SIELC

ALLTESTA™ MINI-AUTOSAMPLER Technical Configurations

Introduction

The Alltesta™ Mini Autosampler, developed by SIELC Technologies, is a compact and versatile robotic device designed for automated liquid sample handling in analytical systems. Its primary purpose is to transfer liquid samples between different components of an analytical or liquid-handling system with high precision and reliability.
Thanks to its proprietary alpha/beta mechanical configuration, the Alltesta™ Mini Autosampler combines compact design, lightweight construction, and flexible architecture, making it ideal for laboratories with limited bench space, mobile applications, and diverse analytical workflows. The system can accommodate a wide range of sample handling needs — from routine testing to complex analyses — while providing efficient, accurate, and reproducible results.

Key Advantages:

Customizable and flexible – hardware options such as valve configurations, tray designs, syringe volumes, needle lengths, vial types, and volumes can be tailored to specific applications. OEM customization also includes custom shapes, colors, and vial capacities.

Versatile applications – functions as a fraction collector, reactor probe sampler, reagent addition and dilution system, microfluidic device loader, or as a delivery system feeding consecutive samples to detectors (such as NMR and MS), minimizing distance to the measurement cell and reducing sample spreading and delay.

Direct control and software flexibility – operated via serial commands with a comprehensive command library; open protocol allows integration with custom software or with SIELC's OEM software.

Compact and space-saving – suitable for small labs or mobile setups. Convenient when the sample introduction point and the analytical instrument must be in close proximity. It can also be placed in a climate-controlled environment where standard liquid-handling devices are too large.

Built-in shaking and sample mixing – ensures sample homogeneity by mixing inside the vial before injection, and can accelerate dissolution or help with simple in-vial treatments. With an optional external pump, reagents can also be added directly to the vial for dilution or quenching steps.

Advanced seqFISH+ support – automates RNA fluorescent marker delivery, manages access to multiple buffers, and ensures accurate fluorescence with optimized fluidic conditions.

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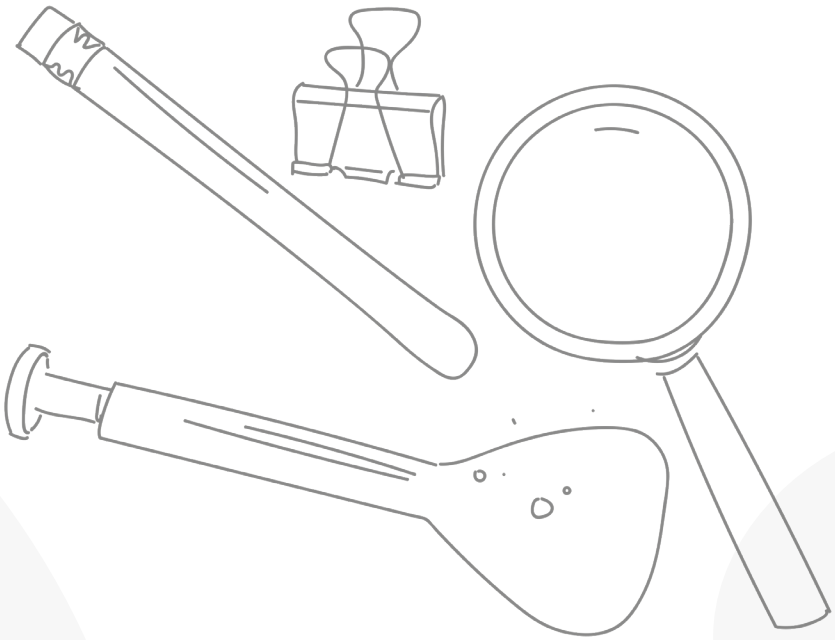


High Pressure HPLC

Configuration

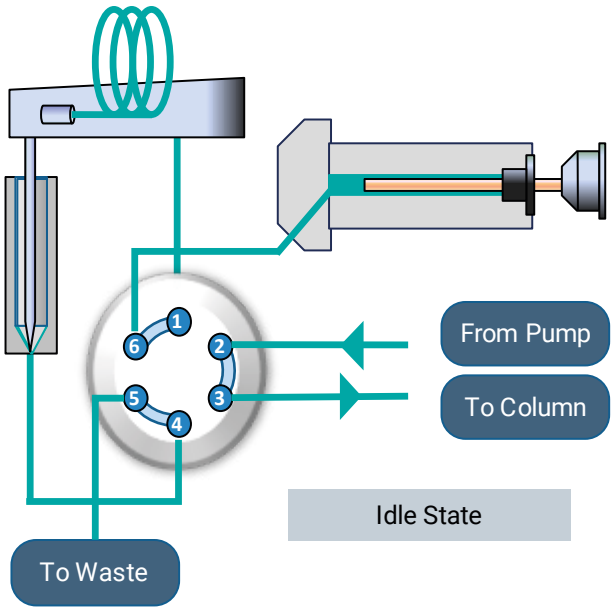
Schematic

Valve: 6x2
Syringe: 120 µL

The Alltesta™ Mini Autosampler allows users to automate sample introduction into a high-pressure line for applications such as HPLC (High-Performance Liquid Chromatography). An accurate sample volume from 1 to 100 µL can be introduced into the high-pressure stream without reducing operating pressure. Additional functions include sample mixing, needle cleaning (with up to four solutions), and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96-well plate.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 2.
2. When the injection is initiated, the needle leaves the port and descends into a sample vial. The syringe pump then draws a programmed volume of sample into the loop behind the needle. The sample volume can be set anywhere between 1 and 100 µL.

1



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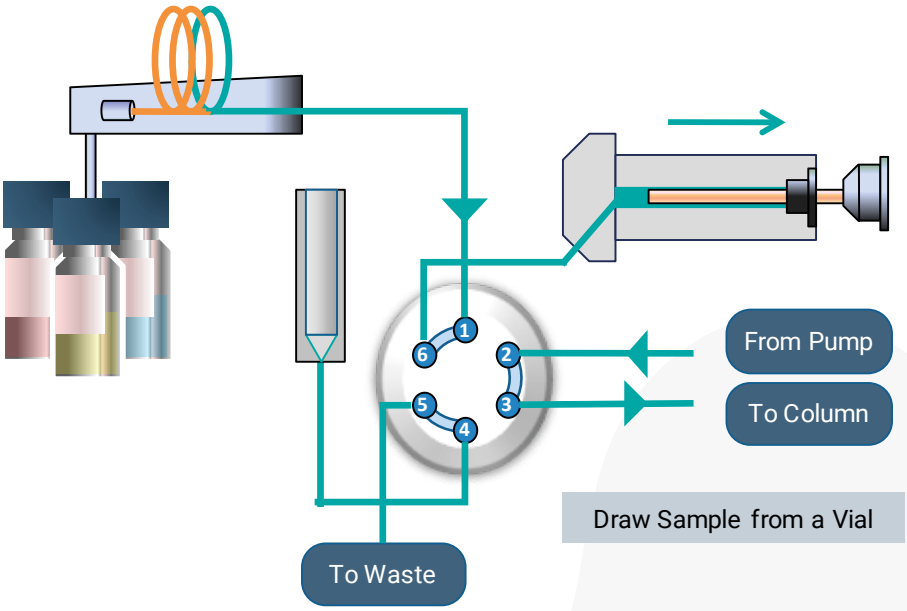


High Pressure HPLC

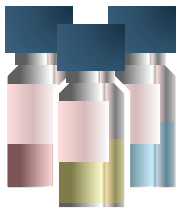
Configuration

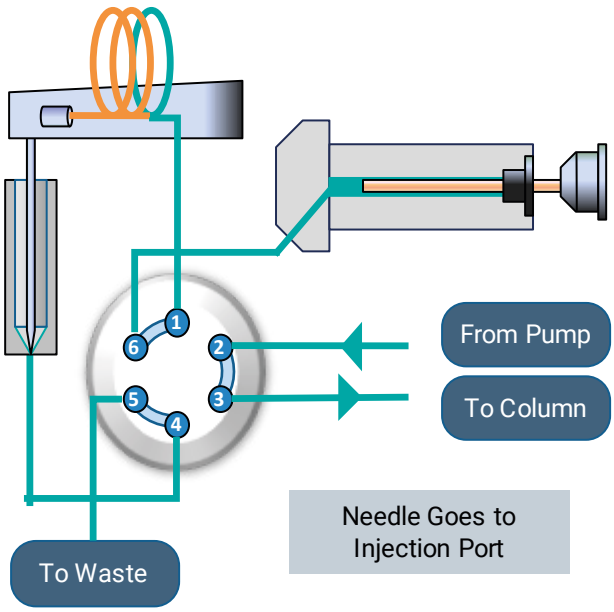
Schematic

Valve: 6x2
Syringe: 120 µL

3. With the sample volume held in the loop, the needle returns to the injection port.
4. The valve switches to Position 1, and the syringe pump pushes liquid into the pressurized flow path towards the column. The valve then switches back to Position 2, returning the system to the idle standby state.

3





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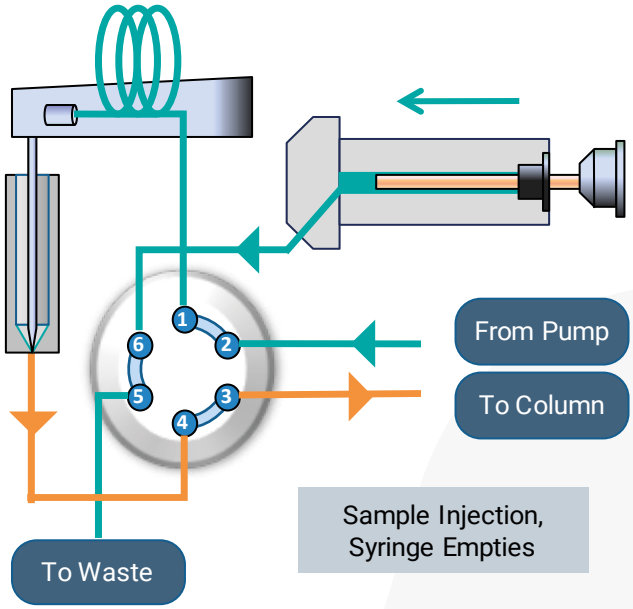


Fraction Collector

Configuration

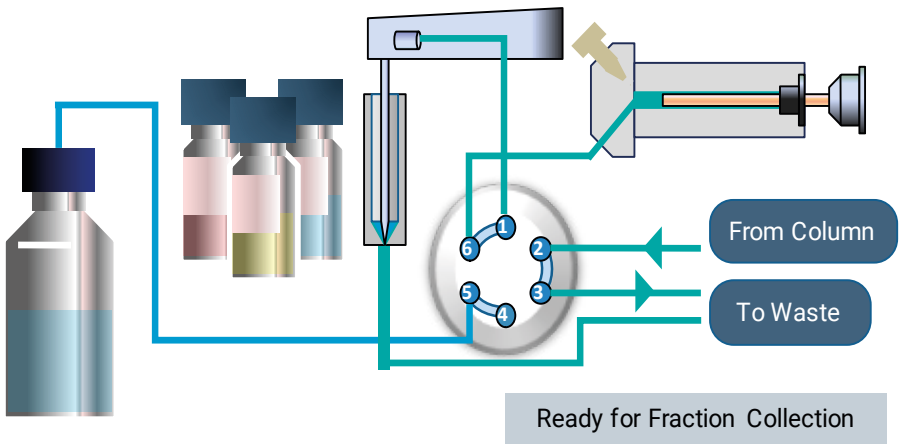
Valve: 6x2
Syringe: 4000 µL

This application allows users to perform fraction collection during column chromatography or any other process that produces liquid flow. Fractions can be defined by set volume or collection time. Several tray options are available for different fraction amounts. Additional functions include fraction dilution or mixing with a reagent, needle cleaning, and flow diverting. The Alltesta™ Mini Autosampler is designed to utilize a 2-valve system to alternate between injection and fraction collection. Here, we focus only on the fraction collection sequence.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 2.
2. When fraction collection is initiated, the needle descends into the first vial, and the valve switches to Position 1. The output from the column passes through the needle into the vial. Meanwhile, the syringe pump draws in washing solution.

