogic DuoFlow F10 Workstation</b>
760-0140	<b>BioLogic DuoFlow F40 Workstation</b>

#### Pump Kits

760-0110	<b>F10 Pump Kit</b> , converts F40 workstation to F10 pumps to enable flow rates as low as 0.01 ml/min; includes 2 fully assembled pumpheads, 4 piston assemblies, F10 tubing kit, tools
760-0180	<b>F40 Pump Kit</b> , expands pumping capabilities to 40 ml/min; includes 2 fully assembled pumpheads, 4 piston assemblies, mixer barrel extender, 2 mm UV flow cell, F40 tubing kit, tools

#### Mixers

760-0170	<b>MX-1 Mixer</b> , includes mixer body (263 µl) and standard mixer barrel for total volume of 750 µl
760-0171	<b>Mixer Barrel Extender</b> , for total volume of 2 ml; one included in the F40 pump kit (760-0180)
760-2010	<b>BioLogic Maximizer Mixer</b> , includes 750 µl mixer body, 5 ml and 12 ml mixer barrel extenders, 5 O-rings, stirbar, installation screws
760-2005	<b>BioLogic Maximizer Mixer Barrel Extender</b> , 5 ml
760-2012	<b>BioLogic Maximizer Mixer Barrel Extender</b> , 12 ml

#### BioLogic DuoFlow Workstation Accessories

760-0164	<b>F10 Pump Maintenance Kit</b> , to service one F10 pump, includes 2 piston seals, 4 check valves, seal removal tool, 2 O-rings
760-0161	<b>F10 Piston Seals</b> , 2, includes seal tool, to service one F10 pump
760-0162	<b>F10 Piston Kit</b> , 2 pistons, to service one F10 pump
760-0184	<b>F40 Pump Maintenance Kit</b> , to service one F40 pump, includes 2 piston seals, 4 check valves, seal removal tool, 2 O-rings
760-0172	<b>F40 Piston Seals</b> , 2, includes seal tool, to service one F40 pump
760-0173	<b>F40 Piston Kit</b> , 2 pistons, to service one F40 pump
750-0162	<b>Check Valve</b> , 1 (4 required per pump)
750-0703	<b>Inline Filter Kit</b> , includes 1 filter unit, 2 replacement frits
750-0230	<b>40 psi Backpressure Regulator</b>
760-0135	<b>BioLogic System Starter Kit</b>

### BioLogic Maximizer Valve System

Pg 79

760-2200*	<b>BioLogic Maximizer Kit</b> , 100/120 V, for US, Japan, Korea; includes BioLogic Maximizer base unit, pH monitor, BioLogic Maximizer mixer, starter kit, tubing kit, system cable 30, U.S. power cord
760-2204*	<b>BioLogic Maximizer Kit</b> , 220/240 V, includes BioLogic Maximizer base unit, pH monitor, BioLogic Maximizer mixer, starter kit, tubing kit, system cable 30
760-2000	<b>BioLogic Maximizer Base Unit</b>

#### Mixer and Mixer Barrel Extenders

760-2010	<b>BioLogic Maximizer Mixer</b> , includes 750 µl mixer body, 5 ml and 12 ml mixer barrel extenders, 5 O-rings, stirbar, installation screws
760-2005	<b>BioLogic Maximizer Mixer Barrel Extender</b> , 5 ml
760-2012	<b>BioLogic Maximizer Mixer Barrel Extender</b> , 12 ml

#### BioLogic Maximizer Accessories

760-2002	<b>BioLogic Maximizer Tubing Kit</b> , includes 4 FEP Teflon prefitted tubing lengths for connection of solvent vials to the BioLogic Maximizer mixer; color coding indicates buffer solution
760-2003	<b>BioLogic Maximizer Interconnect Tubing</b> , includes 2 PEEK prefitted tubing lengths for connection of BioLogic DuoFlow pumps to the BioLogic Maximizer valve system

\* BioLogic Maximizer upgrades require BioLogic DuoFlow version 4.0 (or higher) software. The BioLogic DuoFlow workstation may require a firmware upgrade; for information, contact your local Bio-Rad sales representative.

Catalog #	Description	
<b>BioLogic DuoFlow Detectors</b>		<b>Pg 80</b>
750-0200	<b>BioLogic DuoFlow Detector Kit</b> , includes UV optics module and conductivity monitor, 5 mm analytical flow cell	
750-0202	<b>UV Optics Module</b> , 5 mm analytical flow cell	
750-0240	<b>Conductivity Monitor</b>	
750-0210	<b>Flow Cell</b> , preparative, 2 mm (30 ml) pathlength	
750-0212	<b>Flow Cell</b> , analytical, 5 mm (16 ml) pathlength	
750-0216	<b>Mercury Lamp</b> , for use at all wavelengths except 214 nm	
750-0220	<b>Detector Filters</b> , 254 and 280 nm	
750-0223	<b>Detector Filter</b> , 365 nm	
750-0224	<b>Detector Filter</b> , 405 nm	
750-0225	<b>Detector Filter</b> , 436 nm	
750-0214	<b>214 nm Conversion Kit</b> , for detectors with serial #362BRXXXX, includes zinc lamp, housing, and 214 nm filter for peptide detection	
750-0217	<b>Zinc Lamp</b> , for 214 nm detection	
750-0221	<b>Detector Filter</b> , 214 nm, requires zinc lamp	
760-1300	<b>BioLogic QuadTec Detector Kit</b> , includes BioLogic QuadTec detector with 3 mm PEEK flow cell, instrument control module (ICM), system cables 25, 26, and 17 (BioLogic QuadTec RS-232, ICM power, and bus communication), U.S. power cord, 40 psi backpressure regulator	
760-1330	<b>Deuterium Lamp</b> , replacement	
760-1332	<b>Halogen Lamp</b> , replacement	
760-1331	<b>Halogen Lamp</b> , with holder for first-time halogen lamp change	
760-1306	<b>Standard Flow Cell</b> , 3 mm pathlength (2 µl)	
760-1406	<b>High-Speed Flow Cell</b> , 2 mm pathlength, flow rate to 80 ml/min with fittings	
760-1311	<b>Long Fingertight Fittings</b> , 10-32 x 1.03", 4	
760-1320	<b>Instrument Control Module (ICM) Kit</b> , includes ICM power cable and cable 17	
750-0650	<b>System Cable 17</b> , bus communication cable, 1.2 m (4')	
760-1309	<b>System Cable 24 (BioLogic QuadTec Analog)</b> , includes 2 cables, connects BioLogic QuadTec detector to SIM	
760-1307	<b>System Cable 25 (BioLogic QuadTec RS-232)</b> , connects BioLogic QuadTec detector to ICM	
760-1321	<b>System Cable 26 (ICM Power)</b> , connects to 12 V power on BioLogic DuoFlow workstation	
750-0230	<b>40 psi Backpressure Regulator</b>	
760-1301	<b>BioLogic QuadTec Instruction Manual</b>	
<b>BioLogic DuoFlow pH Monitor</b>		
760-2040	<b>BioLogic DuoFlow pH Monitor</b> , includes SIM module, pH electrode, flow cell, and tubing	
760-2042	<b>pH Electrode</b>	
760-2044	<b>Flow Cell</b>	
760-2046	<b>pH Tubing Kit</b> , includes orange and green PEEK 1/4–28 prefitted tubing lengths for connection of the pH flow cell to the chromatography system	
<b>Signal Import Module (SIM)</b>		
750-0502	<b>Signal Import Module</b> , includes 4' communication cable (system cable 17)	
760-2034	<b>Universal AC/DC Inline Adaptor for USB Bitbus Device</b> , required when connecting pH monitor or other external detector through SIM module on BioLogic DuoFlow systems	
<b>BioLogic DuoFlow Valves and Accessories</b>		<b>Pg 81</b>
<b>BioLogic DuoFlow Valves and Rebuild Kits</b>		
760-0406	<b>AVR7-3 Automated Sample Injection Valve</b> , 7-port, 3-position high-pressure valve, 3,500 psi (233 bar) limit	
760-0401	<b>AVR7-3 Valve Rebuild Kit</b>	
760-0408	<b>AVR9-8 Stream-Select Valve</b> , 9-port, 8-position high-pressure valve, 3,500 psi (233 bar) limit	
760-0403	<b>AVR9-8 Valve Rebuild Kit</b>	
760-0410	<b>SVT3-2 Diverter Valve</b> , 3-port, 2-position solenoid valve, 30 psi (2 bar) limit	
760-0411	<b>SVT3-2 Valve Rebuild Kit</b>	
750-0415	<b>SV5-4 Select Valve</b> , 5-port, 4-position solenoid valve, 30 psi (2 bar) limit	
<b>BioLogic DuoFlow Fittings Kit</b>		
760-0550	<b>BioLogic DuoFlow Fittings Kit</b>	
<b>BioLogic Single-Injection Sample Loops, Kits, and Accessories</b>		
750-0471	<b>Sample Injection Port</b> , for use with AVR7-3 automated sample injection valve	
125-0224	<b>Injection Needle</b> , 22 gauge, blunt	
750-0490	<b>Small-Volume Sample Loop Kit</b> , includes 100, 250, and 500 µl PEEK loops	
750-0491	<b>Large-Volume Sample Loop Kit</b> , includes 1, 2, and 5 ml PEEK loops	
750-0482	<b>25 µl Tefzel Sample Loop</b>	
750-0483	<b>50 µl Tefzel Sample Loop</b>	

