Biotage® PRESSURE+ 96

User Manual

Biotage®

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User Manual

CONTENTS

Safety

Intended Use

Biotage PRESSURE+ 96 is intended for laboratory use only and has to be operated by trained professionals. All operations must be performed:

- According to the user documentation delivered with the equipment.
- According to instructions available at www.biotage.com.
- According to instructions given by the technical support staff from Biotage.
- Within limits set by the technical specification.

Failure to follow these instructions and operate within the limits set by the technical specification may result in personal injury and/or equipment damage.

Education, Training, and Competence

It is your responsibility to provide all applicable health and safety regulations to your personnel. You must also ensure that all personnel involved in the operation and maintenance of the equipment fulfill the following criteria:

- Have the necessary education, training, and competence required for the intended use of the equipment.
- Observe general and specific safety regulations for the use of the equipment and its accessories and consumables at all time.

Warranty and Liability

See the “Biotage Terms & Conditions of Sale” document at www.biotage.com.

Service

All service or adjustments must be performed by an authorized Biotage service engineer. Before handing over the unit for service, it should be cleaned from harmful residues as described in the Clean section on page 8.

It is the responsibility of the customer to inform Biotage® 1-Point Support™ representatives if the equipment has been used with hazardous biological, radioactive, or toxic samples and/or solvents, prior to any service being performed. When returning equipment to Biotage, this should be done in accordance with the material return procedures supplied separately by Biotage.

Equipment Safety Standards

PRESSURE+ 96 and its instruction materials are certified by Biotage to comply with:

- CE-Marketing Directive 93/68/EEC
- Machinery Directive 2006/42/EC

Labels

Labels used on PRESSURE+ 96:

In accordance with all the essential requirements of all applicable European product directives; see “Equipment Safety Standards” above.

Consult accompanying user documentation.

Manufacturer.

Safety Requirements

Always keep hands, loose clothing, and long hair away from the manifold when it is moving. Note that slight movement may occur as the unit pressurizes, i.e. when connecting the gas supply.

Many chemicals and samples used with PRESSURE+ 96 can pose chemical, biological, and radiological hazards. You must always understand the potentially hazardous effects of all the materials you work with. To prevent personal injury and/or equipment damage, you must always use impermeable gloves, chemical safety goggles, and protective clothing, follow all generally-accepted lab safety procedures and applicable laws and regulations, and consult your company’s safety expert for guidance.

PRESSURE+ 96 units are manufactured from aluminum, stainless steel, and plastics. Always clean up spills or overflow immediately.

Installation

Site Requirements

The PRESSURE+ 96 unit should be placed in a laboratory and operated where there is proper ventilation or from inside a chemical fume hood when volatile solvents are used. The PRESSURE+ 96 unit requires a compressed gas supply, and should be located with this in mind.

Table/bench	Flat, stable, and able to support the weight of the unit (11.8 kg/26 lbs). The dimensions of the unit (W x D x H) is 271 x 305 x 325 mm (10.7" x 12.0" x 12.8"). The free space above and behind the bench should be at least 10 cm (4") for ventilation.
Operating temperature	5°C to 40°C (41°F to 104°F), indoor use only
Humidity	Maximum relative humidity of 80% for temperatures up to 31°C (87.8°F), decreasing linearly to 50% relative humidity at 40°C (104°F)
Altitude	Up to 2000 meters

Gas Source

PRESSURE+ 96 operates using a compressed gas both to seal the wells or columns and displace liquid. Whether compressed air or nitrogen is used, or cylinders of purified air or nitrogen, the gas should be free of moisture, particulates, and hydrocarbons. This is essential to prevent sample contamination and general fouling of the manifold.

There are a variety of filters available for the removal of moisture, particulates, and hydrocarbons most commonly found within house gas supply systems. The optimum gas supply (80 psi) is achieved by a regulator positioned between the gas source and the unit. The supplied gas supply installation kit (PPM-GA) provides the parts necessary to make the connection between the gas regulator and the unit.

Minimum pressure	60 psi (4.1 bar)
Maximum pressure	100 psi (6.9 bar)
Optimum pressure	80 psi (5.5 bar)

Unpack and Install

Warning

- The total weight of the package including the unit is 16 kg (35 lbs). Follow regional safety practices when handling, moving, and unpacking shipping boxes and containers.
- Keep hands, loose clothing, and long hair away from the manifold when connecting the gas supply. Slight movement may occur as the unit pressurizes.