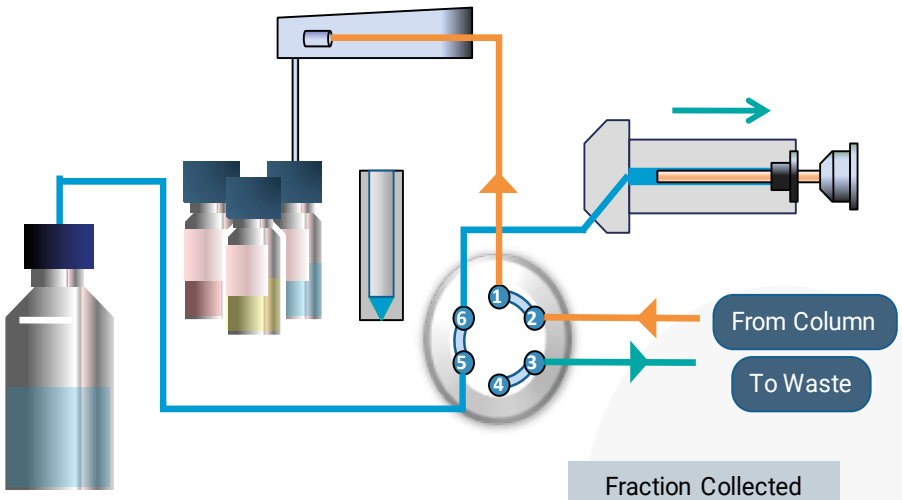
Schematic

1



Ready for Fraction Collection

2



Fraction Collected

Fraction Collector

Configuration

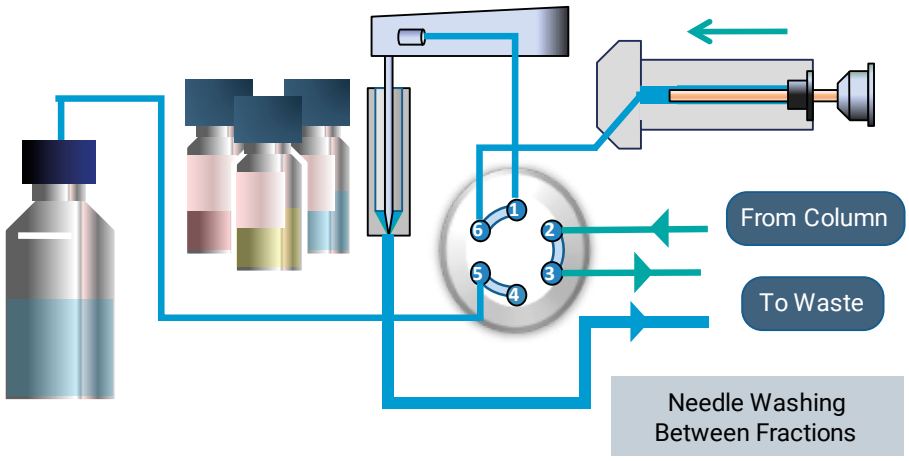
Schematic

Valve: 6x2
Syringe: 4000 µL

3. The needle briefly returns to the injection port while the valve switches back to Position 2. The pump then pushes the washing solution through the needle, directing it through the port and into the waste bottle.
4. The needle descends into the second vial, and the valve switches back to Position 1. The output from the column again passes through the needle into the vial, while the syringe pump refills with washing solution.

Steps 3 and 4 repeat for each subsequent fraction. At the end of the process, the needle returns to its idle state described in Step 1.

3



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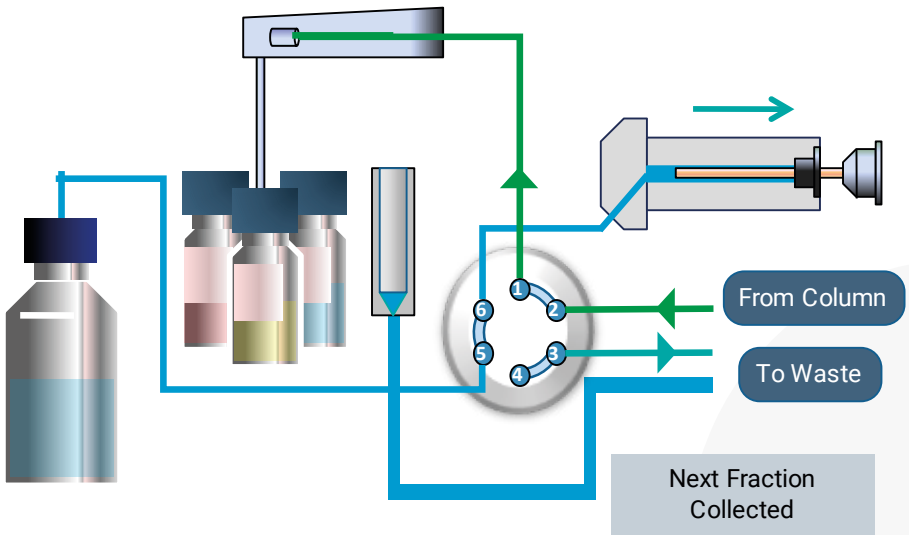


Reactor Sampling Var.1

Configuration

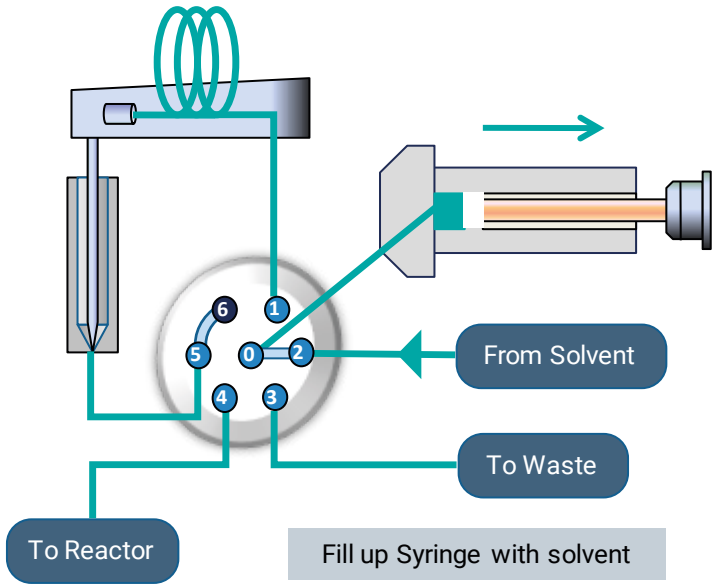
Valve: 7x6
Syringe: 4000 µL

This application allows users to automate sampling from a reactor, fermentor, or similar vessel, or from a line where periodic samples need to be taken and stored. An accurate, user-defined sample volume can be drawn into the loop and then delivered to the appropriate vial. Additional functions include sample mixing, needle and connection line cleaning with a solvent, and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96-well plate.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the empty position, and the valve in Position 2. When sampling is initiated, the pump fills the syringe with solvent.
2. The valve then switches to Position 3, and the pump pushes solvent out of the syringe to purge and clean it, removing any trace impurities from a previous injection and eliminating air gaps in the lines.

Schematic

1



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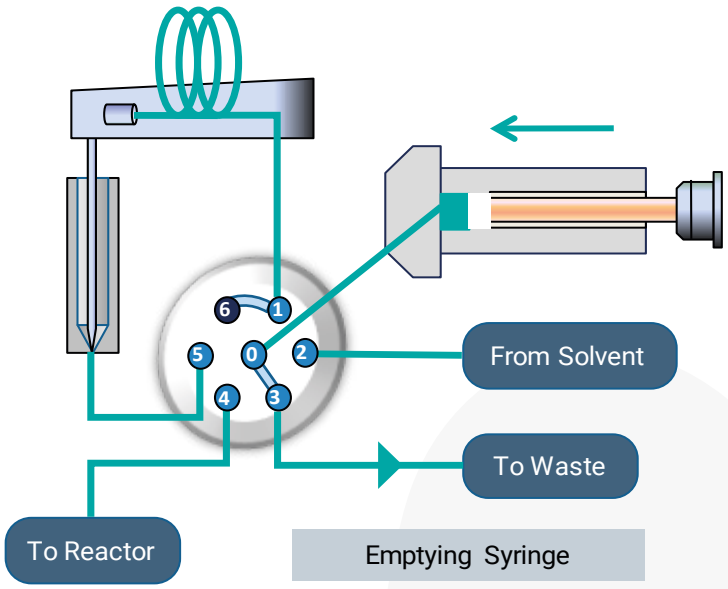


Reactor Sampling Var.1

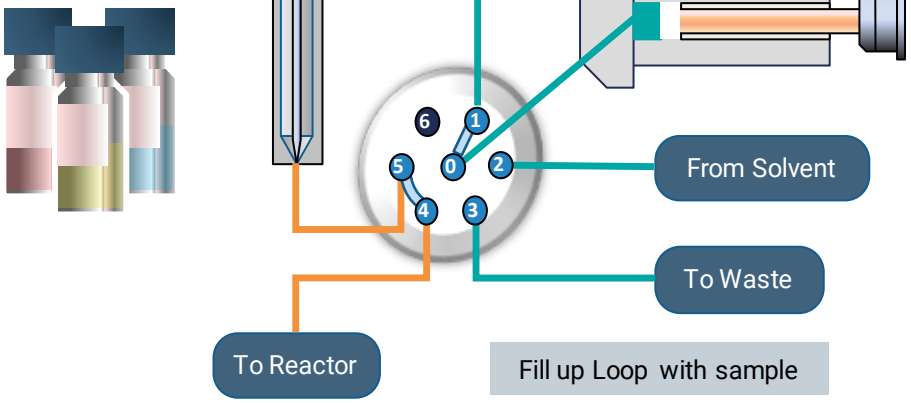
Configuration

Valve: 7x6
Syringe: 4000 µL

3. The valve then switches to Position 1, and the syringe begins to fill the loop with sample from the reactor.
4. The arm with the needle moves to the corresponding vial position, and the syringe delivers the loop content to the vial.