continues

Catalog # Description

### BioLogic Single-Injection Sample Loops, Kits, and Accessories (cont.)

750-0492	100 µl PEEK Sample Loop
750-0493	250 µl PEEK Sample Loop
750-0494	500 µl PEEK Sample Loop
750-0495	1 ml PEEK Sample Loop
750-0496	2 ml PEEK Sample Loop
750-0497	5 ml PEEK Sample Loop

### BioLogic Dynamic (Sliding Piston) Sample Loops, Kits, and Seal Replacement

750-0451	DynaLoop 25 Kit, includes 25 ml DynaLoop sliding piston loop, DynaLoop parts kit
750-0452	DynaLoop 90 Kit, includes 90 ml DynaLoop sliding piston loop, DynaLoop parts kit
750-0450	DynaLoop Parts Kit, includes 4 end cap O-rings, 1 sliding seal O-ring, 1 filter, 4 nut fittings, four 1/8" ferrules, five 1/4-28 nuts and ferrules, 10' of 1/8" Teflon tubing
750-0475	DynaLoop 25 Sample Loop, 25 ml, replacement
750-0476	DynaLoop 90 Sample Loop, 90 ml, replacement
750-0455	DynaLoop Sliding Seal Replacement

### BioLogic DuoFlow Software, Version 5.3

Pg 82

760-2050	BioLogic DuoFlow Software Version 5.3 Upgrade, upgrades existing BioLogic DuoFlow version 5.0 systems, includes version 5.3 software CD
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### EZLogic Integration Software

Pg 82

750-0111	EZLogic Integration Software Package
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### BioLogic Rack

Pg 83

750-0251	BioLogic Rack, includes rack tray, 8 sleeves, 2 short vertical bars, 2 long vertical bars, column clamp set, 5 bar clamps, 4 cable organizers
750-0268	BioLogic Rack Expansion Kit, includes 2 rack trays, 2 long vertical bars, 16 sleeves

### Accessories

750-0261	BioLogic Rack Tray, includes 1 rack tray, 8 bar sleeves
750-0262	Vertical Bars, long, 64 cm, 2
750-0263	Vertical Bars, short, 10 cm, 2
750-0264	Horizontal Bar Kit, includes 2 tie bars, 4 bar clamps
750-0260	Column Clamp Set, includes 1 column clamp assembly
750-0265	Bar Clamps, 5

### C-96 Autosampler

Pg 84

760-5010	C-96 Autosampler with Cooling, 110–240 V, includes standard 84+3 vial tray (1.5 and 10 ml), control cable set to connect with BioLogic DuoFlow system, 1 ml syringe, 2 ml sample loop; also includes catalog #760-5014, 760-5026, and 760-0604
760-5011	C-96 Autosampler, 110–240 V, includes standard 84+3 vial tray (1.5 and 10 ml), control cable set to connect with BioLogic DuoFlow system, 1 ml syringe, 2 ml sample loop; also includes catalog #760-5014, 760-5026, and 760-0604
760-5012	Prep Bio Kit, contains 24-position tray for 10 ml vials (22 mm OD), 2.5 ml syringe, 10 ml PEEK loop, 0.75 mm ID PEEK injection valve, prep needle, 6 mm fitting wrench, for use with C-96 autosamplers
760-5013	Syringe, pkg of 1, 1 ml syringe, for use with C-96 autosamplers
760-5014	Connector Kit, contains nuts and ferrules to plumb the syringe valve, for use with C-96 autosamplers
760-5024	Sample Tray, pkg of 1, large-capacity 96-position tray for 1.5 ml vials (12 mm OD), for use with C-96 autosamplers
760-0604	PEEK Tubing, pkg of 1, 1/16" OD x 0.020" ID x 30' high-pressure tubing, rated to 5,000 psi, orange
760-5026	Fittings Kit, contains 10-32 short nuts and ferrules to plumb the injection valve, for use with C-96 autosamplers
760-5027	Needle, pkg of 1, 45 µl needle, for use with C-96 autosamplers
760-5028	Prep Kit Needle, pkg of 1, needle for large sample volume, for use with C-96 autosamplers
760-5017	Analytical Bio Kit, includes 250 µl syringe, 500 µl buffer tubing, 100 and 200 µl PEEK sample loops, standard sample needle, 6 mm fitting wrench, for use with C-96 autosamplers

## Fraction Collectors

Catalog # Description

### Model 2110 Fraction Collector

Pg 84

731-8122 **Model 2110 Fraction Collector**, 100/120 V  
731-8120 **Model 2110 Fraction Collector**, 220/240 V

#### Accessories

731-8130 **Carousel**, 80-tube capacity  
731-8135 **Micro Tube Adaptor**, 80 microtube capacity  
731-8136 **Instrument Dust Cover**  
731-8131 **Replacement Drop Formers**, 2  
731-8261\* **System Cable 1**, 8-pin mini-DIN to DB-9 connector  
731-8265\* **System Cable 5**, DB-9 connector to bare wires  
731-9010\* **System Cable 22**, Y-cable connecting Econo gradient pump to Model 2110 fraction collector

#### Tubes

223-9750 **Clear Polystyrene Tubes**, 13 x 100 mm, 9 ml nominal capacity, 1,000  
223-9751 **Natural Polypropylene Tubes**, 13 x 100 mm, 9 ml nominal capacity, 1,000  
223-9500 **Micro Test Tubes**, capless, 1.5 ml, polypropylene, natural, graduated, 500

\* For more information, refer to the Cable Guide on page 86.