Note: Biotage recommend that the boxes and packing materials are retained by the customer in case the unit needs to be transported or stored.

The unit will already have the tubing attached in the back as shown in Figure 1.

1. Open the inner box and remove the smaller boxes. These contain the gas supply installation kit, sealing gasket, etc; check the contents against the packing list on the next page.
2. Gently pull the unit from the box and set the unit on a bench or in a fume hood. See the site requirements above.
3. Using the supplied gas supply installation kit (PPM-GA), plumb the back of the unit to the gas supply (see Figure 1). Refer to the Gas Source section above for gas requirements.
4. Position the unit so that the handle and gauges are facing forward and the gas supply is in the rear. Note that the unit weighs 11.8 kg (26 lbs).

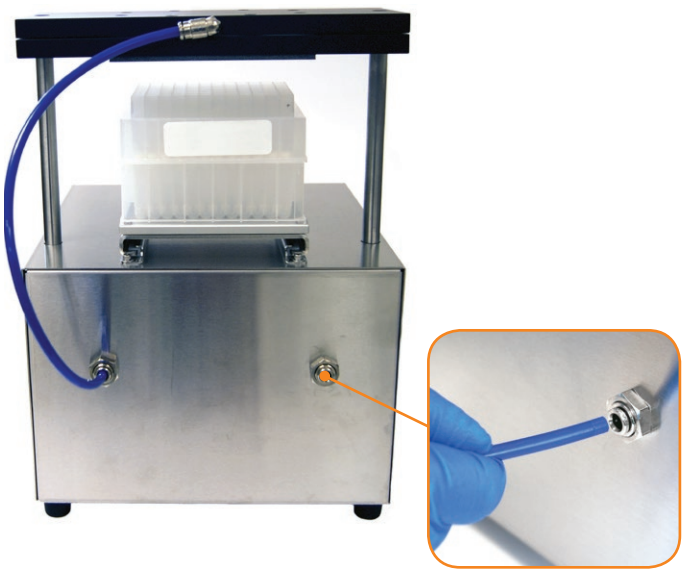

Figure 1. Connect the gas line to the right port at the back of the unit.

Packing List

PRESSURE+ 96 is shipped with the following items:

Part Number	Description	Qty
121-5202	Collection plate, 1 mL Square	1
121-5203	Collection plate, 2 mL Square	1
PPM-A96-1024	PRESSURE+ 96 Collection Tray 10 mL 24 wells (waste plate)	1
PPM-A96-GSKT	PRESSURE+ 96 Sealing Gasket 96 positions (also contains a hex key and 4 positioning screws)	1
PPM-GA	PRESSURE+ Gas Supply Adaptor for all models (6' of 1/8" i.d. polyethylene tubing and 1/8" and 1/4" NPT connectors)	1
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System Description

PRESSURE+ 96 is a positive pressure manifold designed to process 96-well extraction plates using a pressurized gas source.

Load the Plates

PRESSURE+ 96 is compatible with all Biotage 96-well plate designs, including fixed-well plates and modular arrays. 1 mL tabless columns are also supported when processed in combination with the appropriate column holder (PPM-A96-CH).

The extraction plate should sit snugly on top of the collection plate. Note that collection plate should allow for venting of the positive pressure. Standard 1 mL and 2 mL collection plates from Biotage will allow venting when paired with any of the 96-well formats from Biotage.

IMPORTANT: Other manufacturer's collection plates may be used, however, users must ensure that the assembly of extraction plate and collection plate can vent when positive pressure is applied.

The handgrip on the front of the platform helps you to slide the platform with the extraction and collection plates forward and backward under the manifold. Stack the extraction plate onto the collection plate and set the stack onto the sliding platform.

To lower the manifold, push the platform to the back of the track until it reaches the stop point (under the upper manifold), then press down on the two rocker switches on the sides of the unit simultaneously and hold for approximately 3 seconds. This will activate the upper manifold and it will self-adjust to any plate assembly height by lowering and compressing. If you let go too soon, the upper manifold will rise up and you can simply repeat by pressing down on the rocker switches and holding them again for approximately 3 seconds.

To release the plates, press up on both rocker switches, and then slide the plate assembly forward.

Note: The upper manifold is powered by the gas source and the speed is preset and not adjustable.

