



NGC™ Chromatography Systems

Comprehensive Solutions for Protein Purification



DESIGNED BY YOU. BUILT BY BIO-RAD.

NGC Medium-Pressure Chromatography Systems

The NGC instrument is an automated liquid chromatography system focused on biomolecule purification at the research, process development, and laboratory-scale levels. At the core of the NGC platform is a truly modular and scalable system combined with a single, intuitive software package for system control and evaluation. Together, the NGC Systems provide a total laboratory solution.



ALIGNS

A single solution that aligns to your needs today and expands to support your future discoveries and throughput requirements



ADAPTS

A flexible system that adapts to your requirements and can be easily customized to suit your application needs



ENSURES

An intelligent design that ensures functional simplicity and guides you from experimental setup to analysis and support





ALIGNS

A single laboratory chromatography solution that aligns and scales to fit your throughput requirements

NGC Systems can be selected based on customer needs and can be further customized to fit changing customer requirements through the addition of more modules and capabilities.

Capabilities Included in All NGC Systems

Choice of 10 ml/min or 100 ml/min system pumps, mixer module with multiple mixer barrel options (750 μ l, 2 ml, 5 ml, 12 ml), automated sample inject valve, ChromLab™ Software, and a touch screen.

Enhancements Available for All Systems

Increase automation and functionality by adding modules for different phases of your purification scheme. All systems are compatible with the versatile, high-capacity NGC Fraction Collector and BioFrac™ Fraction Collector for automated fraction collection (analytical- to preparative-scale). See bulletin 6326 for more details.



NGC Quest™ System

Designed for the easy, dependable, and all-purpose purification of biomolecules with accurate gradients and high-resolution separations

Base system includes:

- Single-wavelength (UV) and conductivity detection
- ChromLab Software, for fast, easy automated and manual control — single platform compatible with all NGC Systems

NGC™ Quest Plus System

Designed for the all-purpose purification of biomolecules and simultaneous detection of proteins, peptides, nucleic acids, and other chromogenic molecules

Includes NGC Quest capability, plus:

- Multi-wavelength (UV/Vis) detection of up to 4 wavelengths simultaneously



NGC Scout™ System

Designed for quick, reliable separation of proteins and peptides. Enables rapid scouting of protein purification conditions with automated gradients and buffer preparation

Includes NGC Quest capability, plus:

- Buffer blending valve for automated inline buffer preparation
- pH valve to monitor buffer pH and separation by pH gradients

NGC™ Scout Plus System

Designed for the simultaneous detection of proteins, peptides, nucleic acids, and other chromogenic molecules with expanded automation and scouting

Includes NGC Scout capability, plus:

- Multi-wavelength (UV/Vis) detection of up to 4 wavelengths simultaneously



NGC Discover™ System

Designed for higher throughput, rapid and secure methods, and process development. Provides expanded scouting options with the simultaneous detection of proteins, peptides, nucleic acids, and other chromogenic molecules

Includes NGC Scout Plus capability, plus:

- Integrated sample pump, 100 ml/min
- Sample inlet valves
- Column switching valve, 10 ml or 100 ml options

NGC™ Discover Pro System

Designed for higher throughput, rapid and secure methods, and process development

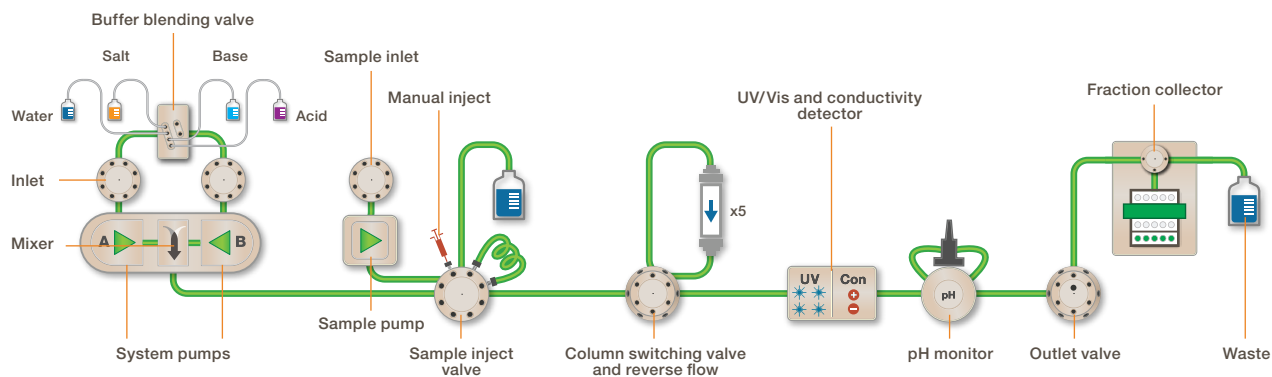
Includes NGC Discover capability, plus:

- Sample inlet valve
- Sample outlet valve

Options

- Tandem purification with additional column switching valve

NGC SYSTEM CAPABILITIES



System Pumps

Pump selection of up to 10 ml/min or 100 ml/min flow rates with the option to switch out pumps to meet your application requirements.

F10 Pumps

- Flow rate of 0.001–10 ml/min at 3,650 psi (25.2 MPa)
- Ideal for small-scale preparative purifications
- Can also be used for analytical HPLC separations

F100 Pumps

- Flow rate of 0.01–100 ml/min at 1,450 psi (10 MPa)
- Flexible flow rate range
- Ideal for scale-up applications

Sample Pump

For automated sample application with the ability to load large sample volumes. Includes an integrated pressure sensor. Add a sample inlet valve or connect a third-party autosampler with a signal import module (SIM) for increased, automated sample loading capabilities.