Schematic

3



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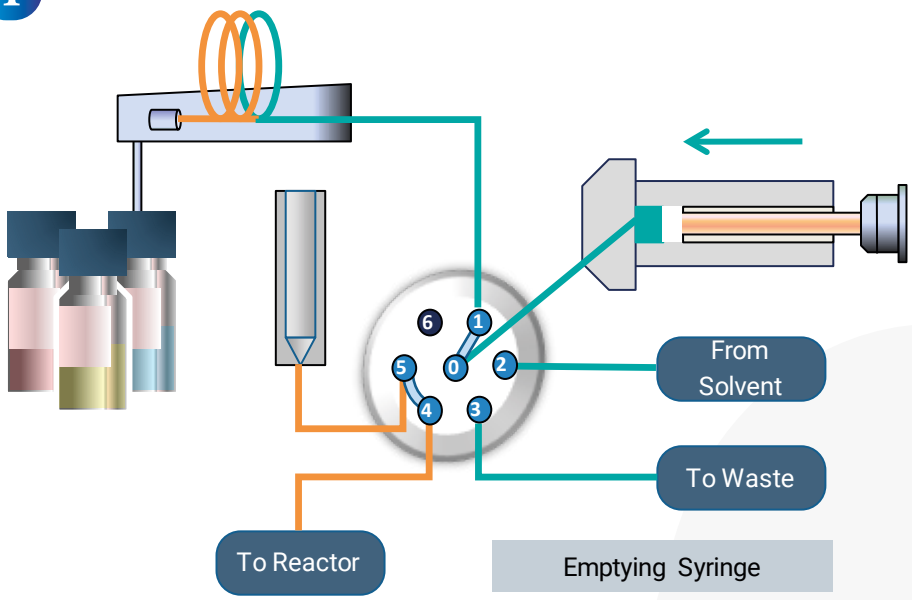


Reactor Sampling Var.1

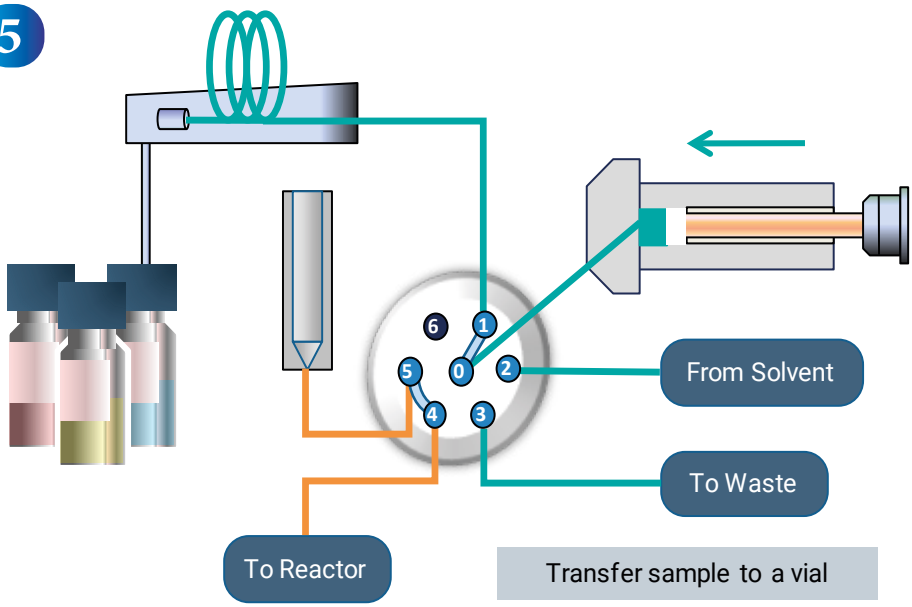
Configuration

Schematic

Valve: 7x6
Syringe: 4000 µL

5. After the sample is placed in the vial, the needle arm returns to the injection port.
6. The syringe rinses the lines with clean solvent back into the reactor to eliminate cross-contamination of samples, if required.
7. If needed, the sample can be shaken in the vial, for example, when mixing with a quench reagent is important for the process.

5



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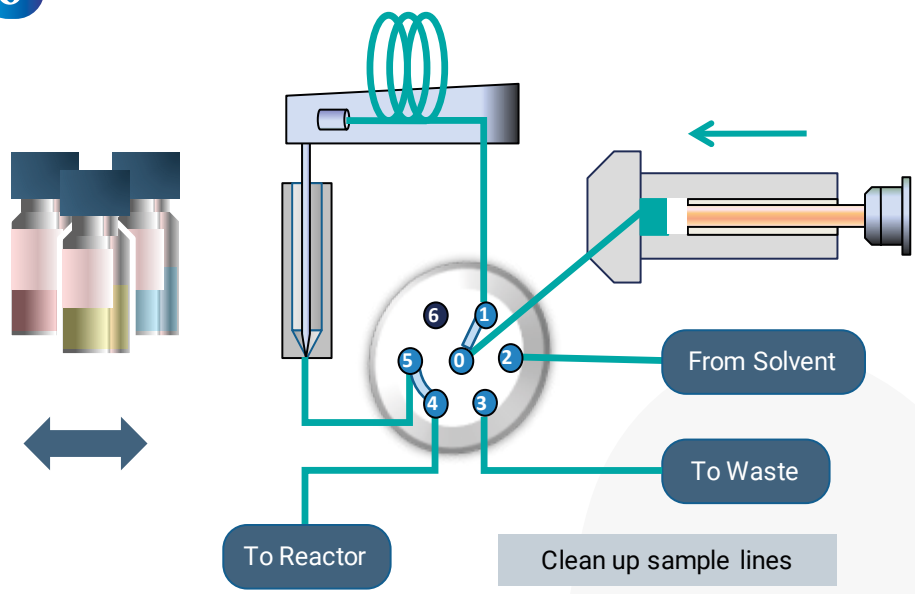


Reactor Sampling Var.2

Configuration

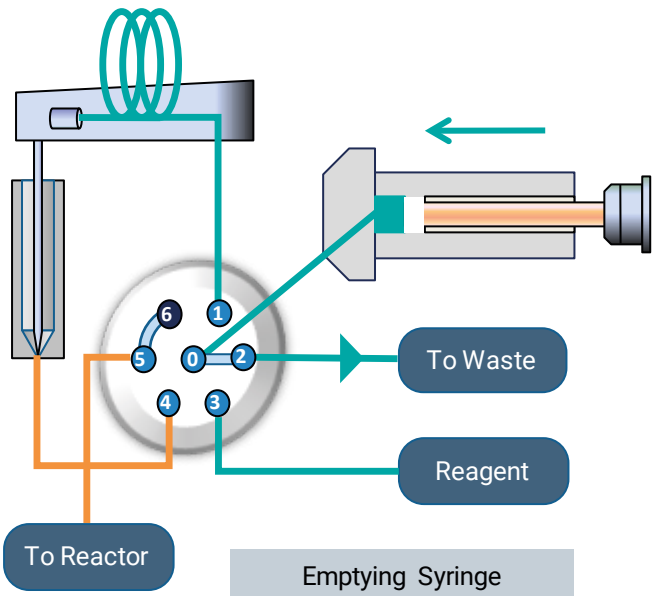
Valve: 7x6
Syringe: 4000 µL

This application allows users to automate sampling from a reactor, fermentor, or similar vessel, or from a line where periodic samples need to be taken and stored. An accurate, user-defined sample volume can be drawn into the loop and then delivered to the appropriate vial. Additional functions include sample mixing, needle and connection line cleaning with a fresh sample or reagent, and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96-well plate.

1. This application begins with the system in its idle state, with the needle in the injection port, the valve in Position 2, and the syringe in the empty position.
2. When probe sampling is initiated, the valve switches to Position 3, and the pump fills the syringe with reagent.

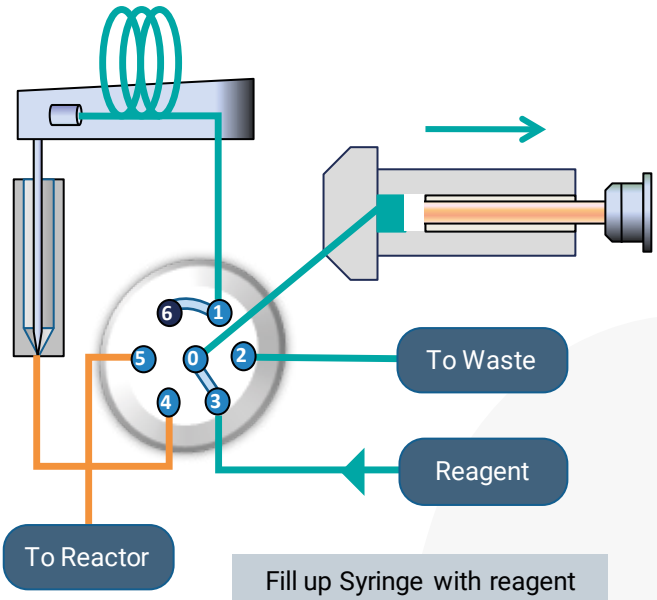
Schematic

1



Emptying Syringe

2



Fill up Syringe with reagent

Reactor Sampling Var.2

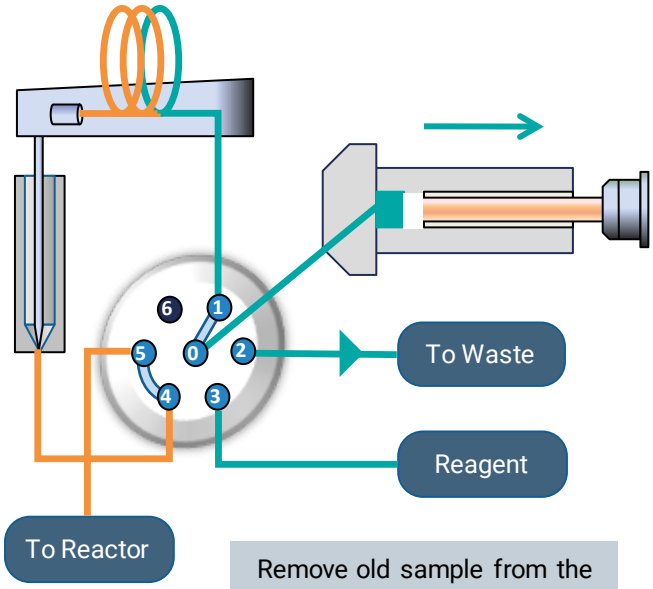
Configuration

Valve: 7x6
Syringe: 4000 µL

3. The valve then switches to Position 1, and the syringe refills with the specified amount of liquid, transferring reactor content into the loop.
4. The valve switches to Position 4, and the pump pushes the loop content out to waste, cleaning it and removing traces of the previous sample.

