

Econo-Column[®]
Flow Adaptor
Instruction
Manual

Catalog Numbers
738-0014, 738-0015,
738-0016, 738-0017,

For Technical Service
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Section 1

Introduction

The Econo-Column flow adaptor provides a number of advantages in column chromatography. Specifically, it can be used for

- Sample application with minimal dilution
- Gradient elution without dilution
- Ascending or descending flow
- Limiting the effects of bed expansion with changes in eluant concentration or pH

The Econo-Column flow adaptors are shipped preassembled and ready to use. Figure 1 shows the parts of the assembled flow adaptor. An instruction manual is included, along with an extra o-ring and bed support disc. If any parts are missing or damaged, contact your local Bio-Rad representative immediately

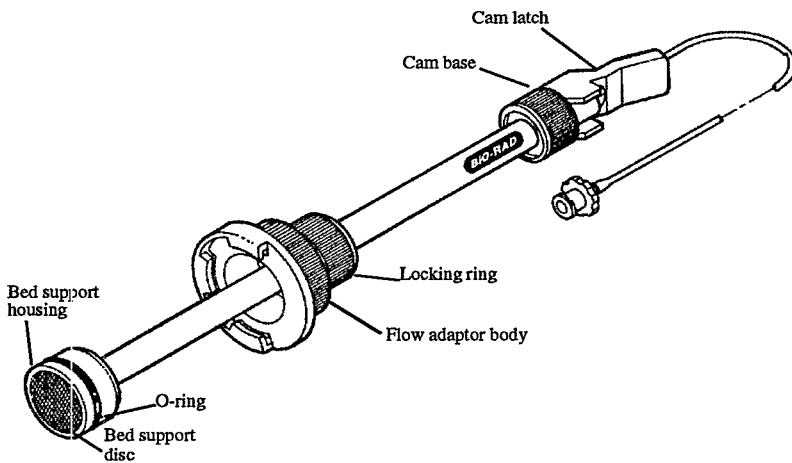


Fig. 1. Econo-Column flow adaptor.

Section 2

Flow Adaptor Description

The new flow adaptor design contains a unique positioning system. A three position cam allows the flow adaptor to be positioned, sealed, and secured in seconds. Figure 2 illustrates the three positions of the cam latch and the effect they have on the o-ring. Position 1 allows the flow adaptor to be freely positioned. Position 2 seals the o-ring against the column wall, yet allows final height adjustment of the flow adaptor. Position 3 completely seals the flow adaptor. The locking ring quickly secures the flow adaptor in position.

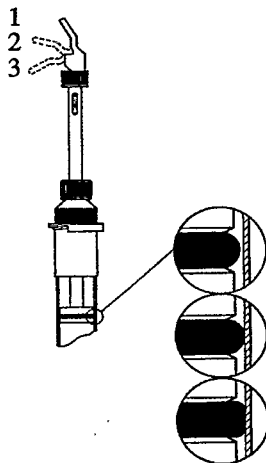


Fig. 2. Three positions of flow adaptor cam latch.

Section 3

Using the Flow Adaptor with Econo-Column or Econo-Pac chromatography columns

3.1 Adjusting the Flow Adaptor

Due to normal tolerances in glass diameters, each flow adaptor should be adjusted to fit to individual columns. This will assure optimal performance. This simple procedure is best done prior to packing the column.

1. Attach the flow adaptor to the column by first pulling the bed support housing up into the flow adaptor body. Secure the flow adaptor body to the column by sliding it onto the yellow flange of the column top. The flow adaptor body should snap into place (see Figure 3). **Warning:** Use caution when handling glass columns. They can break and cause injury.
2. With the cam latch in position 1, insert the flow adaptor into the column until the black o-ring is visible through the glass. If the flow adaptor will not fit into the column, turn the cam latch counterclockwise while holding the cam base. This will loosen the flow adaptor.
3. While holding the cam base, slowly turn the cam latch clockwise until the o-ring begins to engage the glass, then turn it counterclockwise 1/8 to 1/4 turn.
4. The flow adaptor is now adjusted to this column.. This procedure is no longer necessary while this adaptor is used with this column.