### BioFrac Fraction Collector

Pg 85

741-0002 **BioFrac Fraction Collector**, input voltage 100–240 V, includes power cord, rack set F1 (2 x flatpack, 13 mm), BioFrac diverter valve, fittings kit

#### Accessories

741-0010 **Rack Set F1**, 2 x flatpack, with numbered tube positions, each holds 90 tubes, 12–13 mm diameter, for total of up to 180-tube collection  
741-0011 **Rack Set F2**, 2 x flatpack, each holds 60 tubes, 15–16 mm diameter, for total of up to 120-tube collection  
741-0012 **Rack Set F3**, 2 x flatpack, each holds 40 tubes, 18–20 mm diameter, for total of up to 80-tube collection  
741-0013 **Rack Set H1**, 4 x flatpack, each holds 42 capless 1.5 ml Eppendorf/microtubes for total of up to 168-microtube collection  
741-0014 **Rack Set H2**, 4 x flatpack, each holds 63 capless 0.5 ml Eppendorf/microtubes for total of up to 252-microtube collection  
741-0015 **Rack Set H3**, 4 x flatpack, each holds 30 reduced-volume scintillation vials, 16 mm diameter, for total of up to 120-vial collection  
741-0016 **Rack Set H4**, 4 x flatpack, each holds 6 scintillation vials, 30 mm diameter, for total of up to 24-vial collection  
741-0020 **BioFrac H4-High Rack Set**, 4 x flatpack, each holds 6 centrifuge tubes, 30 mm diameter, for total of up to 24-vial collection  
741-0017 **BioFrac Ice Bath/Microplate Rack**, holds 120 tubes, 12–13 mm diameter; with the following capabilities: up to 4 SBS-format microplates in 96-, 48-, 24-, or 12-well configurations; Titer tube micro test tube collection, 8 x 12, 96-tube configuration  
741-0018 **BioFrac Prep-20 Preparative Rack**, for fractionation into 1–20 collection vessels of any size  
741-0007 **BioFrac Fraction Collector Fittings Kit**, includes replacement fittings and tubing for setup of the fraction collector to the BioLogic LP or BioLogic DuoFlow chromatography systems  
741-0088 **BioFrac Microplate Drophead Kit**, includes preassembled drophead nut with 0.020" ID Tefzel tubing; delivers approximately 25 µl per drop  
731-8263\* **System Cable 3**, 8-pin mini-DIN to 8-pin mini-DIN  
731-8286\* **System Cable 15**, 15-pin D to mini-DIN  
731-8287\* **System Cable 16**, 8-pin mini-DIN to 8-pin standard DIN  
731-8290 **BioFrac Accessory Cable**, 15-pin D to bare wires, for connecting BioFrac fraction collector to other equipment; for input or output signals  
731-9009\* **System Cable 23**, Y-cable connecting Econo gradient pump to BioFrac fraction collector

#### Tubes

223-9750 **Clear Polystyrene Tubes**, 13 x 100 mm, 9 ml nominal capacity, 1,000  
223-9751 **Natural Polypropylene Tubes**, 13 x 100 mm, 9 ml nominal capacity, 1,000  
223-9500 **Micro Test Tubes**, capless, 1.5 ml, polypropylene, natural, graduated, 500

\* For more information, refer to the Cable Guide on page 86.

## Chromatography Cables, Fittings, and Tubing

### Cables

Pg 86

731-8261 **System Cable 1**, 8-pin mini-DIN to DB-9 connector  
731-8262 **System Cable 2**, 8-pin mini-DIN to 8-pin standard DIN  
731-8263 **System Cable 3**, 8-pin mini-DIN to 8-pin mini-DIN  
731-8264 **System Cable 4**, 8-pin mini-DIN to banana plug cable

continues

Catalog # Description

**Cables (cont.)****Pg 86**

731-8265	<b>System Cable 5</b> , DB-9 connector to bare wires
731-8266	<b>System Cable 6</b> , 8-pin standard DIN to bare wires
731-8267	<b>System Cable 7</b> , 8-pin mini-DIN to bare wires
731-8268	<b>System Cable 8</b> , 8-pin standard DIN to DB-9 connector
731-8269	<b>System Cable 9</b> , 8-pin mini-DIN to Amersham FRAC-100
731-8283	<b>System Cable 12</b> , 8-pin mini-DIN to Isco DB-15 connector
731-8285	<b>System Cable 14</b> , 8-pin mini-DIN to Gilson connector
731-8286	<b>System Cable 15</b> , 15-pin D to mini-DIN
731-8287	<b>System Cable 16</b> , 8-pin mini-DIN to 8-pin standard DIN
750-0650	<b>System Cable 17</b> , bus communication cable, 1.2 m (4')
750-0651	<b>System Cable 18</b> , bus communication cable, 3.7 m (12')
750-0652	<b>System Cable 19</b> , bus communication cable, 9.2 m (30')
750-0655	<b>System Cable 21</b> , BioLogic HR system communication cable, 30 m (100')
731-9010	<b>System Cable 22</b> , Y-cable for connecting Econo gradient pump to Model 2110 fraction collector
731-9009	<b>System Cable 23</b> , Y-cable for connecting Econo gradient pump to BioFrac fraction collector
760-1309	<b>System Cable 24 (BioLogic QuadTec Analog)</b> , includes 2 cables, connects BioLogic QuadTec to SIM
760-1307	<b>System Cable 25 (BioLogic QuadTec RS-232)</b> , connects BioLogic QuadTec to ICM
760-1321	<b>System Cable 26 (ICM Power)</b> , connects to 12 V power on BioLogic DuoFlow workstation
760-2004	<b>System Cable 30</b> , bus communication cable, 0.3 m (1')
760-2032	<b>System Cable 31</b> , USB cable
731-8290	<b>BioFrac Accessory Cable</b> , 15-pin D to bare wires, for connecting BioFrac fraction collector to other equipment; for input or output signals

**Low-Pressure Tubing****Pg 86****Silicone Tubing**

731-8210	<b>Silicone Tubing</b> , 0.8 mm ID/0.8 mm wall, 10 m
731-8211	<b>Silicone Tubing</b> , 1.6 mm ID/0.8 mm wall, 10 m
731-8212	<b>Silicone Tubing</b> , 3.2 mm ID/0.8 mm wall, 10 m

**Tygon Tubing**

731-8213	<b>Tygon Tubing</b> , 0.51 mm ID/0.8 mm wall, 10 m
731-8214	<b>Tygon Tubing</b> , 0.8 mm ID/0.8 mm wall, 10 m
731-8215	<b>Tygon Tubing</b> , 1.6 mm ID/0.8 mm wall, 10 m

**PharMed Tubing**

731-8207	<b>PharMed Tubing</b> , 0.8 mm ID/1.0 mm wall, 10 m
731-8208	<b>PharMed Tubing</b> , 1.6 mm ID/1.0 mm wall, 10 m
731-8209	<b>PharMed Tubing</b> , 3.2 mm ID/1.0 mm wall, 10 m

**Pump Tubing Kits**




731-8240	<b>Pump Tubing Kit</b> , 0.8 mm ID silicone, 20 precut lengths and 4 sets of fittings, for use with EP-1 Econo pump
731-8241	<b>Pump Tubing Kit</b> , 1.6 mm ID silicone, 20 precut lengths and 4 sets of fittings, for use with EP-1 Econo pump
731-8242	<b>Pump Tubing Kit</b> , 3.2 mm ID silicone, 20 precut lengths and 4 sets of fittings, for use with EP-1 Econo pump
731-8247	<b>Pump Tubing Kit</b> , 0.8 mm ID PharMed, 20 precut lengths and 4 sets of fittings
731-8248	<b>Pump Tubing Kit</b> , 1.6 mm ID PharMed, 20 precut lengths and 4 sets of fittings
731-8249	<b>Pump Tubing Kit</b> , 3.2 mm ID PharMed, 20 precut lengths and 4 sets of fittings
731-9007	<b>Econo Gradient Pump Tubing Kit</b> , includes 2 each of 0.8, 1.6, and 3.2 mm PharMed tubing, for use with Econo gradient pump