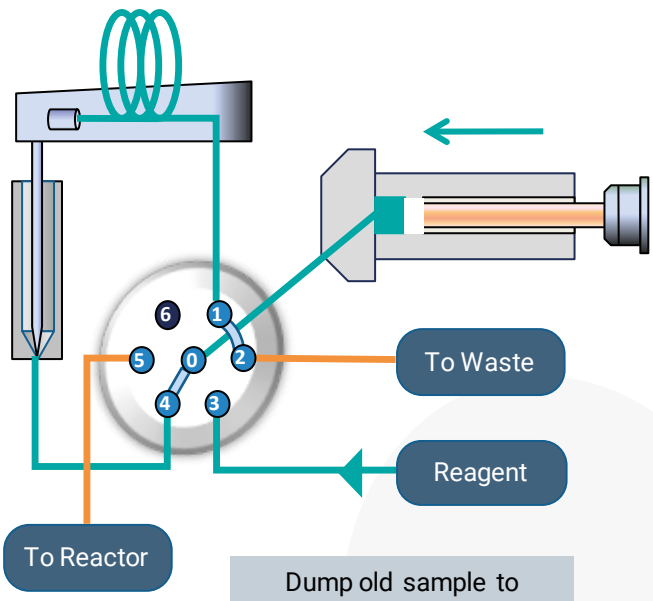
Schematic

3



Remove old sample from the loop, purge lines with fresh sample

4



Dump old sample to waste

Reactor Sampling Var.2

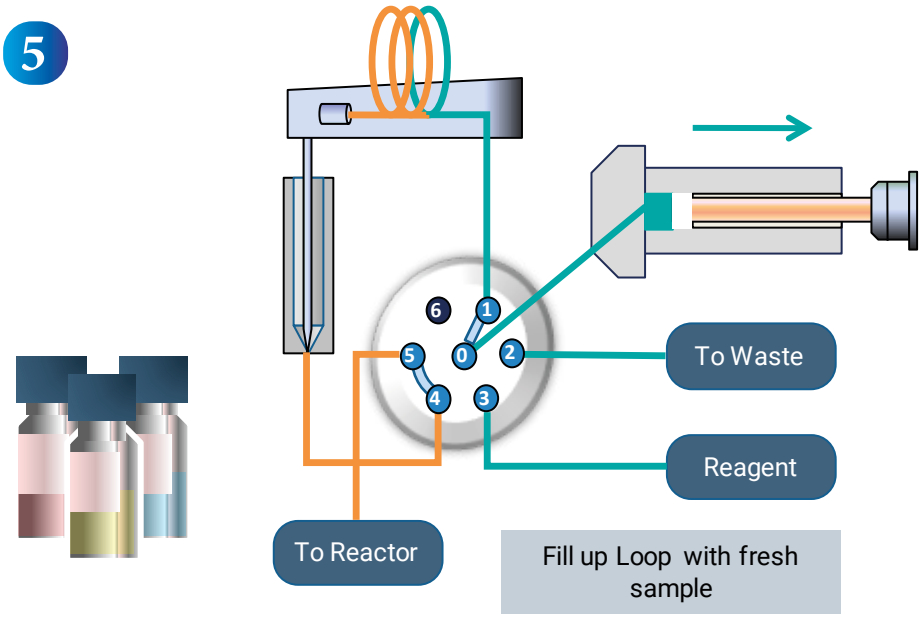
Configuration

Valve: 7x6
Syringe: 4000 µL

5. The valve switches back to Position 1, and the syringe fills the loop with a fresh sample from the reactor.
6. The arm with the needle moves to the corresponding vial position, and the syringe delivers the loop content to the vial. It can also deliver a required amount of reagent to quench the reaction. At this point, the tray can be shaken to mix the sample with the reagent.

Schematic

5



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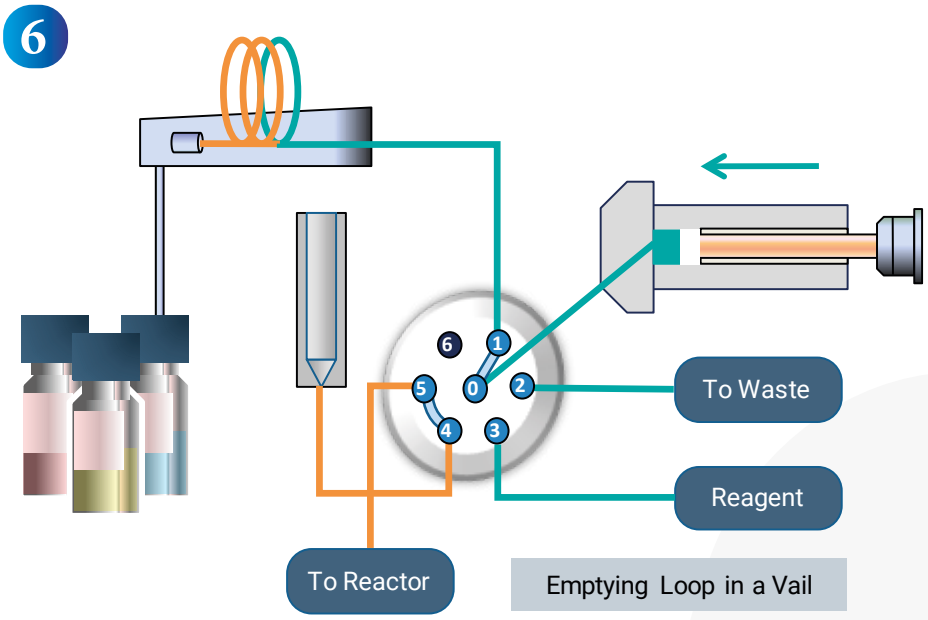


Reactor Sampling Var.2

Configuration

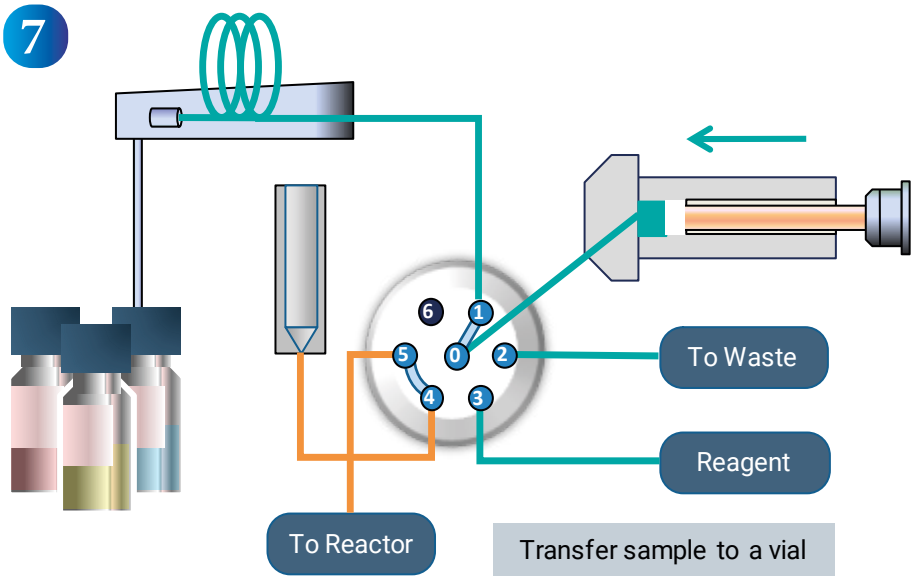
Schematic

Valve: 7x6
Syringe: 4000 µL

7. After the sample is placed in the vial, the needle arm returns to the injection port.
8. The syringe then refills with the required amount of reagent for the next sampling cycle.

Steps 3–8 repeat for each subsequent sampling operation.

7



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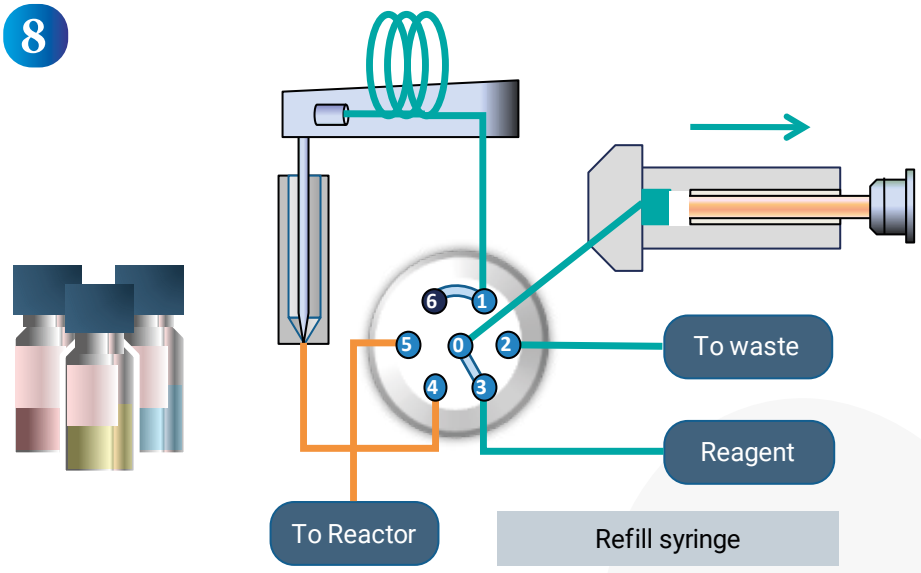