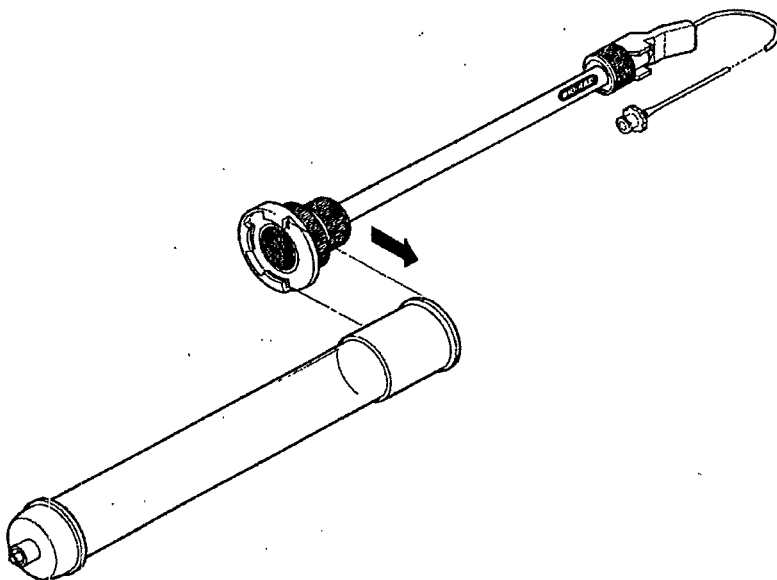


Fig. 3. Flow adaptor insertion.

3.2 Inserting the Flow Adaptor into a Packed Column

1. Using the equilibrating buffer, purge the air from the flow adaptor tubing and rinse the flow adaptor. Purging can be accomplished by attaching a syringe to the female luer lock fitting and injecting buffer into the flow adaptor until all the bubbles are removed.
2. When the gel bed is packed, close the column outlet, leaving about 1 cm (2-3 ml) of buffer above the bed.
3. Attach the flow adaptor body to the column by gently sliding the flow adaptor body across the yellow flange of the column top (Figure 3). (Note: The bed support housing must be pulled up into the flow adaptor body prior to attachment.) **Warning:** Use caution when handling glass columns. They can break and cause injury.
4. With the cam latch in position 1, carefully insert the flow adaptor into the column until it touches the buffer. Avoid trapping air bubbles by slightly tipping the column/adaptor unit, allowing the air to escape.
5. Move the cam latch to position 2.
6. Slowly lower the flow adaptor until it touches the top of the packed gel bed. The o-ring seal should be tight enough to allow the eluant to rise through the adaptor instead of leaking around the seal. This will help clear trapped air in the adaptor tubing. **Note:** Be prepared for the excess eluant which will exit the tube.
7. Move the cam latch to position 3. The o-ring should now be sealed completely against the column. Secure the flow adaptor by turning the locking ring clockwise. If some leakage occurs, the cam latch may need to be tightened. While the cam latch is in position 3, hold the cam base and turn the cam latch clockwise 1/2 turn. Your column is now ready for equilibration.

Section 4 Equilibrating the Column

1. The flow adaptor's 0.8 mm ID silicone tubing comes complete with a female luer lock fitting. Connect the tubing to the eluant reservoir, or the outlet of a pump or injector.

Note: All tubing should be void of air at this stage.

2. Open the column outlet and pass at least 1 bed volume of eluant through the column at a flow rate equal to that which will be used in the chromatographic separation.

3. If bed compression occurs, re-adjust the height of the flow adaptor. Stop buffer flow and close the column outlet. Loosen the locking ring. Release the cam latch to position 2 and properly position the flow adaptor. It may be necessary to disconnect tubing to allow excess buffer to be expelled. Move the cam latch to position 3 and tighten the locking ring. Open the column outlet and start the flow of buffer.

Note: The column outlet should always be closed so the buffer can move freely out of the top of the adaptor.

Section 5

Sample Application

There are a number of methods to apply samples to the column.

5.1 Sample Injection

1. Close the column outlet and attach the sample-containing syringe to the luer fitting.
2. Open the column outlet and slowly inject sample into the tubing.
3. Close the column outlet. Re-establish the connection between the flow adaptor tubing and reservoir tubing. Begin elution. Be careful not to add air.

5.2 Sample Addition via a Stopcock

1. Close the column outlet. Attach a 2-way or 3-way stopcock to the female luer fitting.
2. Couple a small sample reservoir to an available luer fitting on the stopcock. (An empty syringe barrel makes a convenient sample reservoir). For the 3-way stopcock, the third luer fitting may be used to couple tubing from the eluant reservoir.
3. Sample application is achieved by adding the sample to the small reservoir, opening the sampling stopcock, and then the column outlet.
4. After the sample reservoir is drained, eluant flow is effected by switching the stopcock to permit elution from the eluant reservoir.

5.3 Siphoning

1. Close the column outlet and dip the open end of the flow adaptor tubing into the sample container.
2. Open the column outlet to begin sample flow. The sample will be drawn through the tubing and into the column.

3. When all of the sample has entered the tubing, close the column outlet, reconnect the unit to reservoir tubing, and begin elution.

Section 6

Removing the Flow Adaptor

1. Close the column outlet and disconnect the flow adaptor tubing from the rest of the system.
2. Loosen the locking ring and disengage the flow adaptor by moving the cam latch to position 1.
3. Pull the bed support housing up until it is inside the flow adaptor body.
4. Remove the flow adaptor from the column by holding the top of the column while gently sliding the flow adaptor body across the flange of the column top. **Warning:** Use caution when handling glass columns. They can break and cause injury.