Mixer

Homogenizes buffers from two system pumps and can accommodate varying volumes (different sized barrels are available). Includes a mixer motor and integrated pressure sensor.

Detectors

Ensure accurate detection of biomolecules such as proteins, peptides, nucleic acids, and chromophores. Include an integrated conductivity monitor (0.01–999 mS/cm) and an optional pH monitor (pH 1–14).

Single-Wavelength (UV) Detector

For the detection of standard proteins (280 nm) or nucleic acids (255 nm).

Multi-Wavelength (UV/Vis) Detector

For greater sensitivity and flexible detection of any biomolecules and chromophores (190–800 nm). Simultaneous multi-wavelength (UV/Vis) detection of up to four wavelengths.

Connect external detectors to the NGC System via the signal import module.

Air Sensor

Detects end of buffer and sample to protect against column damage. Air sensor extension enables use of up to four additional air sensors (eight total).

Valves

Sample Inject Valve

For accurate sample loading (µl to L volumes) with a low internal volume for minimal sample loss.

Buffer Blending Valve

For fast pH scouting with automated inline buffer preparation and the ability to double the fluid output to 20 ml/min or 200 ml/min.

pH Valve

For accurate inline pH monitoring (pH 1–14). Includes integrated bypass valve and calibration port for in situ calibration.

Buffer Inlet Valve

Automated switching between buffers (up to eight inlets per valve) for accelerated method development, column cleaning, and regeneration. Option to include two inlet valves, one for each system pump.

Column Switching Valve and Reverse Flow

Automated column/media scouting of up to five columns without replumbing. Includes reverse flow for rapid elution, sample concentration, and column cleaning. Internal bypass allows automated system priming and cleaning with integrated pressure sensors that measure pre- and delta-column pressures.

Outlet Valve

For enhanced automated fraction collection of large volume fractions with up to 12 vessels.

Accessories

NGC Fraction Collector (catalog #17002070)

Provides automated collection options for discovery to small-scale batch production at flow rates up to 200 ml/min. It supports multiple rack and vessel collection combinations from microplates and tubes to bottles and carboys.

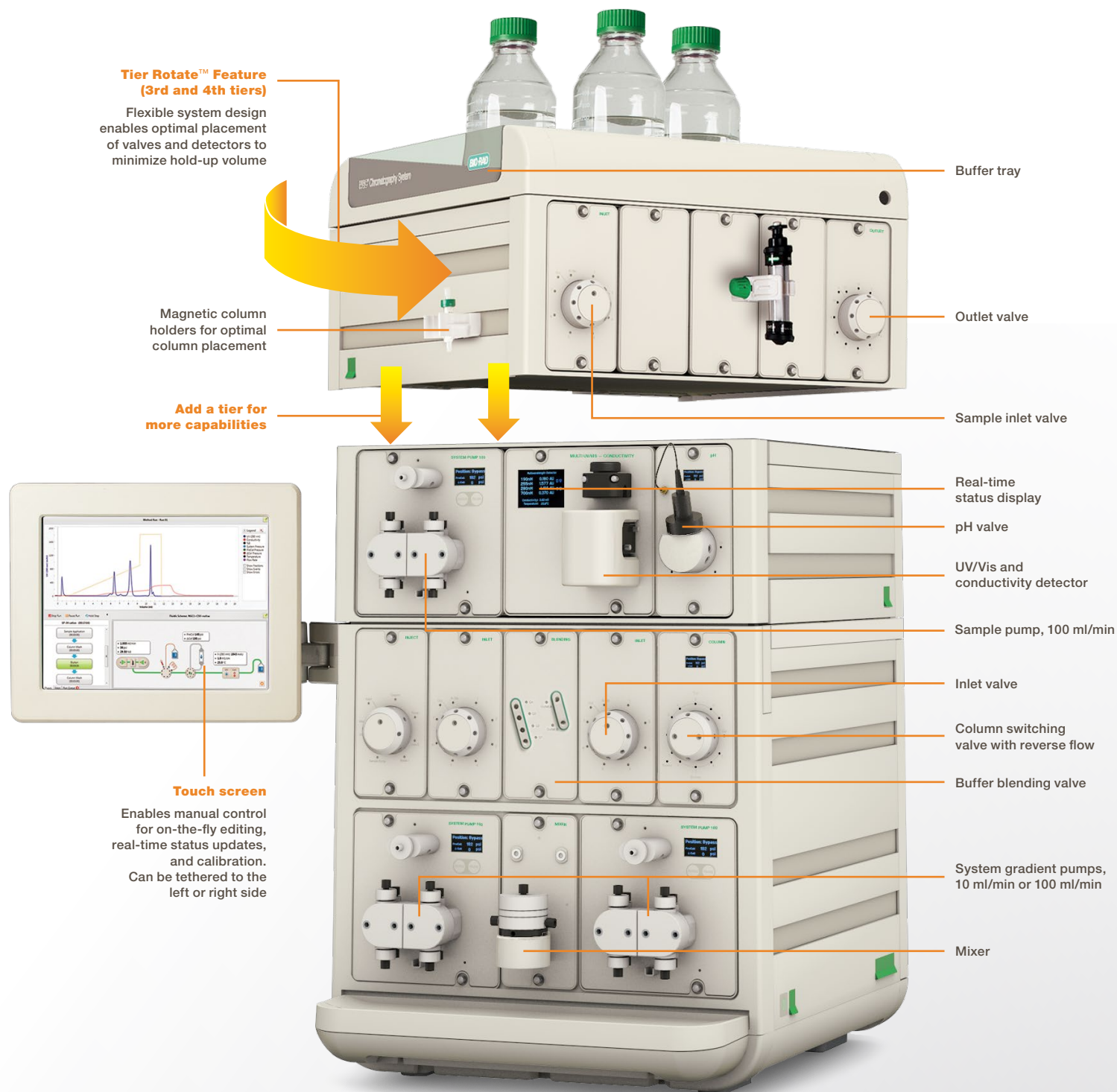


BioFrac Fraction Collector (catalog #7410002)

Reliable fraction collection from analytical to preparative scale with versatile capability to collect from 96-well plates to 30 mm tubes.