Low Pressure, High Syringe Volume

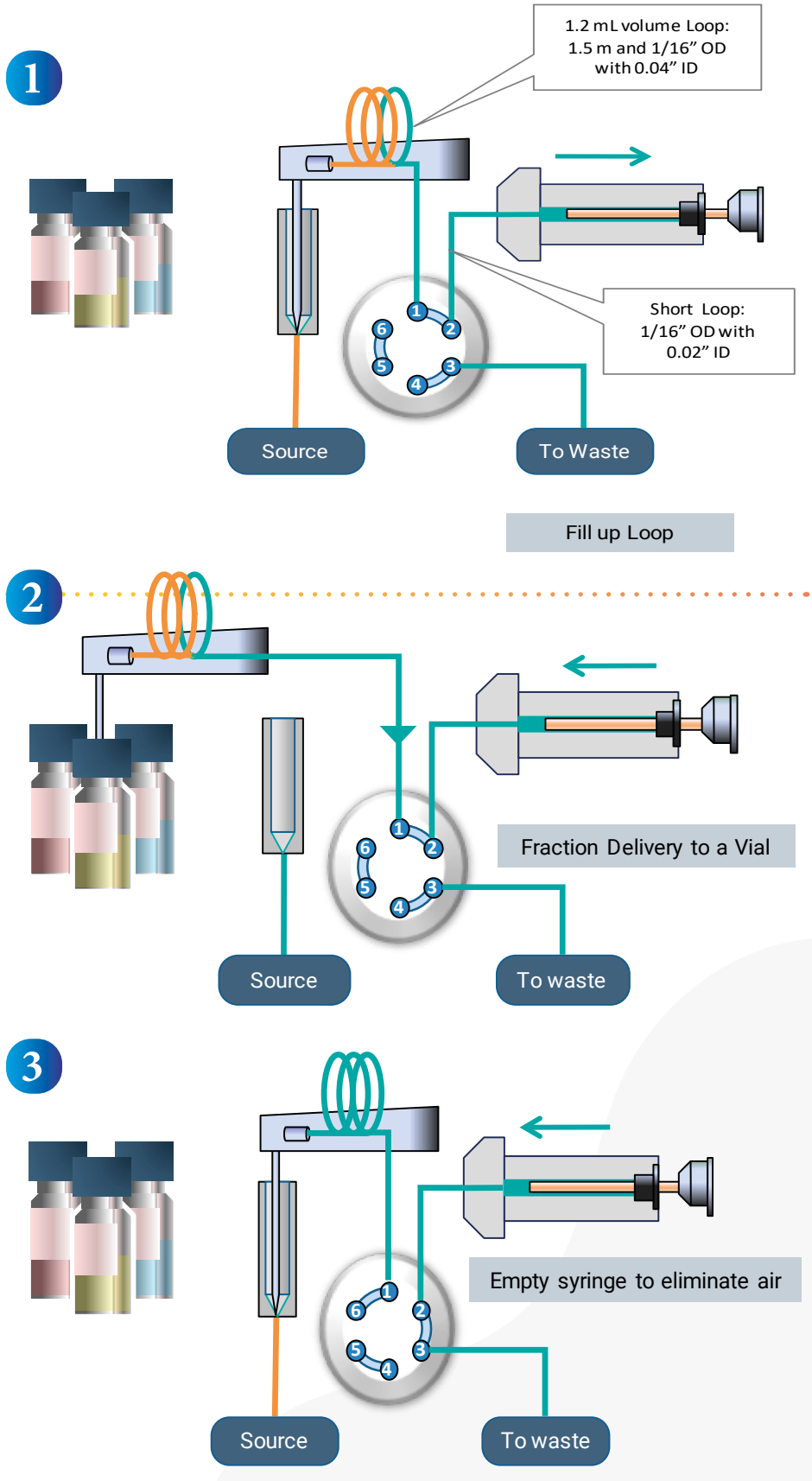
Configuration

Valve: 6x2
Syringe: 4000 µL

This application allows users to automate sample withdrawal and storage for further analysis or as a representative record. An accurate, user-adjustable sample volume can be drawn from a source connected to the injection port via tubing. Additional functions include sample mixing with stabilization solutions or reagents, needle cleaning (with up to four solutions), and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96-well plate. The loop and connection tubing can be customized to different lengths, internal diameters, and volumes.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 2. When collection is initiated, the pump fills the loop with the programmed volume of sample from the source.
2. The needle moves to the designated sample vial, and the pump pushes the sample out of the needle and into the vial.
3. The needle returns to the injection port. The valve then switches to Position 1, while the pump purges any remaining air through the waste line.

Schematic



Small Volume Detector Cell

Configuration

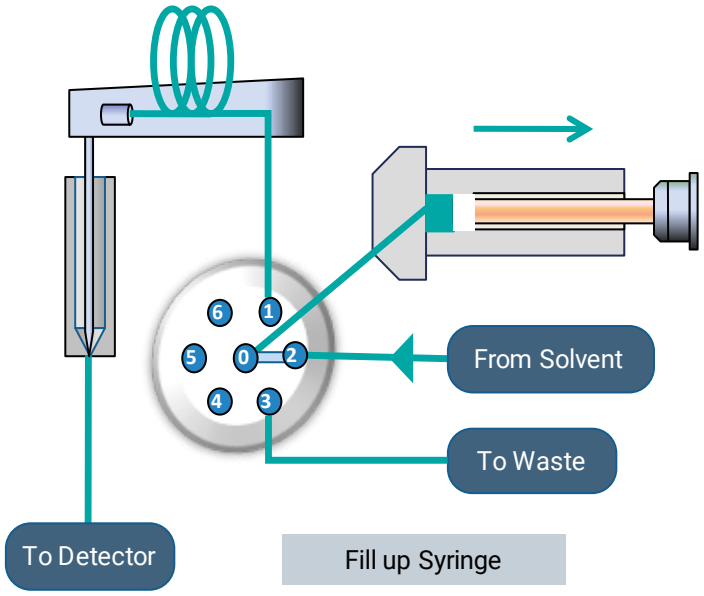
Valve: 7x6
Syringe: 4000 µL

This application allows users to automate sample storage and delivery to a detector cell such as an optical spectrometer, colorimeter, pH meter, conductivity detector, or a similar device. An accurate, user-adjustable sample volume can be delivered to a line connected to the detector cell. Additional functions include sample mixing, needle cleaning (with up to four solutions), and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96-well plate.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 2. When the injection is initiated, the pump fills the syringe with solvent.
2. The valve then switches to Position 3, and the pump pushes solvent out of the syringe to purge and clean it, removing any trace impurities from a previous injection.

Schematic

1



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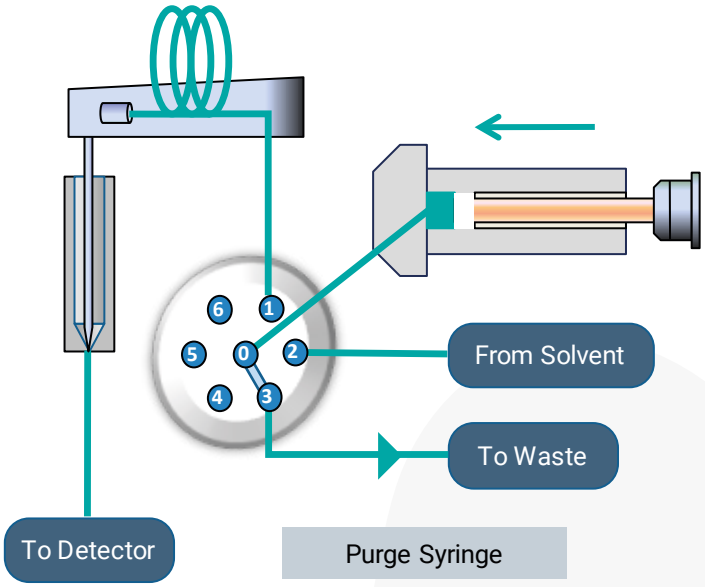


Small Volume Detector Cell

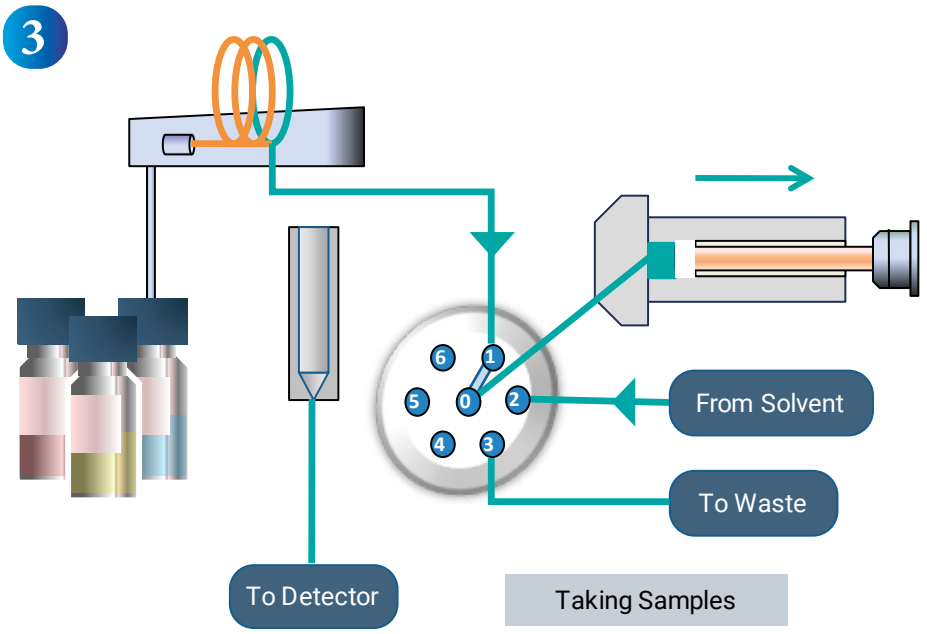
Configuration

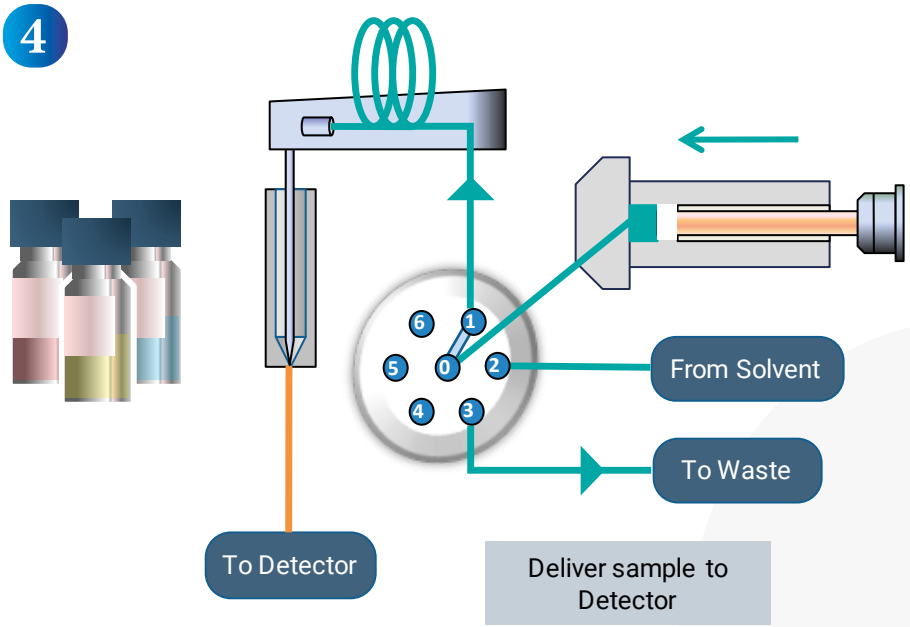
Valve: 7x6
Syringe: 4000 µL

3. The needle descends into the chosen sample vial while the valve switches to Position 1. Once the needle and valve are set, the syringe draws in the programmed sample volume, temporarily holding it in the loop behind the needle.
4. The needle then returns to the injection port. Once the needle is in place, the pump pushes the sample through the port and into the flow path towards the detector.

