IDEX HEALTH & SCIENCE

Previously known as Upchurch

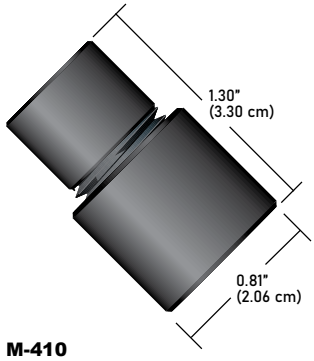
BACK PRESSURE REGULATORS

Back Pressure Regulators (BPR) are designed to enhance system performance through outgassing prevention and improved pump check valve efficiency.
It includes 5 and 20psi assemblies (replacement cartridges not available), a variety of pressure rated cartridges and assemblies, PEEK and stainless steel BPR holders, high pressure adjustable BPR for pressure between 2000 and 5000psi and ultra-low volume BPRs set to 100 and 500psi.

Ultra-Low Volume Back Pressure Regulators (BPRs)

- Wetted flow path materials: PEEK, perfluoroelastomer, and ETFE
- Available pressure settings of 100 or 500 psi (7 or 34 bar)
- Low swept volume of only 6 µL

Our Ultra-Low Volume Back Pressure Regulators (BPRs) were developed to minimize swept volume, which is especially important for multi-detector applications. With a maximum swept volume of only 6 µL*, it is nearly impossible to detect these BPRs as part of your fluid pathway. To minimize the swept volume added to your flow path, we recommend trimming the length of the attached tubing. And because the flow path is completely polymeric, you are assured of biocompatibility.



M-410
MicroVolume BPR Assembly
Attached tubing not shown

Please Note: Our Ultra-Low Volume Back Pressure Regulators cannot be used as check valves due to their unique internal design. Try our Micro-Volume Inline Check Valve on page 137.

** The maximum internal swept volume listed above is for the back pressure regulator only and does not include the volume of the attached tubing lines.*

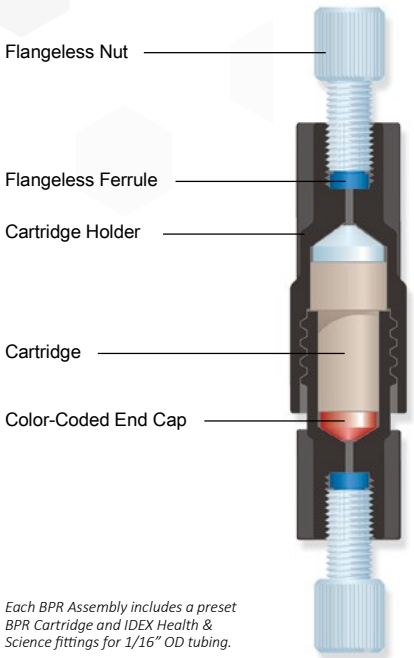
SPECIFICATIONS & DETAILS

	Back Pressure Setting psi (bar)	Flow Rate Recommendations	Recommended Pressure Range psi (bar)	1/16" OD Tubing
M-410	100 [2] (7)[3]	Optimal: 100 µL–1 mL/min Max.: 4 mL/min	40–150 (3–10)	PEEK, 0.010" ID
M-412	500 [2] (34)[3]	Optimal: 100 µL–1 mL/min Max.: 4 mL/min	250–525 (17–36)	PEEK, 0.010" ID
M-420	100 [3] (7)[3]	Optimal: 3–8 mL/min Max.: 10 mL/min	40–150 (3–10)	PEEK, 0.020" ID

[1] All data generated using water at room temperature.
[2] Set at a flow rate of 0.5 mL/min.
[3] Set at a flow rate of 5 mL/min.

Part No.	Description	Pressure Setting	Tubing OD	Includes	Swept Volume	Qty.
ULTRA-LOW VOLUME BPRs						
M-410	Low Flow	100 psi (7 bar)	1/16"	XP-230	6 µL	ea.
M-412	Low Flow	500 psi (34 bar)	1/16"	XP-230	6 µL	ea.
M-420	High Flow	100 psi (7 bar)	1/16"	XP-230	6 µL	ea.

