# **Superloop** 150 SNAP

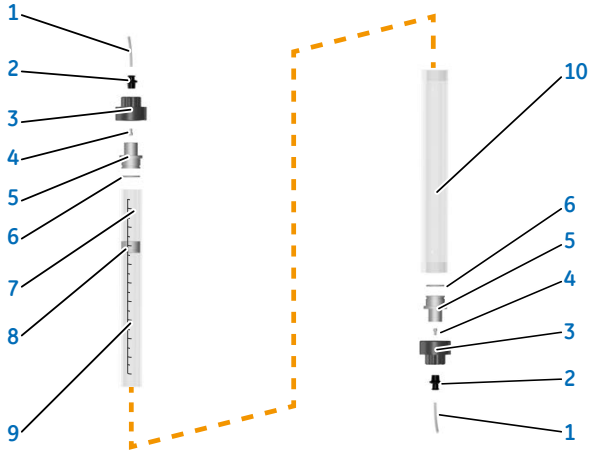
## Introduction

Superloop™ 150 SNAP is a large volume sample loop with SNAP connector fittings for i.d. 3.2 mm tubing. It is recommended for sample volumes of 5 to 150 mL and flow rates of 0.5 to 100 mL/min. The Superloop can be used either for single applications of large sample volumes or for repeated applications of smaller volumes, for example in scouting applications.

Superloop 150 SNAP can be used with all ÄKTA™ chromatography systems that use SNAP connectors for i.d. 3.2 mm tubing.

## Description

Superloop 150 SNAP consists of a graduated glass tube with inner end pieces with fittings for i.d. 3.2 mm SNAP connectors. The glass tube is enclosed in a protective jacket and held in place by outer end pieces screwed on to the protective jacket. The glass tube is divided into a ***sample chamber*** and an ***eluent chamber*** by a movable seal with an automatic spring-loaded valve. The sample chamber is the side closer to the O-ring on the movable seal.

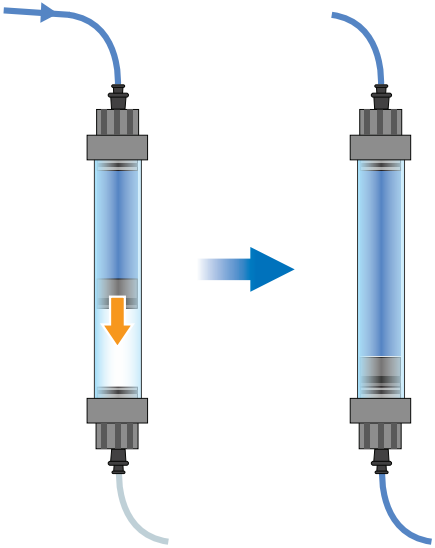


| Part | Description |
|---|---|
| 1 | Tubing |
| 2 | SNAP connector |
| 3 | Outer end piece |
| 4 | Nipple for SNAP connector |
| 5 | Inner end piece |
| 6 | O-ring |
| 7 | Eluent chamber |
| 8 | Movable seal with spring-loaded valve |
| 9 | Sample chamber |
| 10 | Protective jacket |

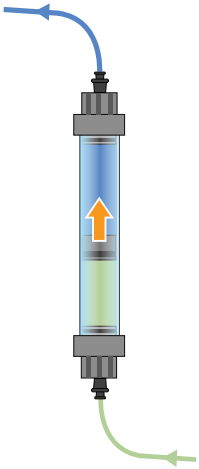
# 1 Operation

The operation of the Superloop is summarized below.

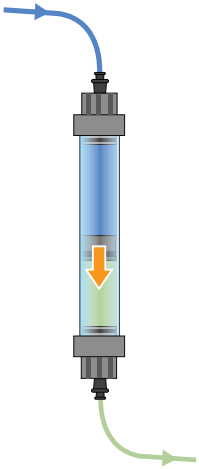
| Stage | Description |
|---|---|
| 1 | The Superloop is primed by filling the eluent chamber with eluent so that the movable seal is at the zero gradation. |