Finally, the valve switches back to Position 2, returning the system to the idle, standby state.

Schematic





Loading Fluidic Devices

Configuration

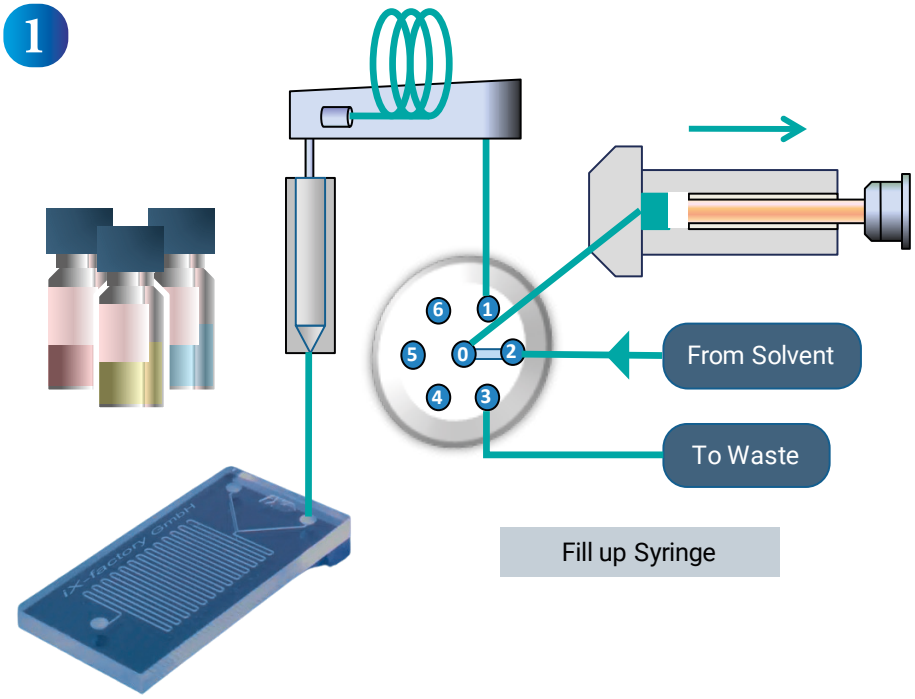
Schematic

Valve: 7x6
Syringe: 120 or 4000 µL

This application allows users to automate sample storage and delivery to a microfluidic device (chip). An accurate, user-adjustable sample volume can be delivered to a line connected to the chip. Additional functions include sample mixing, needle cleaning (with up to four solutions), and sample shaking. Sample storage capacity includes 48 vials (2 mL volume each) or a 96- or 384-well plate.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 2. When injection is initiated, the pump fills the syringe with solvent.
2. The valve then switches to Position 3, and the pump pushes solvent out of the syringe to purge and clean it, removing any trace impurities from a previous injection.

1



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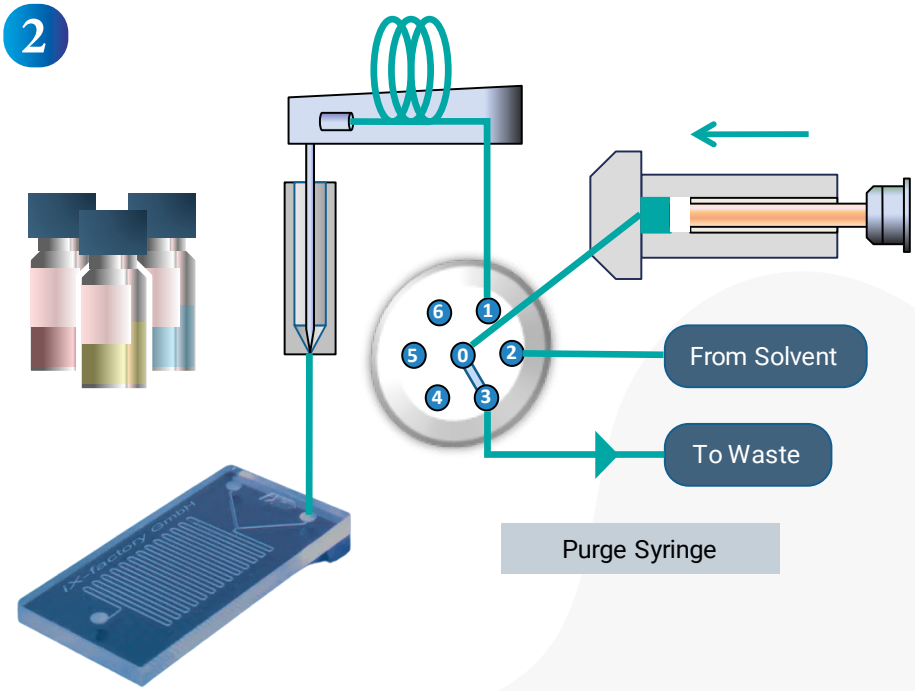


Loading Fluidic Devices

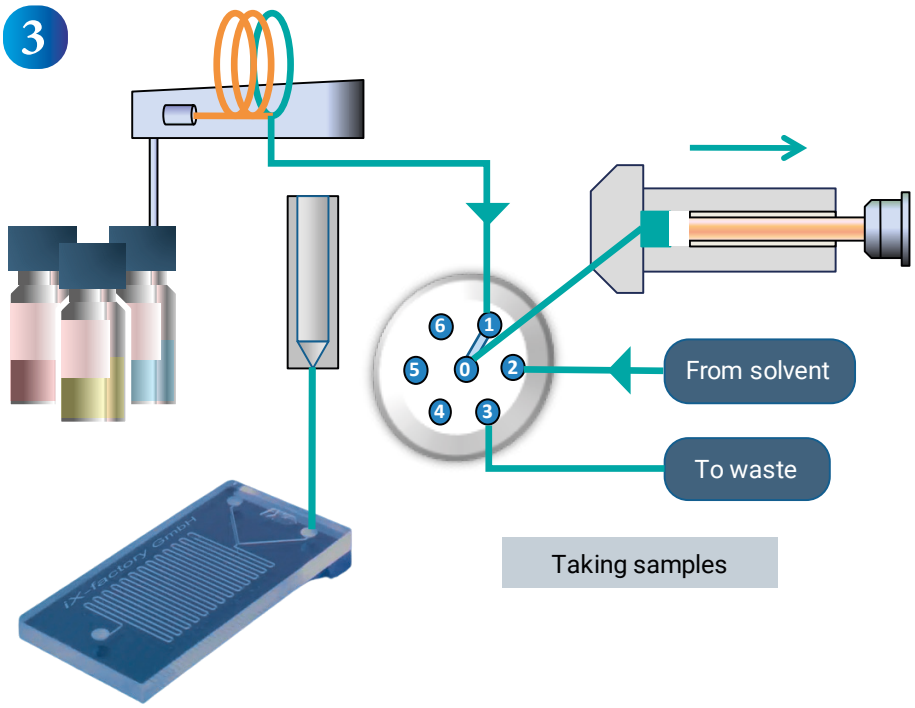
Configuration

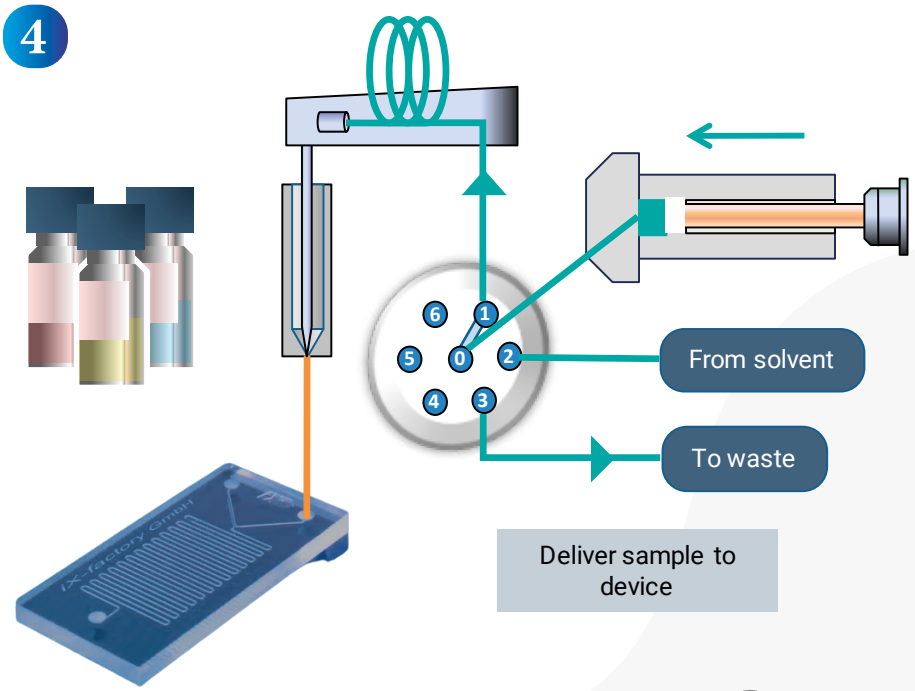
Schematic

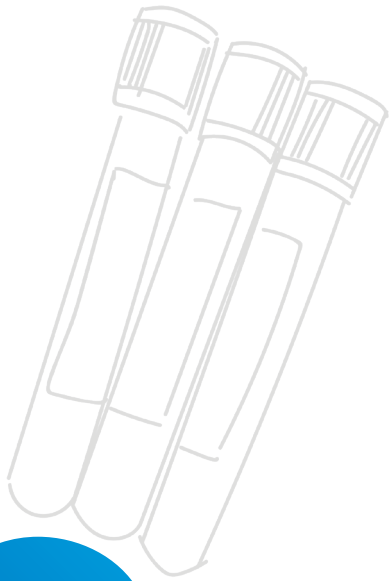
Valve: 7x6
Syringe: 120 or 4000 µL

3. The needle descends into the chosen sample vial while the valve switches to Position 1. Once the needle and valve are set, the syringe draws in the programmed sample volume, temporarily holding it in the loop behind the needle.
4. The needle returns to the injection port. Once the needle is in place, the pump pushes the sample through the port and into the flow path towards the chip.