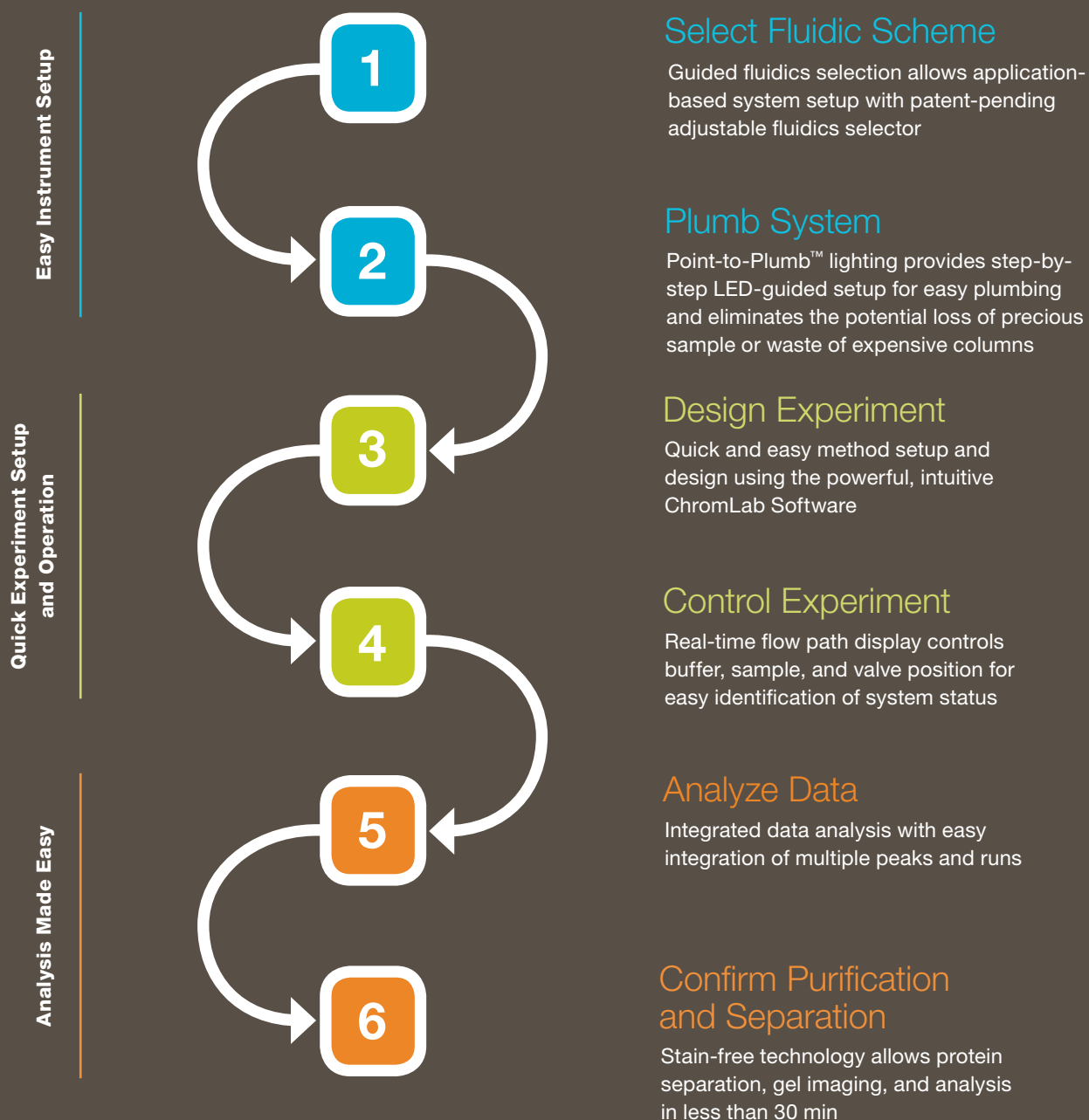
PERSONALIZE AND EXPAND YOUR SYSTEM CAPABILITIES TO SUIT YOUR APPLICATION NEEDS AND WORKFLOW





ADAPTS

Powerful ChromLab Software control, transferable across all NGC Systems, enables minimal training and fast setup to analysis.