IMPORTANT: An important safety feature of the unit is the requirement to hold both rocker switches for approximately 3 seconds simultaneously to lower the manifold. This is to keep hands clear of moving parts during compression.

Figure 2. Lower the manifold by pressing down on the two rocker switches simultaneously for approximately 3 seconds.

Flow Control

The PRESSURE+ 96 unit has a two-tier gas delivery system. The flow control switch (B) enables setting and operation of gas flow in addition to turning gas flow on and off:

- **Adjustable Flow Rate (0 to 15 psi, 0 to 1180 mL/min)**
  Recommended for sample loading and elution. By turning the flow control switch (B) to the left to the Adjustable Flow position, gas is channeled through the Adjustable Flow regulator (C) and then through a rotometer (A) controlled by the needle valve positioned at its base. This path through the rotometer provides very precise and slow flow through the wells or columns by limiting gas flow from 0 to 1180 mL/min.

  IMPORTANT: As indicated on the label, never turn the rotometer completely off. Seating the needle valve into its orifice can damage the unit.

- **Maximum Flow Rate (0 to 100 psi)**
  Recommended for washing, drying, etc. By turning the flow control switch (B) to the right to the Maximum Flow position, gas is introduced at the pressure set on the Maximum Flow regulator (D). The pressure range for this regulator is 0 to 100 psi and should be used when processing very viscous or dirty samples.

- **Turn Off the Gas**
  By turning the flow control switch (B) to the OFF position, no gas will flow through the manifold.

  IMPORTANT: The unit should always be in the OFF position during compression and decompression cycles and when not in use. Always shut off the external gas supply when the unit is not in use.

Note: In case of troubleshooting, for each well, with no column in place, the flow at 25 psi should be 354 ± 24 mL/min of flow through each well.

