

Back Pressure Regulators (BPRs)

- ▶ Proven outgassing protection
- ▶ Flow-independent pump preload for greater pump efficiency
- ▶ 5 to 1,000 psi cartridges and assemblies available

Back Pressure Regulators are designed to enhance system performance through outgassing prevention and improved pump check valve efficiency.

Upchurch Scientific® back pressure regulators include:

- ▶ 5 and 20 psi assemblies (replacement cartridges not available)
- ▶ 40, 75, 100, 250, 500, 750, and 1,000 psi cartridges and assemblies
- ▶ PEEK and stainless steel BPR holders
- ▶ High pressure adjustable BPR for pressures between 2,000 and 5,000 psi
- ▶ Ultra low volume BPRs set to 100 and 500 psi (page 154)

For flow control options try the Micro-Metering Valves found on page 147.



Biocompatible Back Pressure Regulator Holder, shown with available Cartridges

APPLICATION NOTE

Small gas bubbles often form as solvent moves from the high pressure of an HPLC column to the low pressure environment leading to the detector. This outgassing can cause erratic baseline readings and loss of sensitivity. Placing an Upchurch Scientific BPR (usually a 40–100 psi) after the detector provides an excellent, low-cost method for reducing this problem by maintaining enough back pressure on the mobile phase to keep gases dissolved in solution.

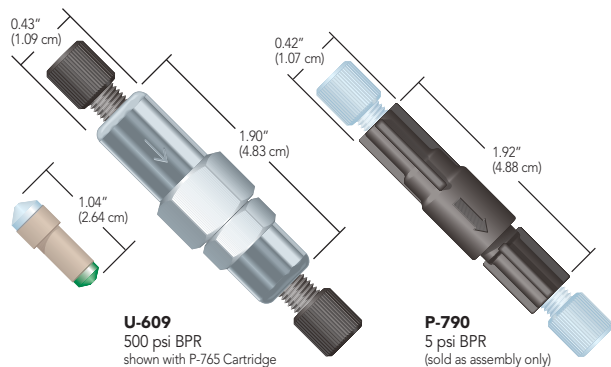
A back pressure regulator can also be used as a pump preload for low and fluctuating pressure applications. Many of today's pumps require a steady back pressure to function properly. Install an Upchurch Scientific BPR (usually 500–1,000 psi) between the pump and the injector to enhance pump performance.

Caution: Do not exceed the maximum operating pressure of your system — please refer to the operating manuals for your system components before choosing the appropriate BPR.

BPR Assemblies

Choose from our line of Biocompatible and Stainless Steel BPR Assemblies, each complete with a replaceable, factory preset cartridge (except the 5 and 20 psi versions).

Upchurch Scientific BPR Assemblies create incremental back pressures ranging from 5 to 1,000 psi (0.3 to 69 bar). The Biocompatible BPR Assemblies feature a PEEK holder; polymer-based fittings; biocompatible BPR cartridges and wrenches for tightening. Stainless Steel BPR Assemblies feature the same biocompatible BPR cartridges with a 316 stainless steel holder and polymer fittings.



Flangeless Nut

Flangeless Ferrule

Cartridge Holder

Cartridge

Color-Coded End Cap

Each BPR Assembly includes a preset BPR Cartridge and Upchurch Scientific fittings for 1/16" OD tubing.

Replacement Back Pressure Regulator (BPR) Cartridges

- Materials of construction: PEEK, ETFE, perfluoroelastomer, and gold-plated stainless steel

These replacement cartridges will operate in any of the standard BPR holders shown on this page. These cartridges create back pressures from 40 to 1,000 psi (2.8 to 69 bar)—all independent of flow except as noted below.

The recommended operating flow rate range for our BPR Cartridges is 0.1 mL–10 mL/min. Within this range, the amount of back pressure created by the BPR Cartridges and Assemblies will not vary more than ±10%. Lower or higher flow rates may result in larger pressure fluctuations.



P-761
40 psi BPR Cartridge



P-796
1,000 psi BPR Cartridge

BPR Holders

Upchurch Scientific® P-465 PEEK and U-469 Stainless Steel BPR Holders work with any of our replacement BPR Cartridges. Each holder comes with fittings for 1/16" OD tubing (see below). The U-469 Holder is surface-treated to prevent galling, a potential problem with large, threaded metal parts.

Please Note: These Back Pressure Regulator Holders are designed to allow each cartridge to operate at its stated pressure setting when tightened to 20 in.-lbs. of torque. To approximate this level of torque, first finger tighten the Holder, then tighten an additional 1/8–1/4 turn with the supplied wrenches.