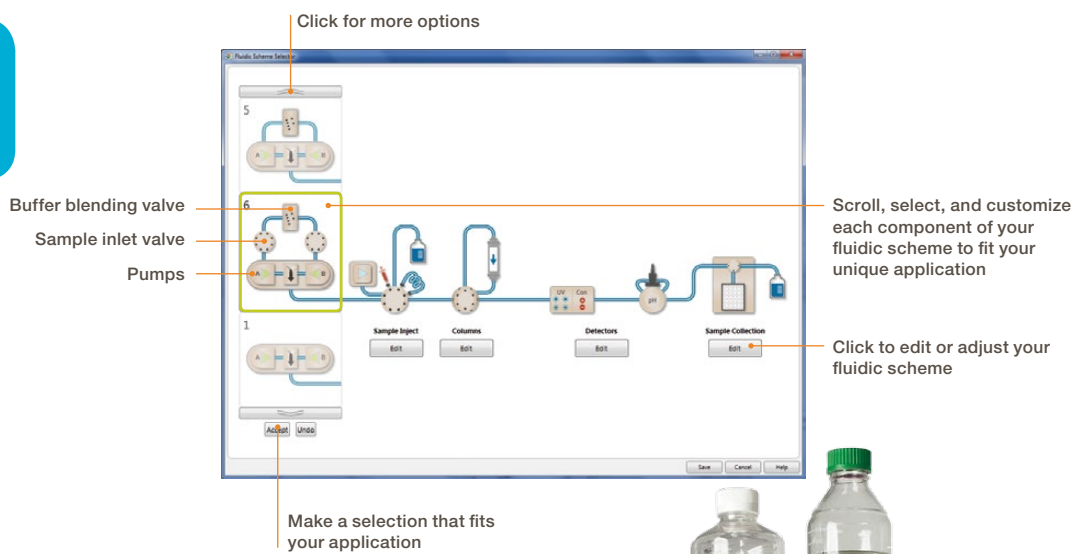
EASY INSTRUMENT SETUP

1

Select Fluidic Scheme

Select the fluidic scheme that best fits your application, set a default path, and optimize your module placement

To view the complete module library see bulletin 6326 or the NGC System Tour at bio-rad.com/NGCSystems



Choose new modules to add to your system capabilities (for example, add a sample pump for loading large sample volumes)

Change module locations to adjust to your application and achieve optimal results

2

Plumb System

Point-to-Plumb intuitive graphical indicators for simple, guided LED plumbing setup



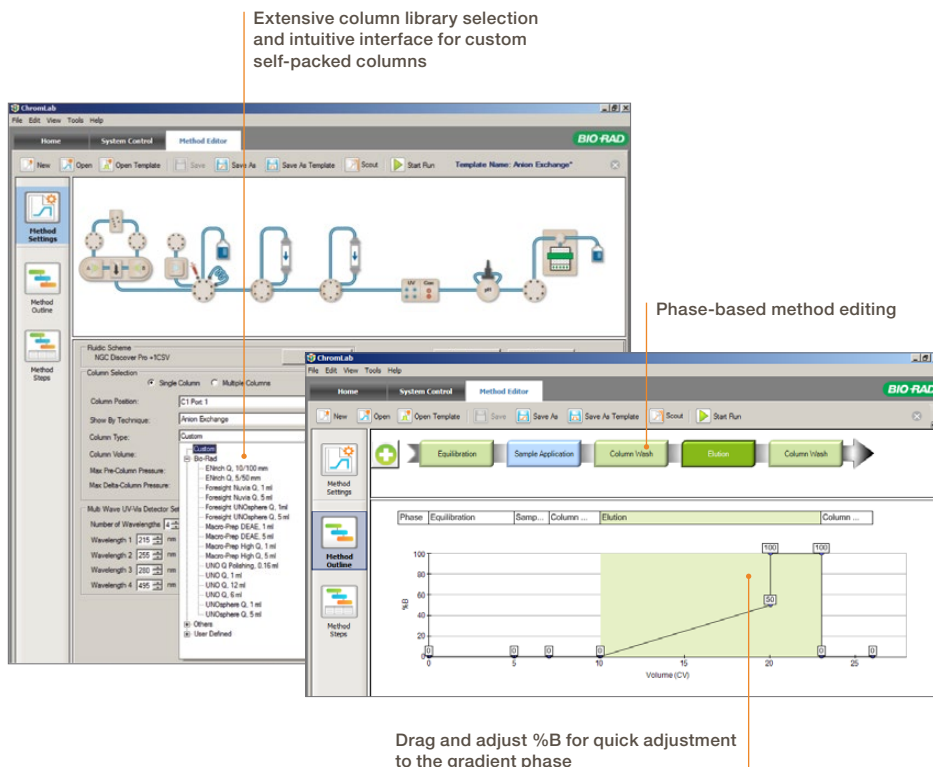
Click on each step in the flow path to guide system plumbing. Then, appropriate LEDs will light up to guide plumbing (as shown above).

QUICK EXPERIMENT SETUP AND OPERATION

3

Design Experiment

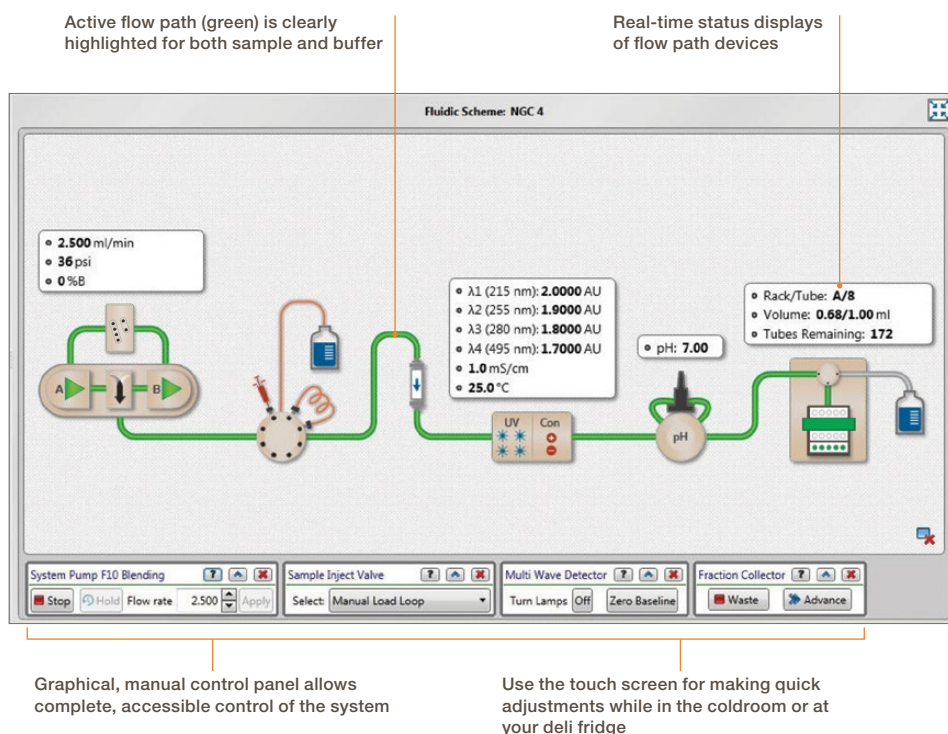
The ChromLab Method Editor enables confident, automated walk-away purification