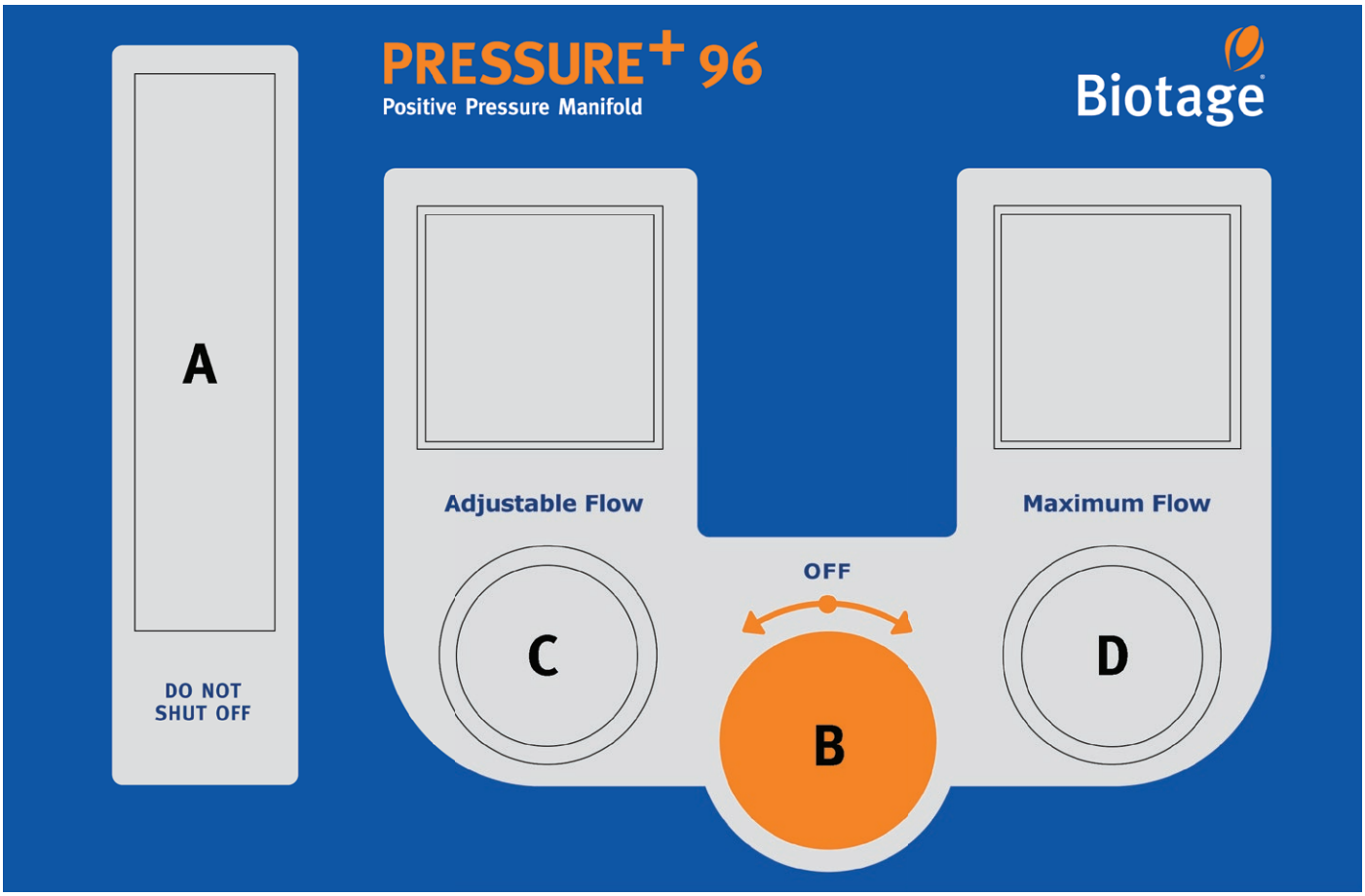


Figure 3. The rotometer (A), flow control switch (B), Adjustable Flow regulator (C), and Maximum Flow regulator (D).

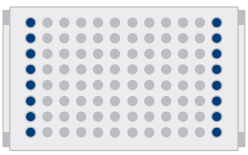
Operation

Warning

- Keep hands, loose clothing, and long hair away from the manifold when it is moving.
- To avoid spillage, ensure to stack the plates properly on the platform.
- To prevent personal injury and/or equipment damage, always use impermeable gloves, chemical safety goggles and protective clothing, follow all generally-accepted lab safety procedures and applicable laws and regulations, and consult your company's safety expert for guidance.

Step-by-Step Instructions

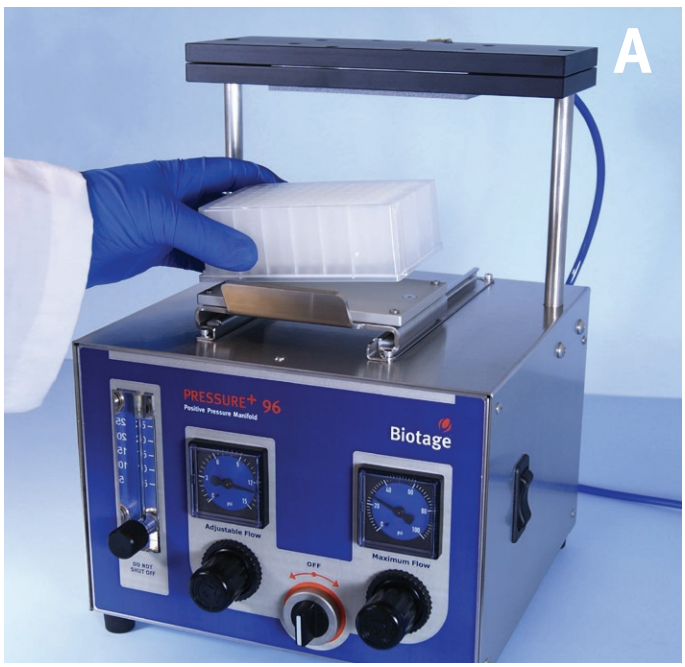
1. Ensure the unit is connected to a gas supply; see Installation section on page 2.
2. Place a 96-well collection plate on the platform; see Figure A.
3. Place a 96-well extraction plate on top of the collection plate; see Figure B.
4. If using a tabless 1 mL column holder, populate with as many columns as required. Note that 1) the columns have to be loaded symmetrically from the outside in so that the pressure head can be positioned horizontally over the column holder to ensure proper sealing, and 2) you have to use all positions in a column in the column holder. In other words, the minimum amount of columns that can be loaded is 16 (see the illustration to the right).