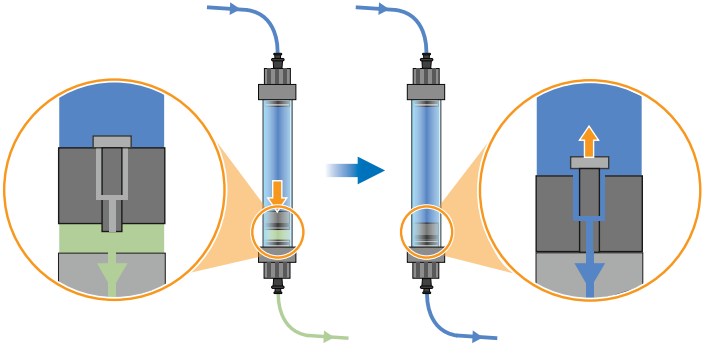


| Stage | Description |
|---|---|
| 2 | Sample is pumped into the sample chamber. The seal moves along the glass tube, displacing eluent from the eluent chamber. |



| | |
|---|---|
| 3 | With the outlet from the sample chamber connected to the column, eluent is pumped into the eluent chamber, displacing sample on to the column. |



| Stage | Description |
| --- | --- |
| | ***Note:***<br>*If the movable seal reaches the end of the glass tube, the spring-loaded valve in the movable seal opens automatically to allow eluent to flow through the seal.*<br>  |

# 2 Specifications

| | |
|---|---|
| Sample volume | 5 to 150 mL |
| Flow rate | 0.5 to 100 mL/min |
| Maximum pressure | 2 MPa (20 bar, 300 psi) |
| Minimum pressure for seal movement | 0.05 MPa (0.5 bar, 7.5 psi) |
| Minimum pressure for valve operation | 0.1 MPa (1 bar, 15 psi) |
| Inner diameter for connected tubing | 3.2 mm |
| Size | 340 × 45 mm |
| Wetted materials | PTFE (polytetrafluoroethylene)<br>EPDM (ethylenepropylenediene monomer)<br>PEEK (polyethyleneetherketone)<br>Borosilicate glass<br>Titanium |

# 3 Using the Superloop

## Precautions

**WARNING**

The maximum pressure for Superloop 150 SNAP is 2 MPa (20 bar). Set the maximum system pressure for the chromatography system to this value or lower.

**WARNING**

**High pressure**. The product operates under high pressure. Wear protective glasses and other required Personal Protective Equipment (PPE) at all times.

**CAUTION**

Do not use a Superloop without its protective jacket. The Superloop may crack if exposed to overpressure.

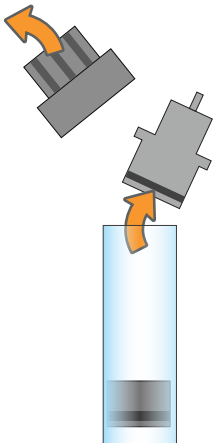
**NOTICE**

Always use Superloop with sample in the sample chamber and eluent in the eluent chamber. The sample chamber is the side closer to the O-ring on the movable seal.

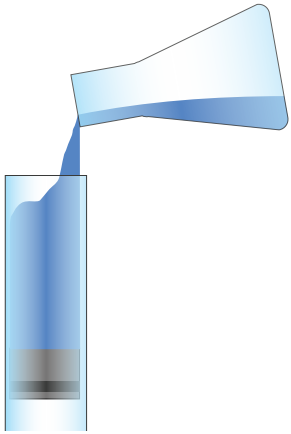
## Prime the Superloop

Follow the steps below to prime the Superloop with buffer.

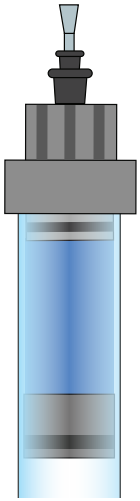
| Step | Action |
|---|---|
| 1 | Unscrew the outer end piece on the eluent chamber and remove the inner end piece. If the end piece is difficult to remove, rock the end piece gently until it is free, or use a spatula to carefully prise the end piece out of the glass tube. Take care not to damage the glass tube or the end piece O-ring. |



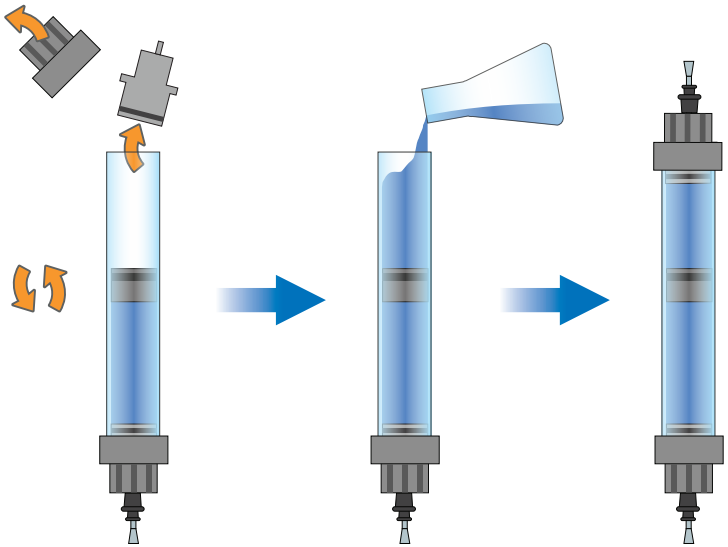
| Step | Action |
|---|---|
| 2 | Fill the eluent chamber with eluent. |