4

Control Experiment

Manual controls, conveniently located for quick and easy access, provide total graphical user control of the NGC System with a coldroom-compatible touch screen or a computer



For further details see the NGC System Tour at bio-rad.com/NGCSystems

ANALYSIS MADE EASY

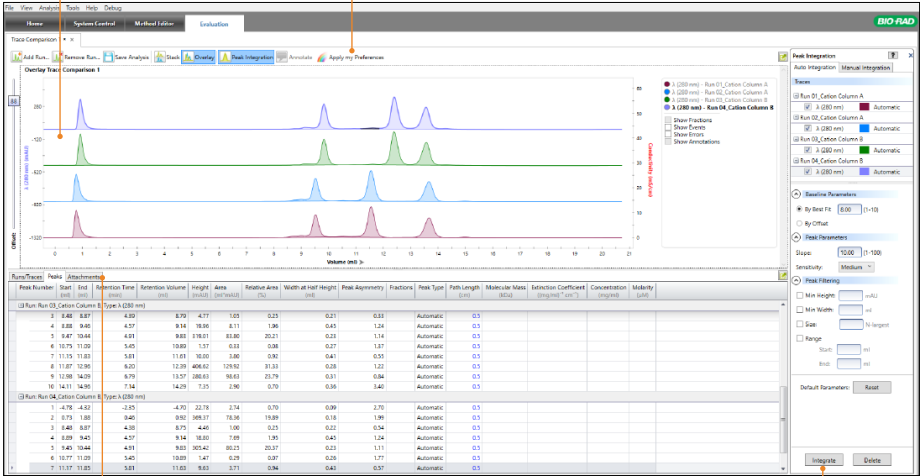
5

Analyze Data

Comprehensive data analysis that enables fast, accurate data comparison

Ability to overlay and zoom in on multiple chromatograms

Enhanced user-specific preferences for personalized analysis



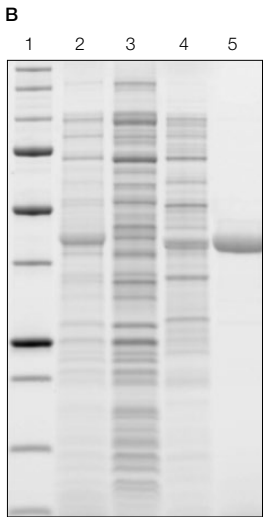
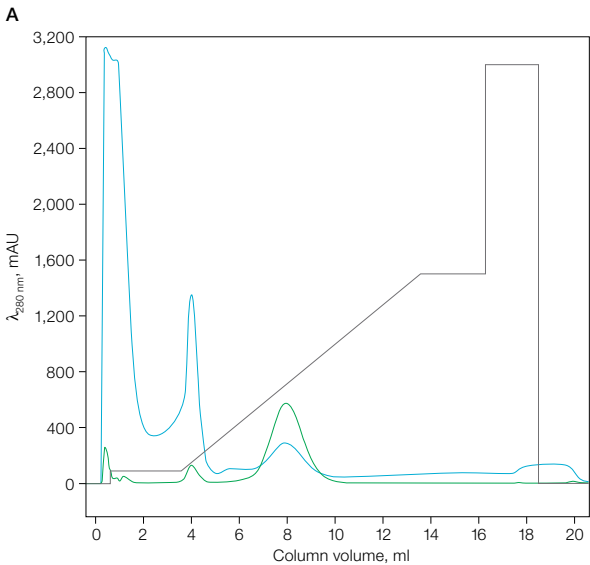
Keep all relevant purification data together like fraction gel images

Simple peak integration across multiple runs with single button autointegration

6

Confirm Purification and Separation

Stain-free technology allows protein separation, gel imaging, and analysis in less than 30 min

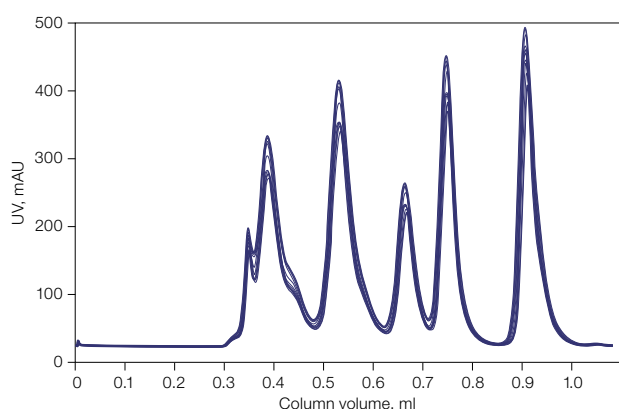


Visual confirmation of chromatography results using stain-free gels and imaging. A, isolation of a histidine-tagged green fluorescent protein (GFP) from a crude *Escherichia coli* lysate by affinity chromatography using an IMAC column; **B,** purification was confirmed by SDS-PAGE using a Criterion™ TGX Stain-Free™ Gel run for 20 min and directly visualized on the Gel Doc™ EZ Imaging System without the need for Coomassie staining. Samples in lanes 2 (crude *E. coli* lysates), 3 (flowthrough from the IMAC column), 4 (10% imidazole column wash), and 5 (purified histidine-tagged GFP) were compared against Precision Plus Protein™ Unstained Standards (lane 1).