Section 7

Specifications

When engaged properly, the Econo-Column flow adaptor will withstand conditions consistent with the performance of the Econo-Column chromatography columns and the Econo-Pac disposable chromatography columns. Econo-Column chromatography columns and flow adaptors may be used in conjunction with the Econo System chromatography workstation.

Table 1. Flow Adaptor Specifications

Maximum pressure	15 psi (1 Kg/cm ²)
pH	1-14

7.1 Solvent Compatibility

20% DMSO

50% MeOH, EtOH, IPA

6 M Guanidine-HCl

2 M Sodium thiocyanate

5% SDS

50 mM DTT

1 M NaOH

1 M HCl

Solutions containing more than 50% water are acceptable.

Section 8

Cleaning and Sanitization

Between uses, the flow adaptor should be rinsed with water and air-dried for storage. Clean external components by first loosening the bed support housing (move the cam latch to position 1) and rinsing the eluant cannula and bed support disc with water. A syringe attached to the flow adaptor via a luer fitting can be used to rinse the inside of the cannula and backflush the bed support simultaneously. Mild laboratory detergent is satisfactory to use as a cleaning agent, followed by thorough water rinsing.

The flow adaptor may be sterilized using ethylene oxide, formalin, alcohol, or 1 M NaOH. Autoclaving is not recommended.

Section 9

Bed Support Disc Replacement

The porous Kynar[®] bed support is press-fitted into the bed support housing. Removal is not necessary for routine cleaning. If the bed support disc becomes clogged with sample, chromatographic media, or particulates from the eluant, and backflushing the flow adaptor is not successful, replacement of the bed support disc is necessary. Remove the clogged bed support disc with a sharp tool and press the new bed support disc into the bed support housing.

Section 10

O-Ring Replacement

The o-ring can be replaced without disassembly. Remove the old o-ring by pulling it over the bed support housing. Slip the new o-ring over the bed support housing.

Section 11

Tubing Replacement

The flow adaptors are shipped with 0.8 mm ID silicone tubing. Depending on the desired application, the following tubing diameters and types may be used with the flow adaptors:

Silicone 0.8 and 1.6 mm ID

Norprene 0.8 and 1.6 mm ID

Teflon 0.8 mm ID

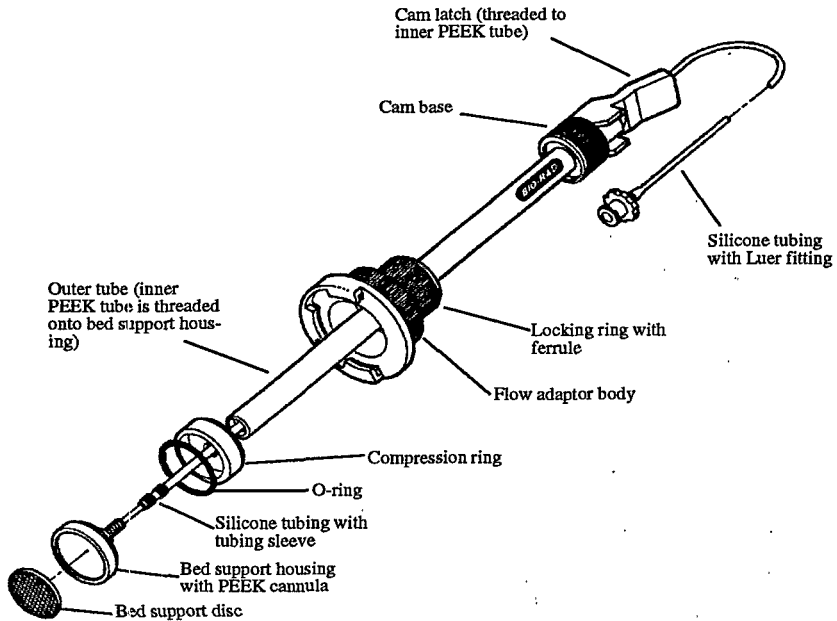


Fig. 4. Assembly with Silicone, Tygon, or Norprene tubing.

PEEK 0.8 mm ID

Tygon 1.6 mm ID

The nature of Tygon makes assembly slightly more difficult.

Section 12 Disassembly

1. Refer to Figure 4. Unscrew the bed support housing by holding the cam base while turning the bed support housing counterclockwise.
2. The tubing is attached to the bed support housing via a PEEK cannula. Two plastic sleeves help to secure the tubing. To remove the tubing, slide the collars up the tubing until they are off the PEEK cannula. **Note:** The tubing collars may have crept up the tubing and may be inside the inner tube.
3. Carefully slide the tubing off the cannula, pulling it out through the top of the cam latch.