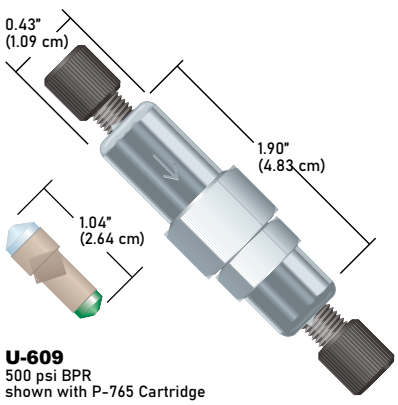
Back Pressure Regulator Assemb



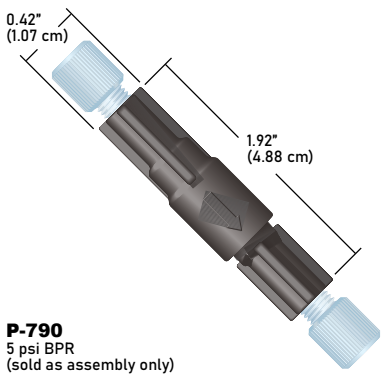
Each BPR Assembly includes a preset BPR Cartridge and IDEX Health & Science fittings for 1/16" OD tubing.

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).

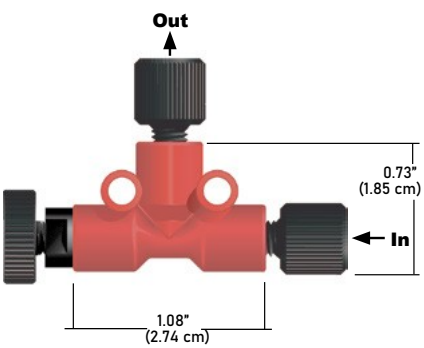
Our BPR Assemblies create incremental back pressures ranging from 5 to 1,000 psi (0.3 to 69 bar). The Biocompatible BPR Assemblies feature a PEEK holder; polymer-based fittings; biocompatible BPR cartridges and wrenches for tightening. Stainless Steel BPR Assemblies feature the same biocompatible BPR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



U-609
500 psi BPR
shown with P-765 Cartridge



P-790
5 psi BPR
(sold as assembly only)



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

High Pressure Adjustable Back Pressure Regulat

› 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.

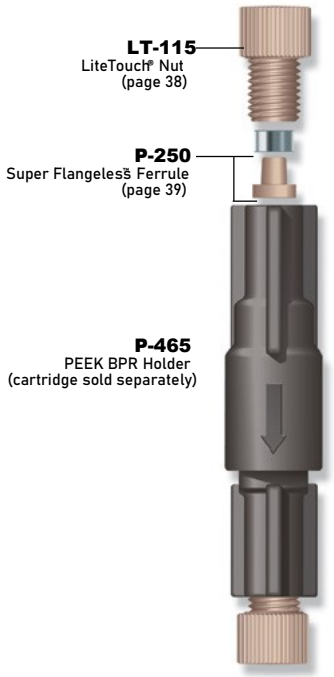
Part No.	Pressure Setting	Holder Material	Includes	Swept Volume	Qty.
BPR ASSEMBLIES					
P-790	5 psi (0.3 bar)	PEEK	(2) XP-215	134 µL	ea.
P-791	20 psi (1.4 bar)	PEEK	(2) XP-215	134 µL	ea.
P-785	40 psi (2.8 bar)	PEEK	(1) P-761, (2) XP-215	131 µL	ea.
P-786	75 psi (5.2 bar)	PEEK	(1) P-762, (2) XP-215	131 µL	ea.
P-787	100 psi (7 bar)	PEEK	(1) P-763, (2) XP-215	131 µL	ea.
P-788	250 psi (17 bar)	PEEK	(1) P-764, (2) XP-235	102 µL	ea.
P-789	500 psi (34 bar)	PEEK	(1) P-765, (2) P-250, (2) LT-115	96 µL	ea.
P-455	1,000 psi (69 bar)	PEEK	(1) P-796, (2) P-250, (2) LT-115	89 µL	ea.
U-605	40 psi (2.8 bar)	SST	(1) P-761, (2) XP-201	129 µL	ea.
U-606	75 psi (5.2 bar)	SST	(1) P-762, (2) XP-201	129 µL	ea.
U-607	100 psi (7 bar)	SST	(1) P-763, (2) XP-201	129 µL	ea.
U-608	250 psi (17 bar)	SST	(1) P-764, (2) XP-201	99 µL	ea.
U-609	500 psi (34 bar)	SST	(1) P-765, (2) XP-201	93 µL	ea.
U-610	750 psi (52 bar)	SST	(1) P-795, (2) P-250, (2) LT-115	91 µL	ea.
HIGH PRESSURE ADJUSTABLE BPR ASSEMBLY					
P-880	2,000–5,000 psi (138–345 bar)		(2) F-120BLK	9 µL	ea.