Finally, the valve switches back to Position 2, returning the system to the idle, standby state.







Sequential Fluorescence in situ Hybridization (seqFISH+)

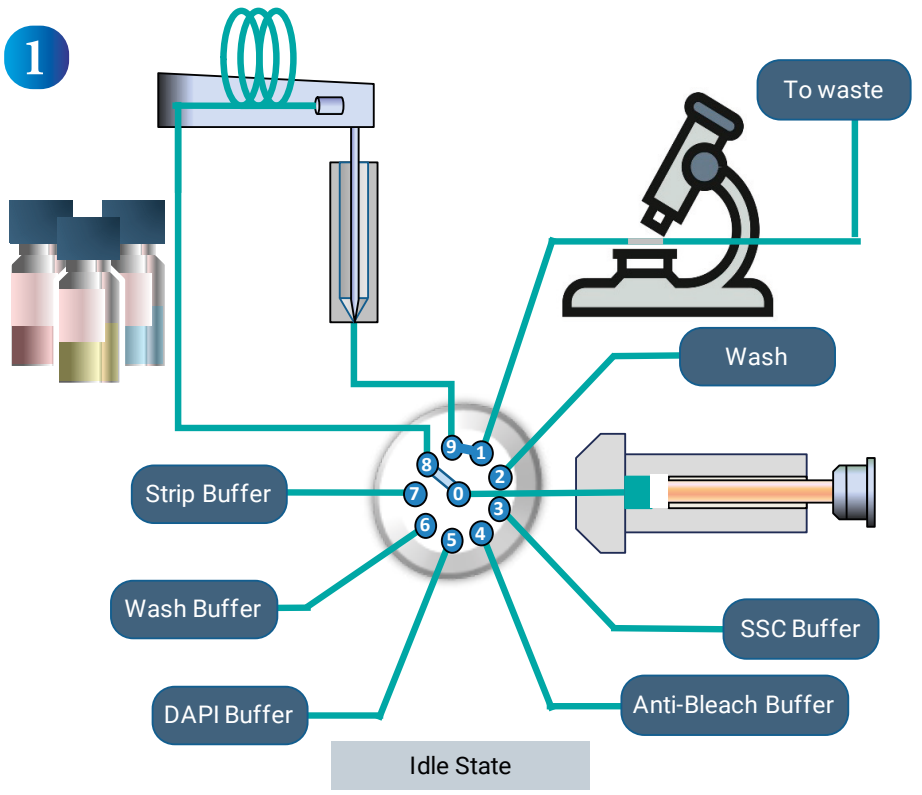
Configuration

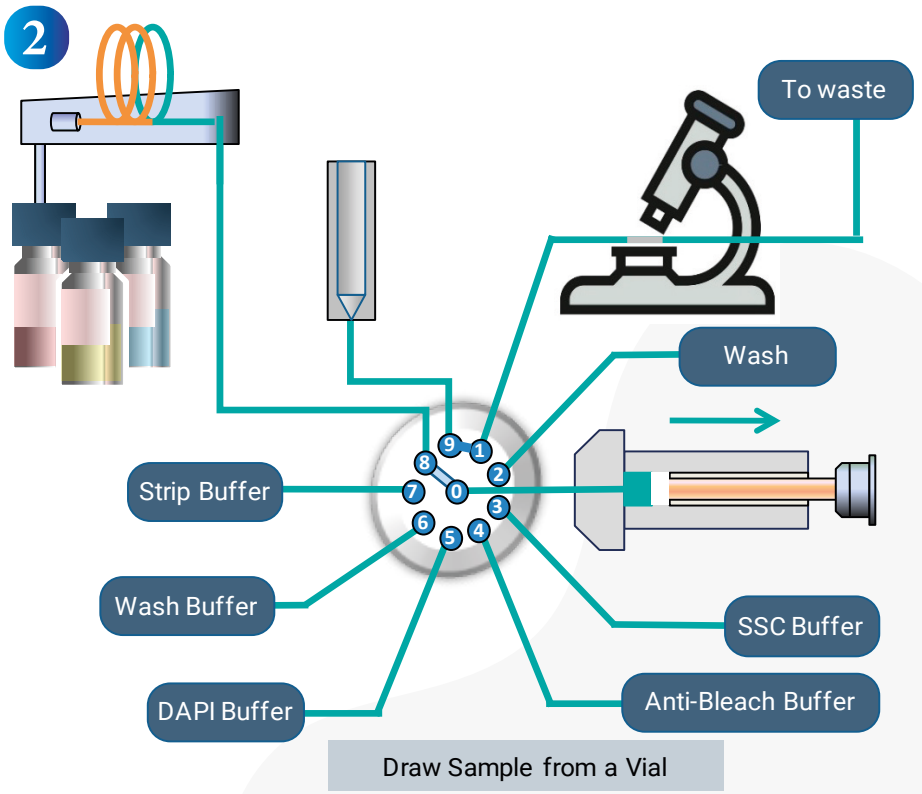
Schematic

Valve: 10x9
Syringe: 4000 µL

This application allows users to automate RNA fluorescent marker delivery to a Sequential Fluorescence in situ Hybridization (seqFISH+) system, with access to multiple buffers to maintain accurate fluorescence and proper piping conditions. An accurate, user-controlled sample volume can be delivered to a line connected to a microscope for seqFISH+ analysis. Additional functions include fluorescent marker mixing, needle cleaning (with up to four solutions), and sample shaking. Fluorescent marker storage capacity includes 48 vials (2 mL volume each) or a 96-well plate. The stator for this application also includes a groove connecting Ports 1 and 9.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 8.
2. The needle leaves the injection port and descends into the chosen vial. Once the needle is in place, the syringe draws in the desired marker volume, temporarily holding it in the loop behind the needle.





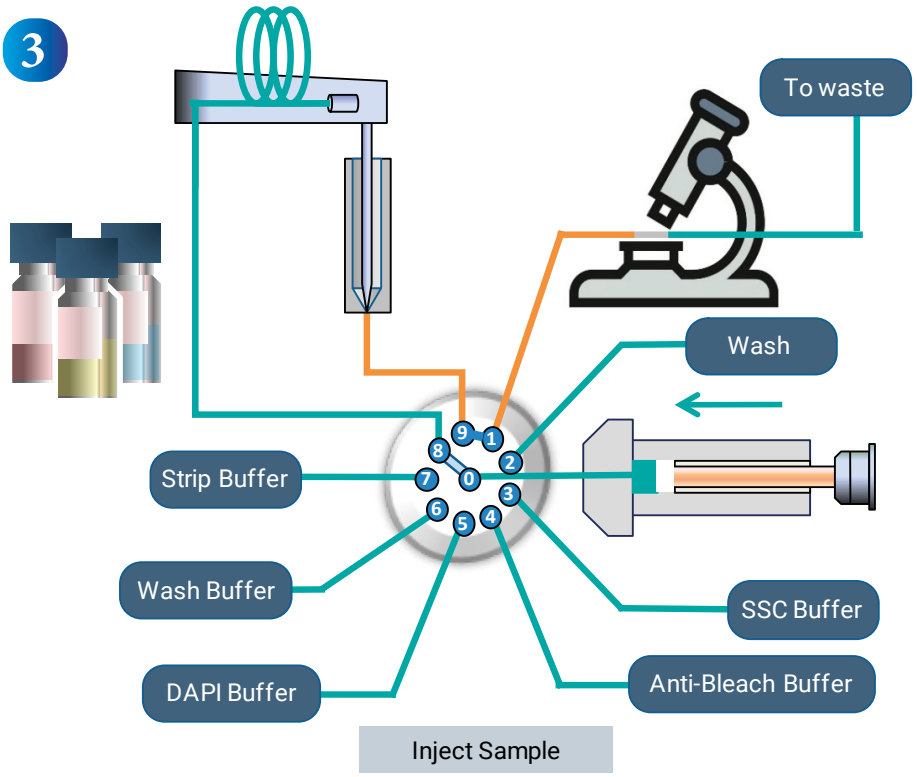
Sequential Fluorescence in situ Hybridization (seqFISH+)

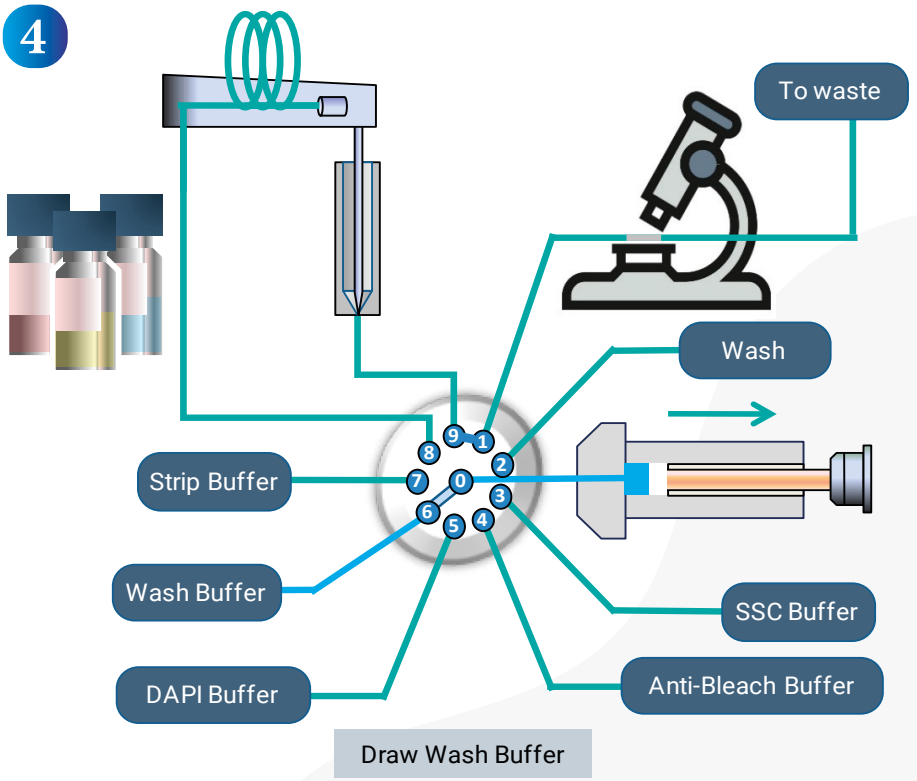
Configuration

Schematic

Valve: 10x9
Syringe: 4000 µL

3. The needle returns to the injection port. Once the needle settles, the pump pushes the marker through the port and into the flow path towards the microscope.
4. The valve then switches to Position 6. Once the valve is set, the syringe draws in the desired volume of wash buffer, temporarily holding it in the syringe





Sequential Fluorescence in situ Hybridization (seqFISH+)