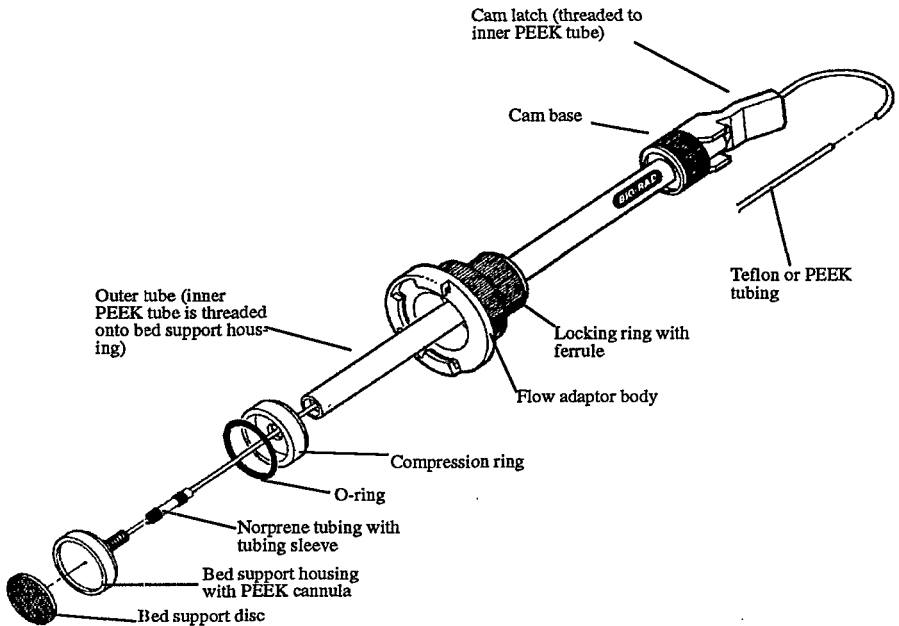


Fig. 5. Assembly with Teflon or PEEK tubing.

Section 13

Assembly with Silicone, Tygon, or Norprene Tubing

1. Thread the new tubing through the cam latch and inner tube.
2. Push the tubing collars over the tubing.
3. Carefully press the tubing over the PEEK cannula. At least 1.5 cm of the PEEK cannula should be inserted in the tubing (Figure 4).
4. Pull the collars down onto the PEEK cannula, over the tubing.
5. With the o-ring and compression ring in place, thread the bed support housing into the inner tube. Do not overtighten. Removing the cam latch makes this step easier.
6. Re-attach the cam latch (if removed in step 5).
7. The cam latch will have to be re-adjusted. Refer to Section 3.

Section 14

Assembly with Teflon or PEEK Tubing

1. The rigid nature of Teflon and PEEK tubing requires a tubing sleeve to join the PEEK cannula of the flow adaptor with the rigid tubing. A 3 cm piece of 1.6 mm ID Norprene tubing is best used for this function. (The tubing is not included.)
2. Push the tubing collars over the tubing sleeve (Figure 5).
3. Carefully press the tubing sleeve over the PEEK cannula. At least 1.5 cm of PEEK tubing should be inserted in the tubing.
4. Pull down one of the tubing collars onto the PEEK cannula.
5. Attach the other end of the tubing sleeve to the rigid tubing in the same manner, using the other tubing collar.
6. Refer to steps 5-7 in Section 13 for re-assembly.

Section 15

Product Information

Catalog Number	Product Description
738-0014	Flow Adaptor , 1.0 cm
738-0015	Flow Adaptor , 1.0 cm
738-0016	Flow Adaptor , 1.5 cm
738-0017	Flow Adaptor , 2.5 cm
738-0018	Flow Adaptor* , 5.0 cm
738-0019	Econo-Pac Flow Adaptor , 1.5 cm
738-0024	Flow Adaptor Maintenance Kit for 1.0 cm , with cam
738-0025	Flow Adaptor Maintenance Kit for 1.5 cm , with cam
738-0027	Flow Adaptor Maintenance Kit for 2.5 cm , with cam
731-8210	Silicone Tubing , 10 meters, 0.8 mm ID
731-8211	Silicone Tubing , 10 meters, 1.6 mm ID
731-8212	Silicone Tubing , 10 meters, 3.2 mm ID
731-8214	Tygon Tubing , 10 meters, 0.8 mm ID
731-8215	Tygon Tubing , 10 meters, 1.6 mm ID
731-8217	Norprene Tubing , 10 meters, 0.8 mm ID
731-8218	Norprene Tubing , 10 meters, 1.6 mm ID
731-8219	Norprene Tubing , 10 meters, 3.2 mm ID
732-8204	Teflon Tubing , 5 meters, 1.6 mm ID

* 5.0 cm Flow Adaptor lacks cam mechanism.

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