**High-Pressure Tubing and Tubing Kits****Pg 87**

750-0603	<b>Teflon FEP Tubing</b> , 1/8" (0.125", 3.2 mm) OD x 0.062" (1.6 mm) ID, 15' (4.6 m), for pre-pump buffer inlet lines to the pumpheads
750-0602	<b>Tefzel Tubing</b> , 1/16" (0.062", 1.6 mm) OD x 0.020" (0.5 mm) ID, 30' (9.1 m), for system connections post-pump
760-0604	<b>PEEK Tubing</b> , orange, 1/16" OD x 0.020" ID x 30', rated to 5,000 psi
760-0605	<b>PEEK Tubing</b> , green, 1/16" OD x 0.030" ID x 30', rated to 3,000 psi
760-0650	<b>F10 Tubing Kit</b> , includes precut and fitted Teflon, Tefzel, and orange PEEK tubing for installation of BioLogic DuoFlow basic chromatography system running at flow rates <40 ml/min
760-0652	<b>F40 Tubing Kit</b> , includes precut and fitted Teflon, Tefzel, and green PEEK tubing for installation of BioLogic DuoFlow basic chromatography system running at flow rates ≥40 ml/min
760-2046	<b>pH Tubing Kit</b> , includes orange and green PEEK 1/4–28 prefitted tubing lengths for connection of the pH flow cell to the chromatography system
760-2002	<b>BioLogic Maximizer Tubing Kit</b> , includes 4 FEP Teflon prefitted tubing lengths for connection of solvent vials to the BioLogic Maximizer mixer; color coding indicates buffer solution
760-2003	<b>BioLogic Maximizer Interconnect Tubing</b> , includes 2 PEEK prefitted tubing lengths for connection of BioLogic DuoFlow pumps to the BioLogic Maximizer valve system



**Medium- and High-Pressure Fittings** Pg 87

Catalog #	Diagram	Description	Quantity
<b>Medium- and High-Pressure Fittings Kit</b>			
760-0550		<b>BioLogic System Fittings Kit</b> , includes PEEK and Tefzel nuts, ferrules, unions, plugs, and luer syringe	1
<b>Individual Medium- and High-Pressure Fittings</b>			
732-0113		<b>Luer to BioLogic System Fittings Kit</b> , includes 1/4–28 female to male luer, 1/4–28 female to female luer, to connect 1 cartridge to a BioLogic DuoFlow system	1
750-0556		<b>Ferrule and Lock Ring</b> , for 1/16" OD (1.6 mm) tubing	10
750-0559		<b>Tefzel Cap</b> , 1/4–28 female connection, to plug unused tubing	5
750-0560		<b>BioLogic Fittings Tool</b>	1
750-0561		<b>Tefzel Union Adaptor</b> , 1/4–28 to M6, to connect 1 M6 column to a BioLogic DuoFlow system	2
750-0562		<b>Tefzel Union</b> , 1/4–28 to 1/4–28 to extend tubing	5
750-0563		<b>Tefzel Plug</b> , 1/4–28 male connection, to plug unused ports on valves and columns	5
750-0564		<b>HPLC Column to BioLogic System Adaptors</b> , 2 fittings to connect 1 HPLC column (10-32) to a BioLogic DuoFlow system	2
750-0565		<b>Econo-Column to BioLogic System Fittings Kit</b> , 2 fittings to connect 1 Econo-Column (luer) column to a BioLogic DuoFlow system	1 set
750-0566		<b>Bottle Cap Kit</b> , includes 2 bottle caps, 2 plugs	1 set
750-0567		<b>UNO M6 Fittings Kit</b> , includes 2 nuts and 4 ferrules to connect UNO column to an FPLC system	1 set
750-0568		<b>UNO 10-32 Fittings Kit</b> , includes 2 nuts and 4 ferrules to connect UNO column to an HPLC system	1 set
750-0569		<b>Delrin Nut</b> , for 1/16" OD (1.6 mm) tubing	10
750-0570		<b>Delrin Nut</b> , for 1/8" OD (3.2 mm) tubing	5
750-0571		<b>Ferrule and Lock Ring</b> , for 1/8" OD (3.2 mm) tubing	5
750-0703		<b>Inline Filter Kit</b> , includes 1 inline filter and 2 replacement frits	1
750-0704		<b>Replacement Frits</b> , for inline filter kit	5
750-0553		<b>1/8" OD (3.2 mm) Pre-Pump Fittings</b> , includes Delrin nut, ferrules, lock ring	5
750-0554		<b>1/16" OD (1.6 mm) Post-Pump Fittings</b> , includes Delrin nut, ferrules, lock ring	10
760-1308		<b>Long Fingertight Fittings</b> , 10-32 x 0.82", for PEEK and Tefzel tubing	4
760-1311		<b>Long Fingertight Fittings</b> , 10-32 x 1.03", for PEEK and Tefzel tubing	4











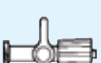

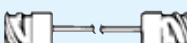



Catalog # Description Pg 87

**Low-Pressure System Fittings Kits**

731-8220 **Low-Pressure System Fittings Kit**, polycarbonate/polypropylene, 250 pieces  
 731-9006 **Econo Gradient Pump Fittings Kit**, includes 32 fittings, 12 tubing retainers

Catalog #	Diagram	Description	Quantity	Material
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**Individual Low-Pressure Fittings**

731-8221*		<b>0.8 mm Barb to Female Luer</b>	25	Polypropylene
731-8222*		<b>1.6 mm Barb to Female Luer</b>	25	Polypropylene
731-8223*		<b>3.2 mm Barb to Female Luer</b>	25	Polypropylene
731-8224		<b>0.8 mm Barb to Male Luer</b>	25	Polypropylene
731-8225		<b>1.6 mm Barb to Male Luer</b>	25	Polypropylene
731-8226		<b>3.2 mm Barb to Male Luer</b>	25	Polypropylene
731-8228		<b>Female Luer to Female Luer</b>	10	Polypropylene
731-8230		<b>Male Luer to Male Luer</b>	10	Polypropylene
731-8232		<b>Female Luer Plug</b>	25	Polypropylene
731-8233		<b>Male Luer Plug</b>	25	Polypropylene
731-8229		<b>Female Luer T-Connector</b>	10	Polypropylene
732-8302		<b>0.8 mm Barb T-Connector</b> , recommended for minimal dead-volume connection	25	Polypropylene
732-8300		<b>0.8 mm Barb to Barb Connector</b> , recommended for minimal dead-volume connection	25	Polypropylene
732-8103		<b>3-Way Stopcock</b> , 2 female luer to male luer	10	Polycarbonate/polypropylene
732-8107		<b>3-Way Stopcock</b> , nylon, solvent resistant	10	Nylon/polypropylene5
732-8102		<b>2-Way Stopcock</b> , female luer to male luer	10	Polycarbonate/ 40.00 polypropylene
732-3245		<b>Luer Tubing Adaptor</b> , with 5' of 0.8 mm ID Teflon tubing	5	Polypropylene/Teflon
732-8202		<b>Double Luer Tubing Adaptor</b> , with 5' of 0.8 mm ID Teflon tubing	1	Polypropylene/Teflon
732-0111		<b>Luer to M6 Adaptor Fittings Kit</b> , includes luer to M6 fittings to connect 1 cartridge to an FPLC system	1	PEEK/Tefzel 113.00
732-0112		<b>Luer to 10-32 Adaptor Fittings Kit</b> , includes luer to 10-32 fittings to connect 1 cartridge to an HPLC system	1	Polypropylene/Teflon
732-0113		<b>Luer to BioLogic System Fittings Kit</b> , includes 1/4-28 female to male luer, 1/4-28 female to female luer to connect 1 cartridge to a BioLogic DuoFlow system	1	Polypropylene/Teflon

\* Fits inlet and outlet of Econo-Column chromatography columns and low-pressure tubing.