Pressure Rating 3,000 psi (207 bar)*



LT-115
LiteTouch® Nut
(page 16)

P-250
Super
Flangeless™
Ferrule
(page 21)

P-465
Stainless
Steel
BPR Holder
(cartridge sold
separately)

* Using PEEK tubing and supplied fittings.

Pressure Rating 4,000 psi (276 bar)**



F-300
Two-Piece
Fingertight
Fitting
(page 15)

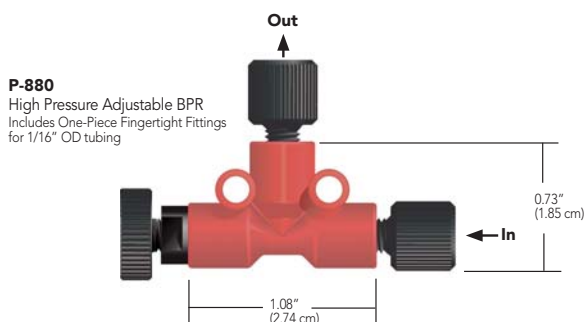
U-469
Stainless
Steel
BPR Holder
(cartridge sold
separately)

** Using stainless steel tubing and supplied fittings.

High Pressure Adjustable BPR

- Materials of construction: PEEK, perfluoroelastomer, and PTFE

The biocompatible P-880 High Pressure Adjustable BPR offers the flexibility to adjust your system back pressure between 2,000 and 5,000 psi (138 and 345 bar), independent of the flow. Only 10% fluctuation in pressure generally occurs with flow rates of 0.1–10 mL/min. Lower or higher flow rates will lead to greater fluctuations in pressure. To achieve the desired back pressure setting, simply turn the thumbscrew while monitoring your system pressure. Because this product creates such high back pressure, please check system component specifications prior to using to avoid damaging any sensitive components.



P-880
High Pressure Adjustable BPR
Includes One-Piece Fingertight Fittings
for 1/16" OD tubing

Part No.	Pressure Setting	Holder Material	Includes	Swept Volume
BPR ASSEMBLIES				
P-790	5 psi (0.3 bar)	PEEK	(2) XP-215	134 µL
★ P-791	20 psi (1.4 bar)	PEEK	(2) XP-215	134 µL
★ P-785	40 psi (2.8 bar)	PEEK	(1) P-761, (2) XP-215	131 µL
★ P-786	75 psi (5.2 bar)	PEEK	(1) P-762, (2) XP-215	131 µL
★ P-787	100 psi (7 bar)	PEEK	(1) P-763, (2) XP-215	131 µL
P-788	250 psi (17 bar)	PEEK	(1) P-764, (2) XP-235	102 µL
P-789	500 psi (34 bar)	PEEK	(1) P-765, (2) P-250, (2) LT-115	96 µL
P-455	1,000 psi (69 bar)	PEEK	(1) P-796, (2) P-250, (2) LT-115	89 µL
U-605	40 psi (2.8 bar)	SST	(1) P-761, (2) XP-201	129 µL
U-606	75 psi (5.2 bar)	SST	(1) P-762, (2) XP-201	129 µL
★ U-607	100 psi (7 bar)	SST	(1) P-763, (2) XP-201	129 µL
U-608	250 psi (17 bar)	SST	(1) P-764, (2) XP-201	99 µL
U-609	500 psi (34 bar)	SST	(1) P-765, (2) XP-201	93 µL
U-610	750 psi (52 bar)	SST	(1) P-795, (2) P-250, (2) LT-115	91 µL
REPLACEMENT CARTRIDGES				
Part No.	Pressure Setting	Body	End-Cap	Swept Volume
P-761	40 psi (2.8 bar)	Tan	Blue	125 µL
P-762	75 psi (5.2 bar)	Tan	Yellow	125 µL
★ P-763	100 psi (7 bar)	Tan	Red	125 µL
P-764	250 psi (17 bar)	Tan	White	95 µL
P-765	500 psi (34 bar)	Tan	Green	89 µL
P-795	750 psi (52 bar)	Black	Blue	87 µL
P-796	1,000 psi (69 bar)	Black	Green	83 µL
BPR HOLDERS				
Part No.	Holder Style	Holder Material	Includes	Swept Volume
P-465	Biocompatible BPR	PEEK	(2) P-250, (2) LT-115	7 µL
U-469	High Pressure BPR	SST	(2) F-300	4 µL
HIGH PRESSURE ADJUSTABLE BPR ASSEMBLY				
★ P-880	2,000–5,000 psi (138–345 bar)	(2) F-120BLK		9 µL