Intelligent design that guides your setup and operation

Preplumbed System

Quality control (QC)–validated performance optimized for low hold-up volume translates to more reproducible results and sharper peaks



High-quality results with reproducible separations. Eleven overlaid separations of a Bio-Rad size exclusion standard — composed of thyroglobulin, γ -globulin, ovalbumin, myoglobin, and vitamin B₁₂ — performed on the NGC Quest System with a 10 x 300 mm size exclusion column.

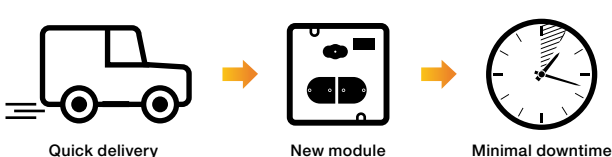
Real-Time Status Displays

Provide immediate status of important parameters for clear diagnostics of key NGC instrument modules



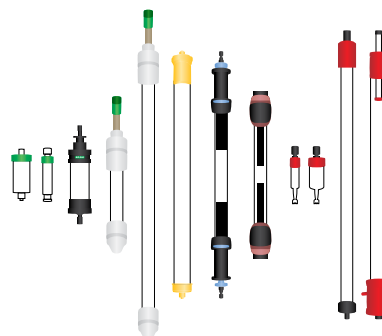
Module Replacement Service

Directly replace plug and play modules — eliminate lengthy downtime and costly service visits

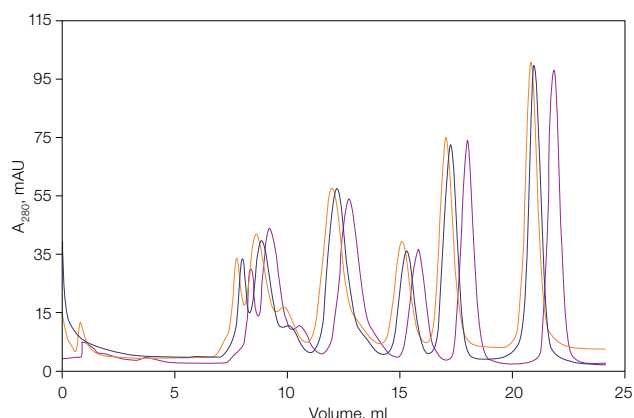


Open Platform

Compatible with all medium-pressure columns and ChromLab Software includes method templates with column libraries



Validated column applications on the NGC System.



Completely transferable applications. Identical comparisons of a Bio-Rad size exclusion standard (catalog #1511901) performed on a Superdex 200 10/300 GL Size Exclusion Column with separations performed on the NGC Quest (—), ÄKTApurifier (—), and ÄKTA avant (—) Systems.

SELECTION GUIDE

NGC Chromatography Systems

Catalog #	Product Description	NGC Quest 10 7880001	NGC Quest 10 Plus 7880003	NGC Quest 100 7880002	NGC Quest 100 Plus 7880004	NGC Scout 10 7880005	NGC Scout 10 Plus 7880007	NGC Scout 100 7880006	NGC Scout 100 Plus 7880008	NGC Discover 10 7880009	NGC Discover 100 7880010	NGC Discover 10 Pro 7880011	NGC Discover 100 Pro 7880012
7884002	NGC F10 Pump Module	•	•			•	•			•		•	
7884003	NGC F100 Pump Module			•	•			•	•		•		•
7884018	NGC Mixer Module	•	•	•	•	•	•	•	•	•	•	•	•
7884007	NGC Sample Inject Valve Module	•	•	•	•	•	•	•	•	•	•	•	•
7884008	NGC Single-Wavelength Detector Module, includes conductivity monitor	•		•		•		•					
7884009	NGC Multi-Wavelength Detector Module, includes conductivity monitor	○	•	○	•	○	•	○	•	•	•	•	•
7884010	NGC Buffer Blending Valve Module	○	○	○	○	•	•	•	•	•	•	•	•
7884011	NGC pH Valve Module, includes pH probe	○	○	○	○	•	•	•	•	•	•	•	•
7884004	NGC Sample Pump Module, integrated	○	○	○	○	○	○	○	•	•	•	•	•
7884006	NGC Inlet Valve Module	○	○	○	○	○	○	○	•	•	•	•	•
7884012	NGC Column Switching Valve Module, 10 ml	○	○	○	○	○	○	○	•	○	•	•	○
7884026	NGC Column Switching Valve Module, 100 ml	○	○	○	○	○	○	○	○	•	○	•	•
7884013	NGC Outlet Valve Module	○	○	○	○	○	○	○	○	○	•	•	•
7886000	ChromLab Software	•	•	•	•	•	•	•	•	•	•	•	•

- Standard
- Optional

Note: All NGC Systems include a touch screen and NGC Fittings Kit (catalog #7884017) and are compatible with the NGC Fraction Collector and BioFrac Fraction Collector.

Visit bio-rad.com/web/NGCChromSystems for more information.