## Chromatography Systems and Accessories

### Low-Pressure Systems

Catalog # Description

BioLogic LP Systems		Pg 88
731-8300	<b>Standard BioLogic LP System</b> , 100/120 V, includes BioLogic LP controller, BioLogic rack, accessory kit with MV-6 manual inject valve, proportioning valve/mixer, UV optics, conductivity cell, tubing and fittings kit, column and conductivity cell holder, starter kit	
731-8301	<b>Standard BioLogic LP System</b> , 220/240 V	
731-8302	<b>BioLogic LP System with Model 2110 Fraction Collector</b> , 110/120 V, includes standard BioLogic LP system, SV-3 diverter/bypass valve, system cable 1	
731-8303	<b>BioLogic LP System with Model 2110 Fraction Collector</b> , 220/240 V	
731-8304	<b>BioLogic LP System with BioFrac Fraction Collector</b> , 110/120 V, includes standard BioLogic LP system, system cables 3 and 15	
731-8305	<b>BioLogic LP System with BioFrac Fraction Collector</b> , 220/240 V	
731-8336	<b>BioLogic LP System with Model 2110 Fraction Collector and LP Data View Software</b> , 110/120 V, includes SV-3 diverter/bypass valve, system cable 1, 25' serial cable	
731-8337	<b>BioLogic LP System with Model 2110 Fraction Collector and LP Data View Software</b> , 220/240 V	
731-8338	<b>BioLogic LP System with BioFrac Fraction Collector and LP Data View Software</b> , 110/120 V, includes system cables 3 and 15, 25' serial cable	
731-8339	<b>BioLogic LP System with BioFrac Fraction Collector and LP Data View Software</b> , 220/240 V	
BioLogic LP Accessories and Replacement Parts		
731-8320*	<b>MV-6 Manual Inject Valve</b> , 6 ports	
731-8321*	<b>SV-5 Buffer Select Valve</b> , 5-port, 4-position solenoid random-access valve, 30 psi (2 bar) limit	
731-8322*	<b>SV-3 Diverter/Bypass Valve</b> , 3-way valve	
731-8323	<b>Gradient Mixer</b>	
731-8324	<b>BioLogic LP Optics Module</b>	
731-8165	<b>UV Flow Cell</b> , replacement	
731-8166	<b>Lamp</b> , replacement	
731-8167	<b>Filter Assembly</b> , 254 and 280 nm	
731-8155	<b>Conductivity Flow Cell</b>	
731-8350	<b>BioLogic LP Starter Kit</b> , includes buffers, standard, anion exchange cartridge	
* For more information, see page 89.		
BioLogic LP Data View Software		Pg 89
731-8365	<b>LP Data View Software for the BioLogic LP System</b> , includes software CD, cable adaptor	
BioLogic LP Valves		Pg 89
731-8321	<b>SV-5 Buffer Select Valve</b> , 5-port, 4-position solenoid random-access valve, 30 psi (2 bar) limit	
731-8320	<b>MV-6 Manual Inject Valve</b> , 6 ports	
731-8322	<b>SV-3 Diverter/Bypass Valve</b> , 3-way valve	
Econo Gradient Pump		Pg 90
731-9001	<b>Econo Gradient Pump</b> , 100/120 V, includes tubing and fittings kits	
731-9002	<b>Econo Gradient Pump</b> , 220/240 V	
Combination Systems		
731-9030	<b>Econo Gradient Pump Combo 1</b> , 100/120 V, includes Econo gradient pump, gradient mixer valve	
731-9032	<b>Econo Gradient Pump Combo 1</b> , 220/240 V	
731-9034	<b>Econo Gradient Pump Combo 2</b> , 100/120 V, includes Econo gradient pump, gradient mixer valve, MV-6 manual inject valve, rack with column clamps	
731-9036	<b>Econo Gradient Pump Combo 2</b> , 220/240 V	
731-9038	<b>Econo Gradient Pump Combo 3</b> , 100/120 V, includes Econo gradient pump, gradient mixer valve, rack with column clamps	
731-9040	<b>Econo Gradient Pump Combo 3</b> , 220/240 V	
Valves		
731-8322	<b>SV-3 Diverter/Bypass Valve</b> , 3-way valve	
731-8323	<b>Gradient Mixer</b>	
731-8320	<b>MV-6 Manual Inject Valve</b> , 6 ports	
Cables*		
731-9009	<b>System Cable 23</b> , Y-cable for connecting Econo gradient pump to BioFrac fraction collector	
731-9010	<b>System Cable 22</b> , Y-cable for connecting Econo gradient pump to Model 2110 fraction collector	
* For more information, refer to the Cable Guide on page 86.		

Catalog #	Description	
<b>Accessories</b>		
731-9004	<b>Econo Gradient Pump Rack</b> , preassembled	
731-9006	<b>Econo Gradient Pump Fittings Kit</b> , includes 32 fittings, 12 tubing retainers	
731-9007	<b>Econo Gradient Pump Tubing Kit</b> , includes 2 each of 0.8, 1.6, and 3.2 mm PharMed tubing	
<b>Model EP-1 Econo Pump</b>		<b>Pg 90</b>
731-8140	<b>Model EP-1 Econo Pump</b> , 100/120 V	
731-8142	<b>Model EP-1 Econo Pump</b> , 220/240 V	
<b>Accessories</b>		
731-8261*	<b>System Cable 1</b> , 8-pin mini-DIN to DB-9 connector	
731-8263*	<b>System Cable 3</b> , 8-pin mini-DIN to 8-pin mini-DIN	
731-8267*	<b>System Cable 7</b> , 8-pin mini-DIN to bare wires	
731-8286*	<b>System Cable 15</b> , 15-pin D to mini-DIN	
* For more information, refer to the Cable Guide on page 86.		
<b>Model EM-1 Econo UV Monitor</b>		<b>Pg 91</b>
731-8160	<b>Model EM-1 Econo UV Monitor</b> , 100/120 V, includes control module, optics module, filters for 254 and 280 nm wavelengths, system cable 4, fittings kit	
731-8162	<b>Model EM-1 Econo UV Monitor</b> , 220/240 V	
<b>Accessories</b>		
731-8168	<b>Model EM-1 Optics Module Assembly</b>	
731-8165	<b>UV Flow Cell</b> , replacement	
731-8166	<b>Lamp</b> , replacement	
731-8167	<b>Filter Assembly</b> , 254 and 280 nm	
<b>Model EG-1 Econo Gradient Monitor*</b>		<b>Pg 91</b>
731-8154	<b>Model EG-1 Econo Gradient Monitor</b> , includes 100/120 V (U.S.) power adaptor, flow cell, system cable 4	
731-8150	<b>Model EG-1 Econo Gradient Monitor</b> , includes flow cell, system cable 4; does not include power adaptor	
<b>Accessories</b>		
731-8270	<b>Power Adaptor</b> , 100/120 V, for USA, Canada, Japan, Mexico, Taiwan, and Latin America	
731-8271	<b>Power Adaptor</b> , 220/240 V, for Europe (except UK) and other countries not specifically listed	
731-8272	<b>Power Adaptor</b> , 220/240 V, for UK, Australia, and New Zealand	
731-8155	<b>Conductivity Flow Cell</b>	
*The Model EG-1 Econo gradient monitor requires a power adaptor; see options listed under Accessories.		
<b>Profinia Automated Protein Purification System</b>		<b>Pg 92</b>
<b>Profinia Systems with Accessory Kit</b>		
620-1005	<b>Profinia System with Native IMAC Starter Kit</b> , 100–240 V, includes cleaning tray, inline filter pack, 2 x 50 ml sample lids, 2 x 15 ml sample lids, bottle starter pack, waste/diluent bottle set, Profinia native IMAC buffer kit, 1 x 1 ml IMAC and 1 x 10 ml desalting cartridge, <i>E. coli</i> lysate	
620-1006	<b>Profinia System with GST Starter Kit</b> , 100–240 V, includes cleaning tray, inline filter pack, 2 x 50 ml sample lids, 2 x 15 ml sample lids, bottle starter pack, waste/diluent bottle set, Profinia GST buffer kit, 1 x 1 ml GST and 1 x 10 ml desalting cartridge, <i>E. coli</i> lysate, glutathione reagent	
<b>Profinia Systems with Software and Accessory Kit</b>		
620-1010	<b>Profinia System with Native IMAC Starter Kit</b> , 100–240 V, includes same as 620-1005 with Profinia software	
620-1011	<b>Profinia System with GST Starter Kit</b> , 100–240 V, includes same as 620-1006 with Profinia software	
<b>Profinia Systems with Computers, Software, and Accessory Kit</b>		
620-1015	<b>Profinia System with Native IMAC Starter Kit</b> , 100–240 V, includes same as 620-1010 with computer	
620-1016	<b>Profinia System with GST Starter Kit</b> , 100–240 V, includes same as 620-1011 with computer	
<b>Profinia Software, Version 2.0</b>		<b>Pg 93</b>
620-0010	<b>Profinia Software</b> , version 2.0, includes USB cable	
<b>Profinia Accessories</b>		<b>Pg 93</b>
620-0401	<b>Profinia Instrument Cooling Accessory</b> , includes 2 cooling units	
620-0411	<b>Profinia pH Monitor Kit</b> , includes pH electrode, flow cell, mounting accessories	
620-0402	<b>Profinia Desalting Sample Loop</b> , 2 ml loop, 10 ml syringe, fittings	
620-0403	<b>Profinia Desalting Sample Loop</b> , 10 ml loop, 10 ml syringe, fittings	
620-0404	<b>Profinia Instrument Inline Filter Pack</b> , includes 12 filters	
620-0405	<b>Profinia Sipper Tube Replacement Kit</b> , includes 10 pieces of precut tubing	
620-0410	<b>Profinia Instrument Accessory Kit</b> , includes cleaning tray, inline filter pack, 2 x 50 ml sample lids, 2 x 15 ml sample lids, bottle starter pack, waste/diluent bottle set	
620-0231	<b>Bottle Starter Pack</b> , includes 4 x 125 ml buffer bottles, 4 x 250 ml buffer bottles, 8 buffer bottle lids	