| | |
|---|---|
| 3 | Replace the inner end piece. For optimal performance, make sure there is no air trapped in the Superloop. |
| 4 | Replace the outer end piece. |
| 5 | Close the inlet with a SNAP stop. |



| Step | Action |
|---|---|
| 6 | Turn the Superloop upside down and repeat the procedure to fill the sample chamber with eluent. |



*Result:*

Both sample and eluent chambers are now filled with eluent.

## Mount the Superloop

Superloop 150 SNAP can be mounted on an external holder or on a holder attached to the instrument if space is available. The Superloop outlet should be close to the column inlet to minimize band broadening, particularly for gel filtration applications. Mounting options for different chromatography systems are described in more detail in the respective system documentation.

Connect appropriate tubing to the Superloop inlet and outlet using SNAP connectors. See the chromatography system documentation for a description of how to use SNAP connectors.

## Load the Superloop with sample

Sample can be loaded into the Superloop in one of several ways:

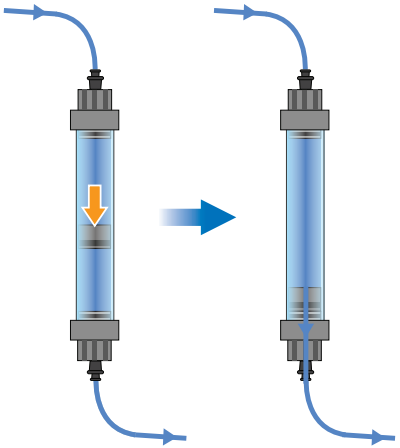
- Load the sample instead of eluent directly into the sample chamber as part of the priming procedure (see *Prime the Superloop, on page 7*). This approach requires that the movable seal is suitably positioned to give a sample chamber of appropriate volume.
- Load the sample through the sample chamber outlet using a syringe or external pump.
- Load the sample using the system or sample pump in the chromatography system if this is supported in the system configuration. This approach can be integrated into a run method in UNICORN software.

***Note:*** *Manual loading using a syringe may require considerable pressure. Make sure that the syringe connections are secure.*

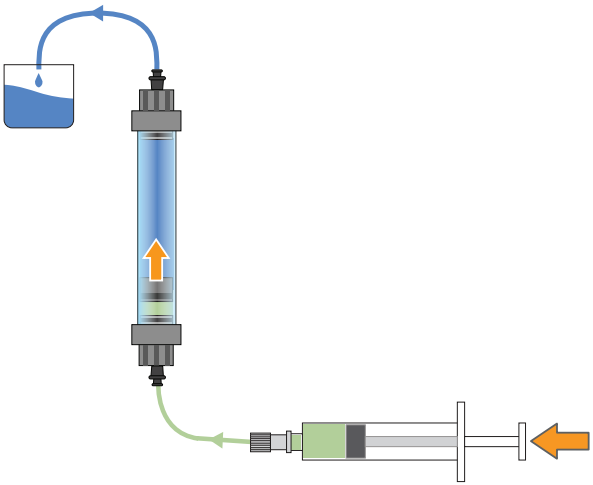
The most suitable approach may vary depending on the amount of sample and the configuration of the chromatography system. See the system documentation for details and recommendations.

The steps below describe the principle of loading a Superloop that has been primed with eluent in both chambers.

| Step | Action |
|---|---|
| 1 | Use an external pump or the chromatography system pump to pump eluent into the eluent chamber to displace all liquid from the sample chamber. The valve in the seal will open and allow eluent flow to continue when the movable seal reaches the end of the Superloop. |



| Step | Action |
|---|---|
| 2 | Stop the eluent flow and connect the eluent chamber inlet to waste. The movable seal valve will close automatically when the eluent flow stops and the pressure is released. |
| 3 | Fill the sample chamber with sample using a syringe or pump. |



| Step | Action |
|---|---|
| 4 | When sample loading is complete, connect the Superloop into the chromatography system flow path. |

**NOTICE**

Always fill sample into the chamber closest to the O-ring on the movable seal. The Superloop will not function correctly if the orientation is reversed.