Specifications

System Specifications

Control system	ChromLab Software (compatible across all NGC Systems)
Dimensions (W x D x H)	49 x 61 x 56 cm (NGC Quest and NGC Scout Systems) 49 x 61 x 74 cm (NGC Discover System)
Weight (excluding computer)	41–46 kg (NGC Quest and NGC Scout Systems) 64 kg (NGC Discover System)
Power supply	100–240 V, 50–60 Hz
Power consumption	750 W maximum

System Pump

Pump type	Reciprocating piston
Flow rate setting	10 ml/min pumps: 0.001 to 10 ml/min (normal range) 100 ml/min pumps: 0.01 to 100 ml/min (normal range)
Flow rate accuracy	±2% (conditions: F10 pump — 0.1 to 10 ml/min, F100 pump — 1.0 to 100 ml/min; pressure: <600 psi [4.1 MPa, 41 bar]; viscosity: 0.5–3.7 cP)
Pressure range	10 ml/min pumps: 0 to 25.2 MPa (3,650 psi) 100 ml/min pumps: 0 to 10 MPa (1,450 psi)
Viscosity range	0.5–10.8 cP (for 10 ml/min and 100 ml/min pumps)

Sample Pump

Pump type	Piston pump, metering type
Flow rate setting	0.01 to 100 ml/min
Flow rate accuracy	±2%
Pressure range	0 to 10 MPa (1,450 psi)
Viscosity range	0.5–10.8 cP

Mixer

Mixing principle	Chamber with magnetic stirrer
Mixer volume	263 µl (included), 750 µl (included), 2 ml, 5 ml (F10) 750 µl (included), 2 ml (included), 5 ml, 12 ml (F100)
Gradient composition accuracy	±0.5% (conditions: 3 to 97%B, 0.25 to 10 ml/min F10 pumps) ±0.8% (conditions: 5 to 95%B, 1 to 100 ml/min F100 pumps)

Valves

Type	Rotary valves and rocker solenoid
Number of valves	1 inject valve, up to 2 x 8-port sample inlet valves, and 2 x 8-port buffer inlet, 2 x 12-port outlet, and 3 x 5-port column switching valves
Functions	Loop selection (PEEK Loop and DynaLoop™ offerings)

Pressure Sensors

Placement of sensors	Standard: after system pump Options: precolumn, postcolumn
Range	0–3,650 psi
Accuracy	±2 psi or 2%, whichever is greater

Inlet Valves

Inlet A	8 inlets
Inlet B	8 inlets
Sample inlet	8 inlets

UV and UV/Vis Detectors

(each includes an integrated conductivity monitor)

Wavelength	Single-wavelength: 255 nm (nucleic acids) or 280 nm (proteins) Multi-wavelength (up to 4): 190–800 nm
Absorbance range	0 to >2.8 AU*
Linearity	0 to 2 AU within ±5%
Operating pressure	1,450 psi (10 MPa) for 5, 10 mm flow cells 700 psi (5 MPa) for 2 mm flow cells
Flow cells	Preparative: 2 mm (cell volume: 20 µl) Analytical: 5 mm (cell volume: 16 µl) Analytical: 10 mm (cell volume: 18 µl)

* For 5 mm and 10 mm flow cells.

Conductivity Monitor

Conductivity reading range	0.01–999 mS/cm
Accuracy	±2%
Operating pressure	0–5.5 MPa (800 psi)
Flow cell volume	6 µl
Temperature monitor range	4–50°C
Temperature monitor accuracy	±2%

pH Monitor

pH reading range	0 to 14
Accuracy	±0.1 pH unit within pH 2–12
Operating pressure	0 to 70 psi with pH probe inline and 0–500 psi in bypass mode
Flow cell volume	100 µl (210 µl including internal flow paths)

NGC Fraction Collector

Collection modes

Collect All, Threshold, and Time/Volume windows	
Flow rate	0.01–200 ml/min

Collection rack options

(each NGC Fraction Collector can accommodate 4 racks)

96 x 13 mm tubes, 75 x 16 mm tubes,
75 x 18 mm tubes, 27 x 50 ml tubes,
2 x deep well microplates (24-/48-/96-well),
96 x 1.5–2 ml capless tubes, 16 x 250 ml
bottles, and 40 x unlimited volume
prep-rack adaptors

Peltier cooling option	Yes
Operating temperature	4–40°C
Dimensions (W x D x H)	42 x 60 x 54.5 cm

BioFrac Fraction Collector

Collection modes

Time	0.02–99,999 min
Volume	0.02–99,999 ml
Flow rate	0.01–100 ml/min

Collection rack options

180 x 12–13 mm tubes, 120 x 15–16 mm
tubes, 80 x 18–20 mm tubes, 168 x 1.5 ml
microtubes, 24 x 30 mm tubes, 4 x 96-,
48-, 24-, or 12-position microplates, 4 x
250 ml bottles, and 20 x unlimited volume
prep-rack adaptors

Operating temperature	4–40°C
Dimensions (W x D x H)	44.5 x 35.6 x 38.7 cm

Column Switching

Five-column valve	Can connect up to 5 columns with forward and reverse flow and bypass capability
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Note: All NGC Systems include a touch screen and are compatible with the NGC Fraction Collector and BioFrac Fraction Collector.

Specifications (cont.)