# Process-Scale Separations

Bio-Rad has extensive experience serving the separation technology community, supplying process media and process-scale chromatography equipment that offer optimal solutions to your separation needs. To order Bio-Rad process-scale columns and accessories, contact your local Bio-Rad sales representative.

## Process Media Selection Guide

Media	Process-Scale Availability	Bottled Media Sampling Kit	Bio-Scale™ Mini Prepacked Cartridges	Other Prepacked Columns
<b>Affinity</b>				
Profinity™ IMAC	page 39	—	page 62	—
UNOsphere SUPRA™ rProtein A	page 43	page 49	page 62	—
Affi-Prep® protein A	page 44	—	page 62	—
Affi-Gel® 10/15	page 46	—	—	—
Affi-Gel Blue	page 44	—	page 62	—
DEAE Affi-Gel Blue	page 44	—	page 62	page 65
CM Affi-Gel Blue	page 45	—	—	—
Affi-Prep polymyxin	page 45	—	—	—
Affi-Gel boronate	page 45	—	—	—
Affi-Gel HZ	page 46	—	—	—
Affi-Gel 102	page 46	—	—	—
<b>Analytical Grade Resins</b>				
AG® 1, 4	page 35	—	—	page 64
AG 50W	page 35	—	—	page 64
AG 501	page 35	—	—	—
Chelex®	page 35	—	—	—
<b>Hydrophobic Interaction</b>				
Macro-Prep® methyl HIC	page 48	—	—	—
Macro-Prep t-butyl HIC	page 48	—	—	—
<b>Ion Exchange</b>				
Nuvia™ S	page 33	page 49	—	—
Nuvia Q	page 33	page 49	—	—
UNOsphere™ Q	page 33	page 49	page 62	—
UNOsphere S, Rapid S	page 33	page 49	page 62	—
Macro-Prep High Q	page 34	page 49	page 62	—
Macro-Prep 25 Q	page 34	—	—	—
Macro-Prep DEAE	page 34	page 49	page 62	—
Macro-Prep High S	page 34	page 49	page 62	—
Macro-Prep 25 S	page 34	—	—	—
Macro-Prep CM	page 34	—	—	—
<b>Multimodal</b>				
CHT™ Type I	page 36	page 49	page 62	page 64
CHT Type II	page 36	page 49	page 62	—
Bio-Gel® HT/HTP	page 38	—	—	—
CFT™ Type II	page 37	page 49	page 62	—
<b>Size Exclusion</b>				
Bio-Gel P	page 47	—	page 62	page 63
Bio-Gel A	page 47	—	—	—
Bio-Beads™ S-X	page 48	—	—	—

For product applications and descriptions, please refer to the chromatography media selection guide on pages 31–32.

## Process-Scale Chromatography Media

Order Info: Pg 51

**Nuvia™ S and Q media** — The Nuvia family of chromatography media consists of next generation ion-exchange products built on a proven rigid polymeric base matrix. The media have superior flow properties and low nonspecific binding, while delivering high capacity and unique selectivity. Nuvia media bring together a unique set of properties specifically designed to meet the demands of current and future downstream processes. Nuvia media are flexible and robust with a large operational window making them an alternative to costly capture steps for IgG and other therapeutic proteins. The media can also be used as an effective intermediate and final polish step for the removal of common downstream impurities.

**For More Information**Web: [www.bio-rad.com/nuvia](http://www.bio-rad.com/nuvia)

Request or download bulletin: 5984, 5987, 6128, and 6129

**UNOsphere™ media** — A hydrophilic polymeric support based on a single-step polymerization process, this media delivers high productivity through high binding capacity and low backpressures. It is designed to meet the increasing needs of the biopharmaceutical industry for high-productivity chromatographic media, UNOsphere media is the ideal solution for efficient purification of biopharmaceutical molecules from crude feedstreams.

**For More Information**Web: [www.bio-rad.com/processiex](http://www.bio-rad.com/processiex)

**Macro-Prep® media** — Polymeric methacrylate media are available with strong or weak ion-exchange functionalities. These rigid, macroporous, hydrophilic media provide excellent dynamic binding capacity, resolution, and throughput at high flow rates for the purification of biomolecules. Macro-Prep media are an excellent choice for process-scale applications such as blood fractionation purification.

**For More Information**Web: [www.bio-rad.com/processiex](http://www.bio-rad.com/processiex)

**CHT™ ceramic hydroxyapatite** — This chemically pure form of hydroxyapatite is sintered at high temperatures to yield a mechanically robust spherical macroporous form of hydroxyapatite that can be used in the bioprocessing industry. It retains the unique separation properties of crystalline hydroxyapatite and can be used reproducibly for many cycles at high flow rates. The diverse binding capabilities of CHT for host cell proteins, leached protein A, antibody dimers and aggregates, nucleic acids, and viruses allow its use at any stage of downstream processing from initial capture to final polishing.

**For More Information**Web: [www.bio-rad.com/processCHT](http://www.bio-rad.com/processCHT)

**CFT™ ceramic fluoroapatite** — This chemically pure form of fluoroapatite is a rigid, spherical, macroporous media used in the purification of biologically significant compounds — it is ideally suited for the bioprocessing industry. CFT can be used under stringent conditions to separate acidic proteins requiring buffered conditions as low as pH 5.6. CFT has high binding capacity and may be used reproducibly over an extended number of chromatography runs. When CFT is used, process engineers can perform purifications across a range of lower pH values to obtain optimal and reproducible results for the targeted biomolecule.

**For More Information**Web: [www.bio-rad.com/processCFT](http://www.bio-rad.com/processCFT)

**AG® media** — These media are extensively processed to remove organic, inorganic, and metal impurities. They are suitable for the separation of low molecular weight molecules, such as inorganic ions, organic acids, peptides, and carbohydrates. AG media are used in numerous research applications where effective ion exchanges are needed. These media are available in biotechnology grade, which are treated to reduce bioburden to extremely low levels, making these media suitable for process-scale purification of biopharmaceuticals; AG 501-X8 is particularly useful in removing isocyanate from urea solutions.