Back Pressure Regulator Holders

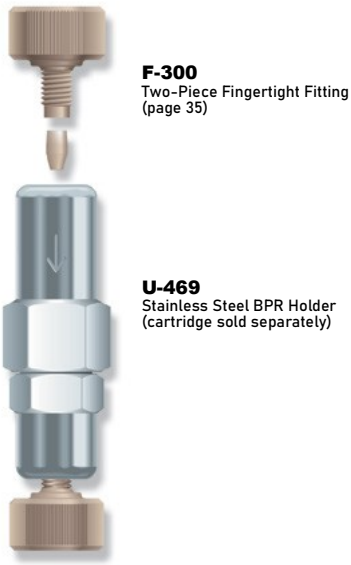
P-465 PEEK and U-469 Stainless Steel BPR Holders work with any of our replacement BPR Cartridges. Each holder comes with fittings for 1/16" OD tubing (see below). The U-469 Holder is surface-treated to prevent galling, a potential problem with large, threaded metal parts.

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)*



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



* *Using PEEK tubing and supplied fittings.*
** *Using stainless steel tubing and supplied fittings.*

Part No.	Pressure Setting	Holder Material	Includes	Swept Volume	Qty.
BPR HOLDERS					
P-465	Biocompatible BPR	PEEK	(2) P-250, (2) LT-115	7 µL	ea.
U-469	High Pressure BPR	SST	(2) F-300	4 µL	ea.

Back Pressure Regulator 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 a 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 IDEX Health & Science 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.

- 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.

IDEX Health & Science 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 144)

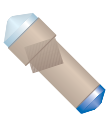
For flow control options try the Micro-Metering Valves found on page 141.

Back Pressure Regulator Replacement 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

COLOR CODING

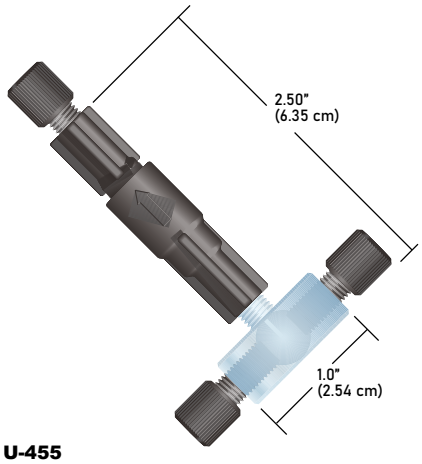
Part No.	Pressure Setting	Body	End-Cap	Swept Volume	Qty.
BPR CARTRIDGES					
P-761	40 psi (2.8 bar)	Tan	Blue	125 µL	ea.
P-762	75 psi (5.2 bar)	Tan	Yellow	125 µL	ea.
P-763	100 psi (7 bar)	Tan	Red	125 µL	ea.
P-764	250 psi (17 bar)	Tan	White	95 µL	ea.
P-765	500 psi (34 bar)	Tan	Green	89 µL	ea.
P-795	750 psi (52 bar)	Black	Blue	87 µL	ea.
P-796	1,000 psi (69 bar)	Black	Green	83 µL	ea.

Pressure Relief Valves

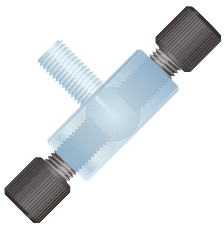
› Prevent system over-pressurization

Our Pressure Relief Valves are ideal for preventing system over-pressurization. These products protect system components by diverting fluid flow automatically when inline pressure exceeds the set limit. Choose between preset 100 psi (7 bar) and 5 psi (0.3 bar) assemblies, both shipped with Flangeless Fittings. The 100 psi version is a good, general purpose valve, while the 5 psi version is perfect for protecting syringe and peristaltic pump systems. The void volume of both relief valves is low due to the small 0.020" (0.50 mm) thru-holes in the valve tee body.

If you wish to have the Pressure Relief Valve open at a different pressure than 5 or 100 psi, simply combine one of the other replacement Back Pressure Regulator Assemblies listed on page 145 with the P-612 Pressure Relief Valve Tee. Choose the P-612S for larger bore tubing and higher flow applications.



U-455
Pressure Relief Valve
Includes Flangeless Fittings
for 1/16" OD tubing
(Drawing is not actual size)



P-612
Pressure Relief Valve Tee
Includes Flangeless Fittings
for 1/16" OD tubing
(Drawing is not actual size)

Part No.	Description	Pressure Setting	Tubing OD	Includes	Swept Volume	Qty.
PRESSURE RELIEF VALVES						
U-455	Pressure Relief Assembly	5 psi (0.3 bar)	1/16"	XP-201	148 µL	ea.
U-456	Pressure Relief Assembly	100 psi (7 bar)	1/16"	XP-201, wrenches	139 µL	ea.
P-612	Pressure Relief Tee Only		1/16"	XP-201	14 µL	ea.
P-612S	Pressure Relief Tee Only		3/16"	XP-201	348 µL	ea.