Buffer Blending

Standard in the NGC Scout and NGC Discover Systems

Air Sensor Module

Number of sensors	Up to 8 total air sensors (1 for end of sample detection, remaining are buffer)
Placement of built-in sensors	End of buffer, end of sample
Sensing principle	Acoustic

Ordering Information

NGC Medium-Pressure Chromatography Systems

NGC Quest Chromatography Systems

For the all-purpose purification of biomolecules

7880001	NGC Quest 10 System
7880003	NGC Quest 10 Plus System
7880002	NGC Quest 100 System
7880004	NGC Quest 100 Plus System

NGC Scout Chromatography Systems

For rapid scouting of proteins, peptides, and nucleic acids

7880005	NGC Scout 10 System
7880007	NGC Scout 10 Plus System
7880006	NGC Scout 100 System
7880008	NGC Scout 100 Plus System

NGC Discover Chromatography Systems

For method development

7880009	NGC Discover 10 System
7880011	NGC Discover 10 Pro System
7880010	NGC Discover 100 System
7880012	NGC Discover 100 Pro System

NGC System Modules and Accessories

System Pumps

7884002	NGC F100 Pump Module , pkg of 1, includes 10 ml/min system pump kit with necessary tubing and fittings, for creating buffer gradients; for use with the buffer blending valve to generate flow rates of up to 20 ml/min
7884003	NGC F100 Pump Module , pkg of 1, includes 100 ml/min system pump kit with necessary tubing and fittings, for creating buffer gradients; for use with the buffer blending valve to generate flow rates of up to 200 ml/min

Sample Pump

7884004	NGC Sample Pump Module , pkg of 1, includes 100 ml/min sample pump kit with necessary tubing and fittings, for automated large-volume sample application via sample inject valve
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Detectors

7884008	NGC Single-Wavelength Detector Module , pkg of 1, includes UV/conductivity detector kit with necessary tubing and fittings, for nucleotide and protein detection, salt gradient generation
7884009	NGC Multi-Wavelength Detector Module , pkg of 1, includes UV/Vis and conductivity detector kit with necessary tubing and fittings, for simultaneous 4-wavelength monitoring of elution fractions between 190 and 800 nm and salt gradient generation

Mixers

7884018	NGC Mixer Module , pkg of 1, can be extended with 2, 5, and 12 ml barrels for efficient gradient mixing at higher flow rates, for use with all NGC Systems; does not include mixer base or barrels
7884019	NGC F100 Mixer , pkg of 1, 750 µl base and top assembly, included with all 100 ml/min NGC Systems
7884020	NGC F10 Mixer , pkg of 1, 263 µl base and top assembly, included with all 10 ml/min NGC Systems
7884021	NGC F10 Mixer Barrel Kit , pkg of 1, 750 µl extension barrel for F10 263 µl mixer, part of NGC Scout 10, NGC Discover 10 Systems
7884022	NGC F10 Mixer Barrel Kit , pkg of 1, 2 ml extension barrel for F10 263 µl mixer, optional part

7884028

NGC F100 Mixer Barrel Kit, pkg of 1, 2 ml extension barrel for F100 750 µl mixer, part of NGC Scout 100, NGC Discover 100 Systems

7884023

NGC F100 Mixer Barrel Kit, pkg of 1, 5 ml extension barrel for F100 750 µl mixer, optional part

7884024

NGC F100 Mixer Barrel Kit, pkg of 1, 12 ml extension barrel for 750 µl mixer, optional part

Valves

7884010

NGC Buffer Blending Valve Module, pkg of 1, kit includes necessary tubing and fittings for inline buffer preparation and generating pH gradients for quick pH scouting

7884006

NGC Inlet Valve Module, pkg of 1, kit includes necessary tubing and fittings for automated switching between multiple buffers and samples during method development

7884011

NGC pH Valve Module, pkg of 1, kit includes the pH valve kit, pH probe, tubing, and fittings for accurate inline pH measurement

7884012

NGC Column Switching Valve Module (10 ml), kit includes the necessary tubing and fittings to accommodate the most common column types, holds 5 columns or sample loops; for use with F10 systems for quick column scouting, automated multicolumn, and reverse flow applications

7884026

NGC Column Switching Valve Module (100 ml), kit includes the necessary tubing and fittings to accommodate the most common column types, holds 5 columns or sample loops; for use with F100 systems for quick column scouting, automated multicolumn, and reverse flow applications

7884013

NGC Outlet Valve Module, pkg of 1, kit includes necessary tubing and fittings for automated fraction collection of large-volume fractions with up to 12 vessels

7884016

NGC Signal Import Module, pkg of 1, enables analog to digital signal conversion and connection to third-party autosamplers and detectors

Air Sensors

7885017

NGC Air Sensor Module, pkg of 1, kit includes 2 large-bore air sensors for detection of end of buffer and sample to protect against air entering pumps and columns; supports up to 4 large- and small-bore air sensors

7885018

NGC Air Sensor Extension Module, pkg of 1, connects to the base air sensor module to support 4 additional air sensors; does not include any air sensors, optional part

7885020

NGC Small Air Sensor, pkg of 1, includes air sensor to exclude air from system and columns; detects air in small-diameter PEEK Tubing

7885021

NGC Large Air Sensor, pkg of 1, includes air sensor to exclude air from system and columns; detects air in large-diameter PTFE tubing

7885019

NGC Air Sensor Extension Cable, pkg of 1, for placement of air sensors outside air sensor module

Fraction Collectors

17002070

NGC Fraction Collector, 100/240 V, fraction collector compatible with all NGC Systems, includes power cord, rack set (two 13 mm tube racks), tubing, union

7410002

BioFrac Fraction Collector, 100/240 V, fraction collector compatible with all NGC Systems, includes power cord, rack set F1 (2 x flatpack, 13 mm), BioFrac Diverter Valve, fittings kit

7884025

NGC Communication Adaptor, pkg of 1, enables communication with Bio-Rad devices, such as the BioFrac Fraction Collector (#7410002), with the NGC System

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DESIGNED BY YOU BUILT BY BIO-RAD

BIO-RAD



Available on the
App Store



Download the NGC System Tour on the App Store
and use this Augmented Reality (AR) Target to visualize
the NGC System in your lab.

BIO-RAD

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