**For More Information**Web: [www.bio-rad.com/processag](http://www.bio-rad.com/processag)

**Chelex® media** — These media can be used to remove metal ions from samples and buffers, and to extract DNA. They are made from a styrene divinylbenzene support coupled to paired iminodiacetate ions. Chelex media are also extensively used in environmental applications (glyphosate isolation).

**For More Information**Web: [www.bio-rad.com/processag](http://www.bio-rad.com/processag)

**Bio-Beads™ SM-2 media** — Nonpolar polystyrene-based media for hydrophobic interaction chromatography, Bio-Beads are used extensively for the removal of nonpolar detergents from biological preparations for manufacturing at both laboratory- and process-scale. The media are reusable and can be easily cleaned with alcohol solutions followed by a distilled water rinse.

**For More Information**Web: [www.bio-rad.com/processhic](http://www.bio-rad.com/processhic)

## Bio-Rad Process-Scale Chromatography Columns and Skids

Order Info: Pg 110

Bio-Rad offers two different types of columns to meet the needs of process separations: the Bio-Rad® EasyPack™ column and the Bio-Rad® InPlace™ column. The columns are designed for industrial applications, and are chemically resistant to solvents and reagents. All Bio-Rad EasyPack columns have the same basic design and are directly scalable from internal diameters of 100 to 1,400 mm. Special designs up to 2,000 mm are available on request.

### Bio-Rad EasyPack Column

The Bio-Rad EasyPack column has a fixed bottom end piece and an adaptor with a central screw adjustment mechanism. The simple design ensures easy column packing, operation, and unpacking. Bio-Rad EasyPack columns are easily upgradable to Bio-Rad InPlace columns.

#### For More Information

Web: [www.bio-rad.com/processcolumns](http://www.bio-rad.com/processcolumns)

Request or download bulletin: 5665

### Bio-Rad InPlace Column

A contained column that allows packing and unpacking in place, the column's integrated CIP system ensures constant product quality. The piston motors ensure reproducible packing by axial compression. Axial compression may be combined with flow packing. Specially designed slurry valves minimize mechanical stress on the resin during loading and unloading.

#### For More Information

Web: [www.bio-rad.com/processcolumns](http://www.bio-rad.com/processcolumns)

### Bio-Rad Process-Scale Column Replacement Parts and Accessories

Replacement parts are readily available as individual items or as kits. Contact your local Bio-Rad sales representative for more information.

#### For More Information

Web: [www.bio-rad.com/processcomponents](http://www.bio-rad.com/processcomponents)

Request or download bulletins: 5488, 5663, and 5665

### Bio-Rad Process Chromatography Skid 00

This versatile skid is a benchtop system for small-scale manufacturing processes. Possessing the dimensions of a pilot system, the skid 00 has a flow rate of 5–120 L/hr and is recommended for columns 70–300 mm in diameter. The skid can be tailored to applications using a proven platform approach. This is a self-contained system that integrates all necessary hardware components. An industrial wireless tablet PC with supervisory control and data acquisition (SCADA) software is used to run the chromatography process and to communicate with the PLC.

The skid hardware components are installed within a housing to keep electric and pneumatic parts isolated from the wetted tubing located on the front and side panels of the exterior case. The housing is made of stainless steel with a closed construction design, allowing the skid to be moved easily.

- Available for small-scale GMP production
- Designed for easy cleaning and maintenance



Bio-Rad EasyPack Column



Bio-Rad InPlace Column



Bio-Rad Process Chromatography Skid 00

- Configured for simultaneous inline dilution and gradient operations for high performance and reduced cost
- U.S. FDA 21 CFR Part 11 regulation-compliant software
- Documentation for regulatory submission

**For More Information**

Web: [www.bio-rad.com/processskid](http://www.bio-rad.com/processskid)  
Request or download bulletin: 5997

**Bio-Rad Process Chromatography Skids 01–05**

Bio-Rad skids integrate different components required for process chromatography into a core platform; skids 01–05 are available with upgrades according to customer requirements. The computer-driven operation records all events and actions in accordance with GMP compliance guidelines. Its simple, user-friendly interface enables touch-screen input of data and programming commands. The software meets U.S. FDA 21 CFR Part 11 requirements and was developed according to GAMP 5.

**For More Information**

Web: [www.bio-rad.com/processskid](http://www.bio-rad.com/processskid)  
Request or download bulletin: 5657



Bio-Rad Process Chromatography Skid

**Bio-Rad Process Chromatography Stations**

Order Info: Pg 110

**Bio-Rad Process Chromatography Station 00**

The Bio-Rad process chromatography station 00 is an all-in-one instrument that encloses the Bio-Rad skid 00, a process column with column ID between 100 and 300 mm, and a Bio-Rad prep station with pivoting table. The prep station integrates components for media transfer and resuspension, as well as for column lifting. A wireless tablet PC and software are included to fully control the chromatography station in manual and automatic modes.

Benefits include:

- Small footprint to save valuable space in the cleanroom
- All chromatography equipment is in a single unit
- Automated, preprogrammed methods
- Library of proven methods for column preparation
- Automatic loading, degassing, packing, re-slurrying, unloading, and cleaning of media if used with the Bio-Rad® InPlace™ column in a contained system
- Automatic degassing, packing, and re-slurrying of media if used with the Bio-Rad® EasyPack™ column
- Control of media packing by pressure and bed height; the preset bed height can be adjusted during the packing operation
- Easy lifting of column parts for maintenance and inspection

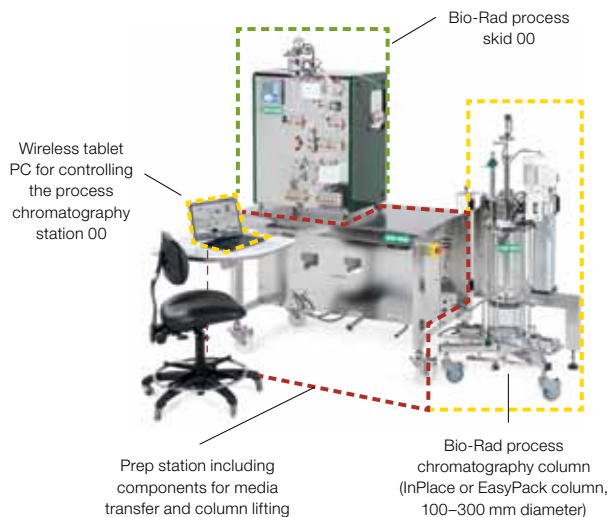
**For More Information**

Web: [www.bio-rad.com/chromstation](http://www.bio-rad.com/chromstation)  
Request or download bulletin: 6043

**Create Your Process Chromatography Station 00**



**Components of the Bio-Rad Process Chromatography Station 00**





## NEW Bio-Rad Process Chromatography Stations 01 and 02

The benefits and automation of the Bio-Rad process chromatography station 00 can be obtained at larger scale with Bio-Rad process chromatography stations 01 and 02. During scale-up, the concept remains the same with increased adaptability, which is needed for industrial equipment. All automation features are enabled by using a motorized Bio-Rad InPlace column, including a process system with all the functions for purification and sanitization. Apart from slurry transfer components, it also includes lifting equipment for column opening and preventive maintenance. The compact design of Bio-Rad process chromatography stations 01 and 02 is advantageous where space is limited.