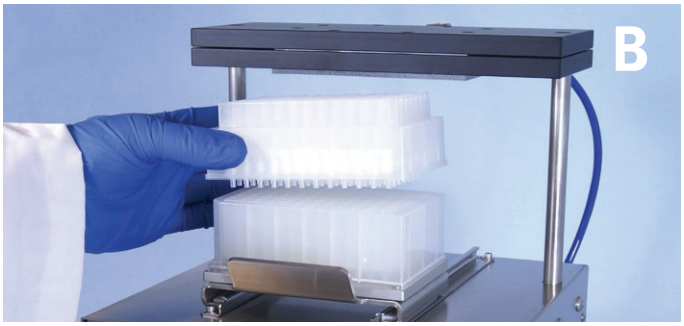


5. Load each well or column with conditioning solvent; see Figure C.
6. Slide the platform back to position the 96-well extraction plate under the manifold; see Figure D.
7. Turn the flow control switch to the left to the **Adjustable Flow** position; see Figure E.
8. Adjust the regulator and rotometer to achieve the desired flow rate; see Figure F and G.

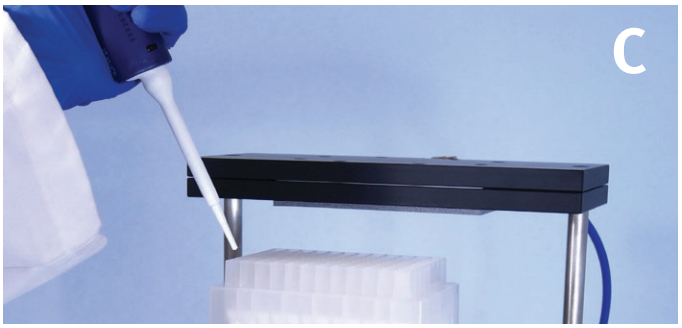
   IMPORTANT: As indicated on the label, never turn the rotometer completely off. Seating the needle valve into its orifice can damage the unit.
9. Lower the manifold by pressing down on the two rocker switches simultaneously for approximately 3 seconds; see Figure H.
10. When liquid has finished flowing, turn the flow control switch to the **OFF** position. See Figure I.
11. Raise the pressure manifold by pressing up on the two rocker switches simultaneously; see Figure J.
12. Pull out the platform.
13. Repeat step 5 through 12 as required for sample application and wash steps.
14. Slide the platform back to position the 96-well extraction plate under the manifold.
15. Turn the flow control switch to the right to the **Maximum Flow** position and adjust the manifold pressure to the desired setting for the drying period; see Figure K.
16. Lower the manifold by pressing down on the two rocker switches simultaneously for approximately 3 seconds.
17. After the sorbent bed is dry, turn the flow control switch to the **OFF** position. See Figure I.
18. Raise the manifold by pressing up on the two rocker switches simultaneously; see Figure J.
19. Pull out the platform and replace the solvent reservoir with a collection plate.
20. Add elution solvent to each well or column.
21. Allow samples to elute by gravity or repeat step 5 through 11 for pressure assisted elution. **Tip:** To trigger gravity elution, slide the platform back to position the plate under the manifold, ensure the flow control switch is in the **OFF** position and then lower the manifold. Raise the manifold after a few seconds.

IMPORTANT: The unit should always be in the **OFF** position during compression and decompression cycles and when not in use. Always shut off the external gas supply when the unit is not in use.