## Apply sample to the column

Follow the steps below to apply sample to the column. Depending on the system configuration, the procedure may be automated in a method in UNICORN software.

| Step | Action |
|---|---|
| 1 | With the sample chamber outlet connected to the column, pump eluent into the eluent chamber. As the seal moves along the glass tube, sample is displaced from the sample chamber on to the column. |
| 2 | If you intend to apply an aliquot of the sample in the Superloop, switch the Superloop out of the flow path when the required volume has been applied. |
| 3 | If you intend to apply the entire sample in the Superloop, allow flow to continue for a short time to ensure that all sample is washed out of the Superloop. |

# 4 Maintenance

## Cleaning

Follow the steps below to clean the Superloop.

| Step | Action |
|---|---|
| 1 | Disassemble the Superloop as described in *Disassembly, on page 12*. |
| 2 | Wash the parts in cleaning agent (recommended 0.5 M NaOH). |
| 3 | Rinse the parts thoroughly in distilled water and allow to dry. |
| 4 | Reassemble the Superloop as described in *Reassembly, on page 14*. |

Cleaning-In-Place (CIP) is generally not recommended. If CIP is required as a standard operating procedure, create and validate a method that washes and rinses the Superloop by repeatedly reversing the flow.

## Disassembly

Follow the steps below to disassemble the Superloop completely. Refer to *Section Description, on page 1* for identification of parts.

| Step | Action |
|---|---|
| 1 | Unscrew one outer end piece from the protective jacket. |
| 2 | Slide the glass tube out of the protective jacket. |

| Step | Action |
|---|---|
| 3 | Remove both inner end pieces from the glass tube.<br>If the end piece is difficult to remove, rock the end piece gently until it is free, or use a spatula to carefully prise the end piece out of the glass tube. Take care not to damage the glass tube or the end piece O-ring. |
| 4 | Unscrew the remaining outer end piece from the protective jacket. |
| 5 | Use a plastic or metal rod to carefully push the movable seal out of the glass tube. |

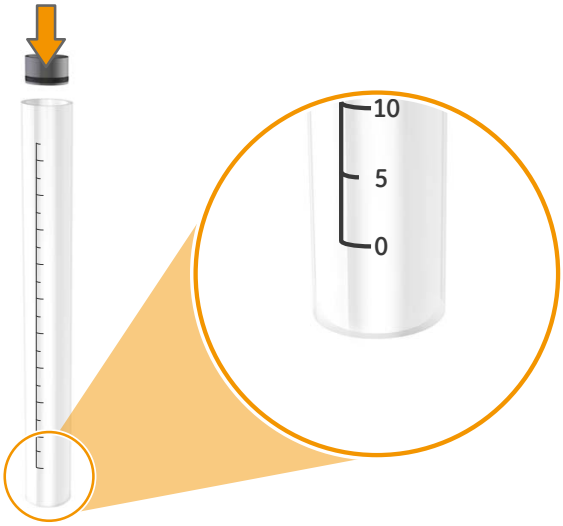
**NOTICE**

Do not unscrew the valve construction in the center of the movable seal. For cleaning, press the valve gently to open it.

## Reassembly

Follow the steps below to reassemble the Superloop. Refer to *Section Description, on page 1* for identification of parts.

| Step | Action |
|---|---|
| 1 | Insert the movable seal into one end of the glass tube, with the O-ring towards the sample chamber. |




| | |
|---|---|
| 2 | Fit the inner end pieces in the ends of the glass tube. Allow the inner end piece to push the movable seal into the glass tube.<br><br>***Note:***<br>*The top and bottom inner end pieces are interchangeable.* |
| 3 | Screw an outer end piece onto one end of the protective jacket. |
| 4 | Slide the glass tube into the protective jacket. The orientation of the glass tube does not matter. |
| 5 | Screw the remaining outer end piece onto the protective jacket, to hold the glass tube in place. |

# 5 Troubleshooting

| Problem | Possible cause | Action |
|---|---|---|
| Flow through valve does not function. | Movable seal inserted in the wrong orientation. | Disassemble and reassemble. |
| Injected volume is less than expected. | Air trapped in eluent chamber. | Prime the Superloop as described in *Prime the Superloop, on page 7*. |

# 6 Ordering information

Spare parts for Superloop 150 SNAP are listed in the table below.

| Part | Part number |
|---|---|
| Movable seal with flow-through valve | 18102958 |
| Outer end piece | 18111861 |
| Glass tube, Superloop 150 mL | 18103220 |
| FEP tubing, i.d. 3.2 mm, 30 m | 29274550 |
| SNAP connector 3.2 | 29274567 |
| SNAP stop plug 3.2 mm | 29274818 |

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29291879 AC V:5 01/2021