### For More Information

Web: [www.bio-rad.com/chromstation](http://www.bio-rad.com/chromstation)

Benefits include:

- Automated methods to ensure reproducibility, avoid operator variances, and reduce manual operations
- Automated methods for the column (packing, re-slurrying, unpacking, and cleaning methods)
- Automated methods for the complete chromatography process (priming the hoses and tubes, gradient, and inline dilution)
- Different components (skid, MTD, and MainFrame™) are integrated in one single unit
- Small footprint to save cleanroom space
- Scale-up enabled for process chromatography stations 00, 01, and 02 column diameters between 100 and 600 mm
- Software that is compliant with U.S. FDA 21 CFR Part 11 regulations

## Bio-Rad Process-Scale Column Accessories

Order Info: Pg 110

### Bio-Rad Basic Control Console

The Bio-Rad basic control console ensures controlled movement of the variable height adaptor in manual mode for Bio-Rad® EasyPack™ and Bio-Rad® InPlace™ process-scale chromatography columns. The linear speed of the piston and torque limitation can be programmed on the digital touch-screen user interface to provide reproducibility and added security during column operations such as packing, unpacking, and cleaning. The control console can monitor up to three different diameters in a predefined column diameter range.

### Bio-Rad InPlace Control Console

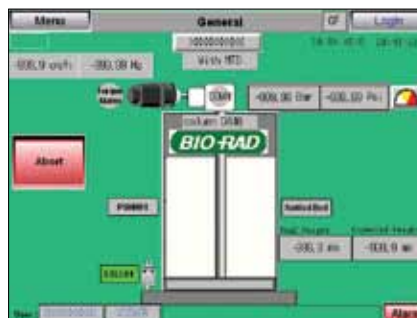
Bio-Rad InPlace process-scale chromatography columns are designed for industrial applications and allow contained filling, packing, unpacking, and cleaning in place. The columns have a sanitary design, variable height adaptor, piston motor, inflatable seal, and special low-shear valves for safe slurry transfer. Bio-Rad introduces the InPlace control console to be used with Bio-Rad InPlace columns to provide assistance with column filling, packing, unpacking, and cleaning operations. Preprogrammed methods operate these processes, reducing operator hands-on time.

Benefits include:

- A user-friendly touch-screen interface (OMRON PLC)
- Preprogrammed methods in automatic mode for time savings and reproducible packing results
- Optional choice of programming media transfer in syringe mode or by using media transfer device
- Easy-to-use preprogrammed piston height adjustment
- A safety system for automatic shutoff when reaching preset pressure limits, piston position, linear speed (in cm/hr), or torque



Bio-Rad InPlace Column with Control Console



Main view of the control console software.

- Recognition and control of up to 3 different column diameters in ranges of up to 400 mm or >450 mm
- Software that is compliant with U.S. FDA 21 CFR Part 11 regulations
- Data accessibility through Ethernet connections
- Onboard maintenance and inspection guide with easy-to-follow, step-by-step instructions

#### For More Information

Web: [www.bio-rad.com/processcomponents](http://www.bio-rad.com/processcomponents)

Request or download bulletin: 6042

#### Bio-Rad Media Transfer Device

The Bio-Rad media transfer device is a self-contained unit designed to transfer chromatography media from a tank to a column, to unload a column into a tank, or to deliver cleaning solutions to columns. It is specially designed for cleaning in place (CIP) operations with Bio-Rad InPlace columns.

Process piping is made from 316L stainless steel,  $R_a \leq 0.8$  mm, with tri-clamp sanitary fittings. Separate pumps are used for the media and the cleaning solutions to prevent cross-contamination.

Full documentation is supplied with the device.

#### For More Information

Web: [www.bio-rad.com/processcomponents](http://www.bio-rad.com/processcomponents)

Request or download bulletin: 5661



Bio-Rad Media Transfer Device

#### Bio-Rad Media Slurry Tank

The Bio-Rad media slurry tank has a usable capacity of 100, 300, 500, or 900 L with one access port, one top inlet with clamp connection, and one lower outlet with clamp connection. The tank is equipped with a circular bottom to optimize drainability.

The tank includes an agitator with propeller and a rotating, spraying ball for CIP. The tank is designed for use at atmospheric pressure. Material certificates, welding certification, and documentation associated with integrated components are included.

#### For More Information

Web: [www.bio-rad.com/processcomponents](http://www.bio-rad.com/processcomponents)

Request or download bulletin: 5620

#### Bio-Rad® MainFrame™ Lifting Accessory

The Bio-Rad MainFrame lifting accessory can be used with Bio-Rad process-scale chromatography columns in a cleanroom environment to provide electrical-driven, hoist-free operation of the height adaptor during initial column preparation, inspection, maintenance, postprocessing, and cleaning.

It is available in four standard categories for a predefined range of column diameters:

- Bio-Rad MainFrame 300 for columns from 140 mm to 300 mm in diameter
- Bio-Rad MainFrame 450 for columns from 200 mm to 450 mm in diameter
- Bio-Rad MainFrame 800 for columns from 450 mm to 800 mm in diameter
- Bio-Rad MainFrame 1000 for columns from 600 mm to 1,000 mm in diameter

The Bio-Rad MainFrame lifting accessory can be used with multiple columns within its range, and is available on request for use with larger column diameters.

#### For More Information

Web: [www.bio-rad.com/processcomponents](http://www.bio-rad.com/processcomponents)

Request or download bulletin: 5659; for process hardware accessories — 5614, 5615, 5616, 5617, 5618, and 5619

## Process-Scale Separations

Catalog # Description

### Bio-Rad Process-Scale Chromatography Media

Pg 51

For Ordering Information see page 51.

### Bio-Rad Process-Scale Chromatography Columns and Skids

Pg 106

#### Bio-Rad Process Chromatography Columns

Varies\* **Bio-Rad InPlace Process Column**, 180–300 mm

Varies\* **Bio-Rad EasyPack Process Column**, 100–300 mm

\* Please go to [www.bio-rad.com/process](http://www.bio-rad.com/process) to select the appropriate InPlace or EasyPack column with column IDs between 100 and 300 mm.

#### Bio-Rad Process Chromatography Skid

739-3006 **Bio-Rad Process Chromatography Skid 00**, 5–120 L/hr flow rate, 0.2 L bubble trap

#### Options for Bio-Rad Process Chromatography Skid 00

739-3306 **Sample Injection Pump**, third pump for sample injection

739-3146 **Air Sensor**, air sensor after bubble trap

739-3272 **Pressure Sensor**, pressure sensor after column

739-3156 **Conductivity Monitor**, conductivity monitor before column

739-3166 **pH Monitor**, pH monitor before column

739-3126 **Additional Outlets**, 4 additional outlets

### Bio-Rad Process Chromatography Stations

Pg 107

#### Bio-Rad Prep Station

739-3810 **Prep Station Configuration 1**, includes pivoting table, components for media transfer, column lifting, controlling column motorization, re-slurrying, and cleaning operations of Bio-Rad InPlace column, wireless tablet PC with software

### Bio-Rad Process-Scale Column Accessories

Pg 108

#### Bio-Rad Basic Control Console

739-2102 **Basic Control Console**, 2.2 kW, for column diameters 400–596 mm, includes variable frequency drive

739-2103 **Basic Control Console**, 4.0 kW, for column diameters 596–800 mm, includes variable frequency drive

739-2104 **Basic Control Console**, 7.5 kW, for column diameter 1,000 mm, includes variable frequency drive

739-2105 **Basic Control Console**, 4.0 kW, for column diameters 1,200–1,400 mm, includes variable frequency drive

739-2106 **Basic Control Console**, 1.5 kW, for column diameters 296–500 mm, includes variable frequency drive

739-2108 **Basic Control Console**, 0.75 kW, for column diameters 180–350 mm, includes variable frequency drive

#### Bio-Rad InPlace Control Console

739-2115 **Bio-Rad InPlace Control Console**, for column diameters 180–446 mm, includes variable frequency drive 1.5 kW, instrumentation on the column

739-2116 **Bio-Rad InPlace Control Console**, for column diameters 446–1,300 mm, includes variable frequency drive 7.5 kW, instrumentation on the column

739-2117 **Bio-Rad InPlace Control Console**, for column diameters  $\geq 1,400$  mm, includes variable frequency drive 7.5 kW, instrumentation on the column