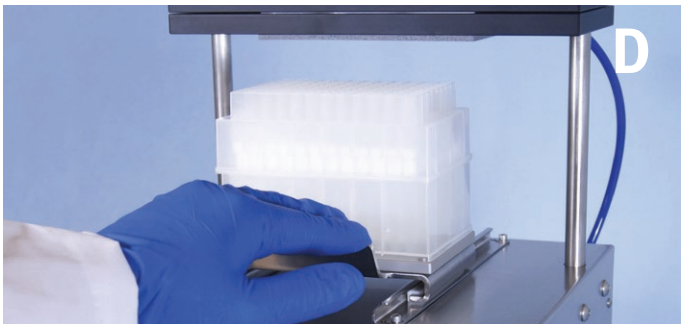


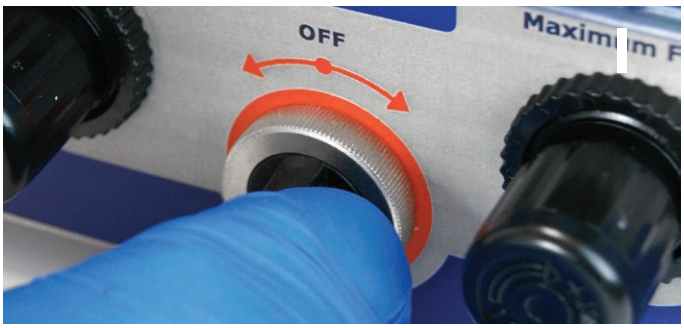

B


G
Adjustable Flow
OFF


C


H
PRESSURE+ 96
Positive Pressure Manifold
Biotage


D


I
OFF


E
OFF


J
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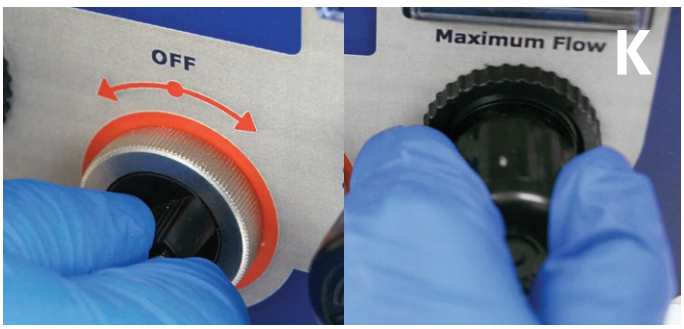
F
Adjustable Flow
OFF


K
OFF
Maximum Flow

Maintenance

Replace the Sealing Gasket

You need a kit with a sealing gasket for 96 positions, a hex key, and four positioning screws (PPM-A96-GSKT), and a Phillips screwdriver (PH2). In order to maintain compliance, only sealing gaskets supplied by Biotage must be used with the unit.

1. Shut off the external gas supply.
2. Turn the unit's flow control switch to the right to the **Maximum Flow** position.
3. When there is no remaining pressure in the unit (0 psi), turn the unit's flow control switch to the **OFF** position.
4. Remove the two 1/4-20 hex screws that hold the upper manifold to the unit (standoffs) using the hex key.
5. Lift the manifold off the standoffs and place it upside down on the benchtop.
6. Remove the old sealing gasket from the manifold and clean the manifold using ethanol.
7. Attach the four positioning screws to the threaded holes on each of the corners of the manifold using a Phillips screwdriver (PH2).
8. Remove the backing of the replacement sealing gasket.
9. Align the holes on the new sealing gasket with the manifold's holes using the positioning screws and adhere the seal.
10. Once the sealing gasket is in place, remove the four positioning screws.
11. Fasten the manifold (with the sealing gasket facing down) to the standoffs using the two hex screws and the hex key.

Note: The adhesive on the sealing gaskets is volatile and cannot be stored for long periods of time at room temperature. For extended storage, place sealing gaskets in refrigerated conditions at 2°C to 5°C (35.6°F to 41°F).

Clean

Materials of construction are primarily stainless steel and anodized aluminum. Other materials include silicone rubber, polyethylene, and polypropylene. Always clean up spills or overflow immediately.

» If you wish to clean the sealing gasket, use a soft cloth, dampened with ethanol or methanol. The sealing gasket is manufactured from silicone rubber.

» To clean the manifold, use a soft cloth, dampened with water. Never spray or apply water directly to the manifold.

Note: The controls and gauges are not solvent resistant.

General Information

Consumables and Accessories

To order consumables and accessories, see contact information on the back of this document or visit our website www.biotage.com.

Part Number	Description	Qty
121-5202	Collection plate, 1 mL Square	50
121-5203	Collection plate, 2 mL Square	50
121-5213	Collection plate, 2 mL Round	50
PPM-A96-1024	PRESSURE+ 96 Collection Tray 10 mL 24 wells-(waste plate)	1
PPM-A96-SPCR	PRESSURE+ 96 Spacer (16mm) for µElution Plates	1
PPM-A96-CH	PRESSURE+96 Tabless 1 mL Column Holder	1
PPM-A96-GSKT	PRESSURE+ 96 Sealing Gasket 96 positions (also contains a hex key and 4 positioning screws)	1
PPM-GA	PRESSURE+ Gas Supply Adaptor for all models (6' of 1/8" i.d. polyethylene tubing and 1/8" and 1/4" NPT connectors)	1

For a complete list, please visit our website www.biotage.com.

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