Configuration

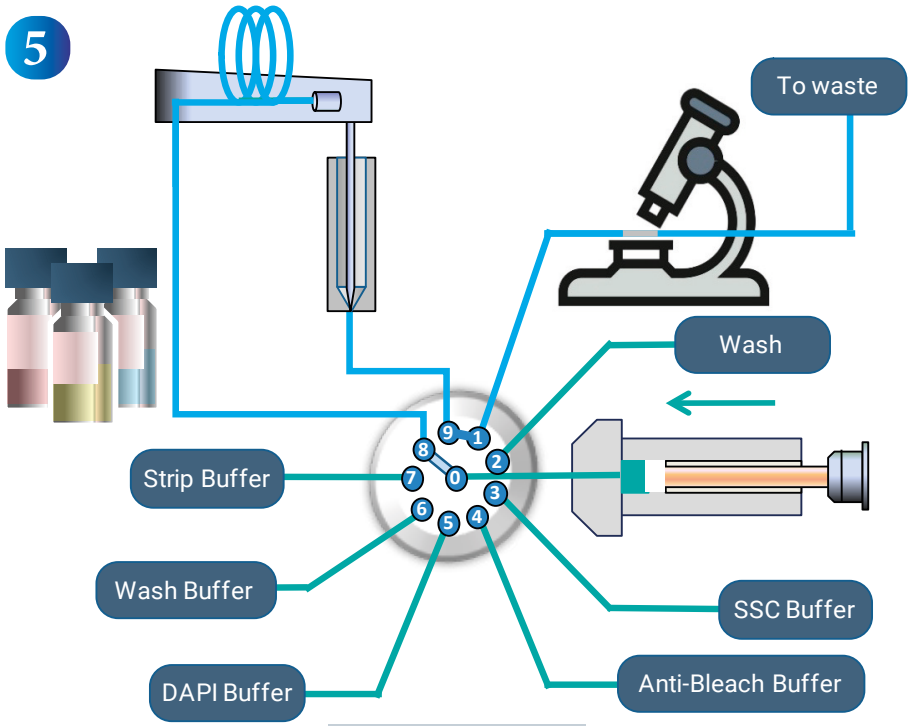
Schematic

Valve: 10x9
Syringe: 4000 µL

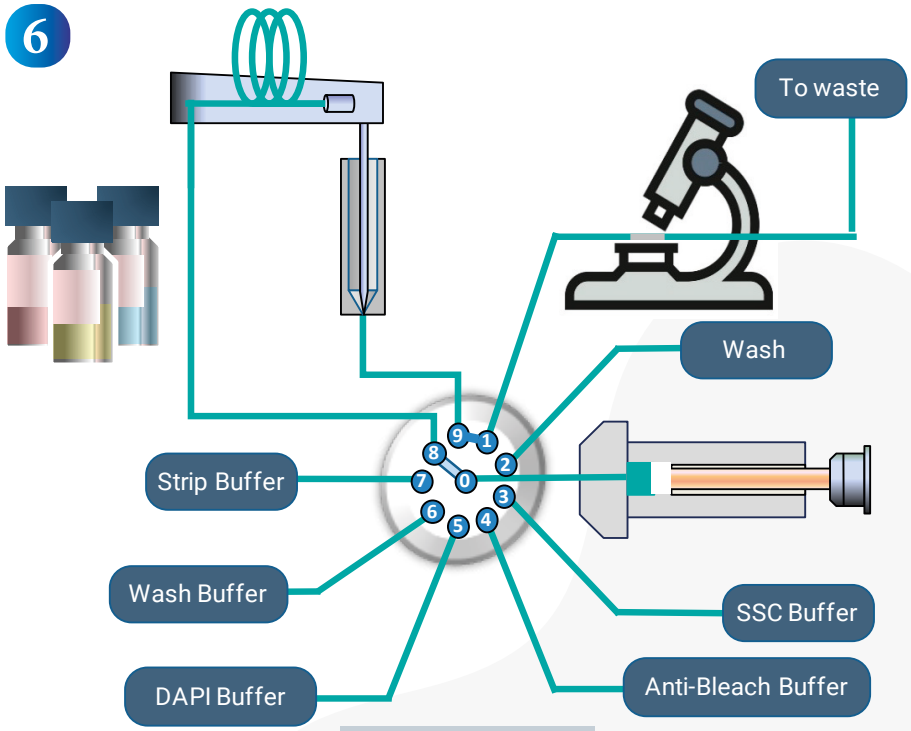
5. The valve switches back to Position 8, and the pump pushes the solvent out of the syringe to purge and clean the line, removing any trace impurities from the previous injection.
6. The valve remains in Position 8, returning the system to the idle, standby state.

To incorporate other buffers as necessary, Steps 4 and 5 can be repeated and modified to wash the line with each respective buffer solution.

5



6



Sample Collection From a Stream

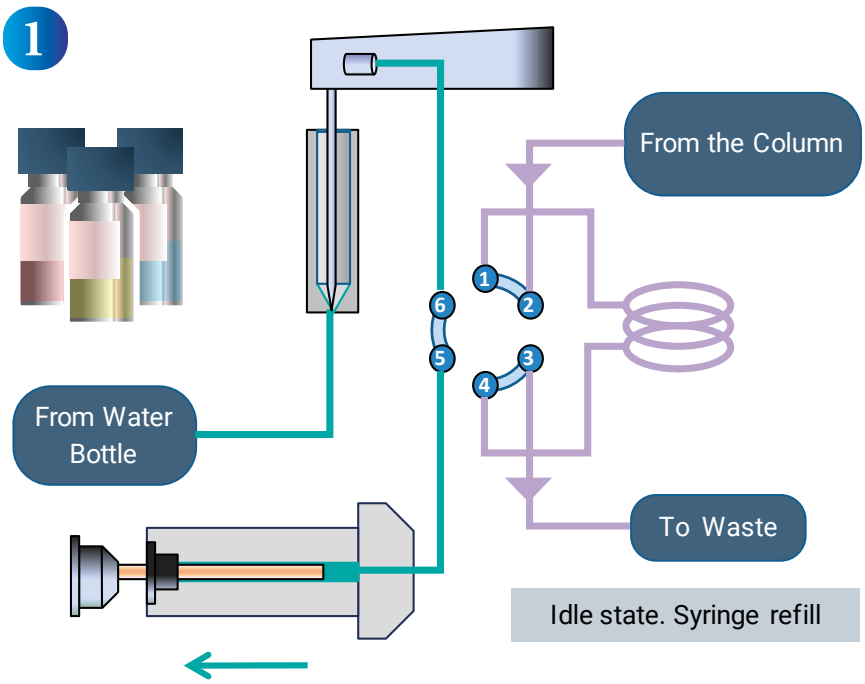
Configuration

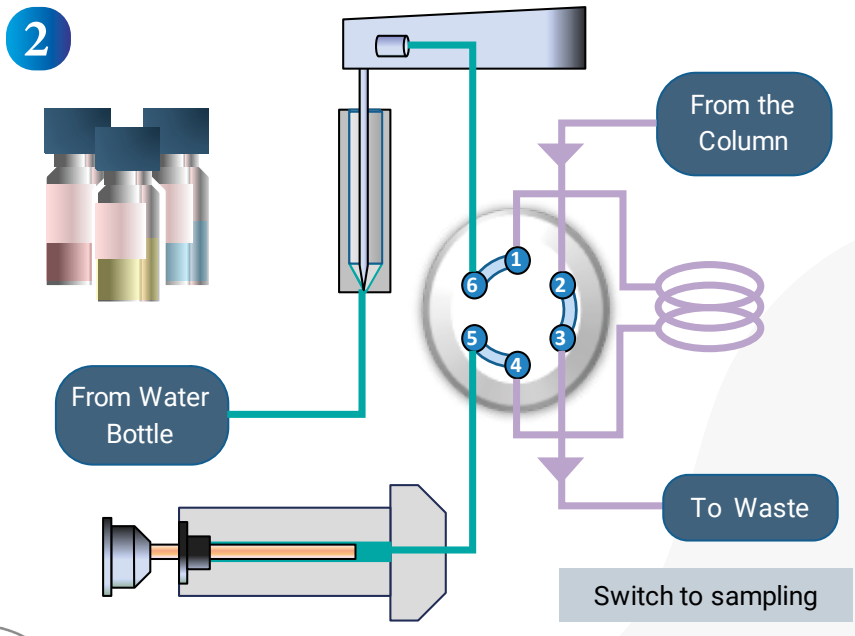
Schematic

Valve: 6x2
Syringe: 4000 µL

This application allows users to automate sampling of liquid eluting from a column or any other stream with small to medium flow rates — up to 1000 mL/min. An accurate sample volume is achieved by using a fixed-volume loop, which can be selected depending on the required sample volume.

1. This application begins with the system in its idle state, with the needle in the injection port, the syringe in the 0 position, and the valve in Position 1–2. The syringe then refills with the desired amount of solvent (typically water).
2. When sampling is initiated, the valve switches to the alternate Position 1–6, and the stream bypasses the loop.





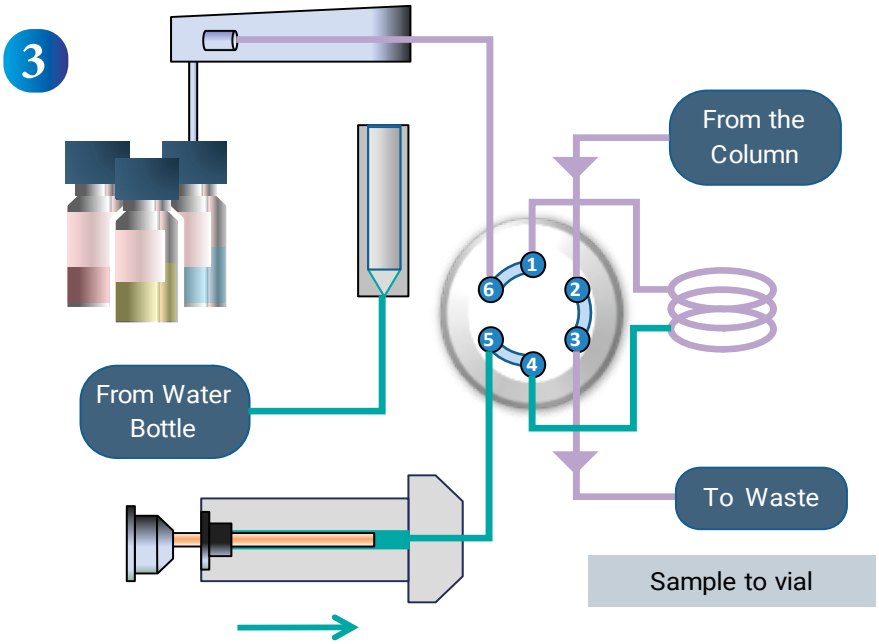
Sample Collection From a Stream

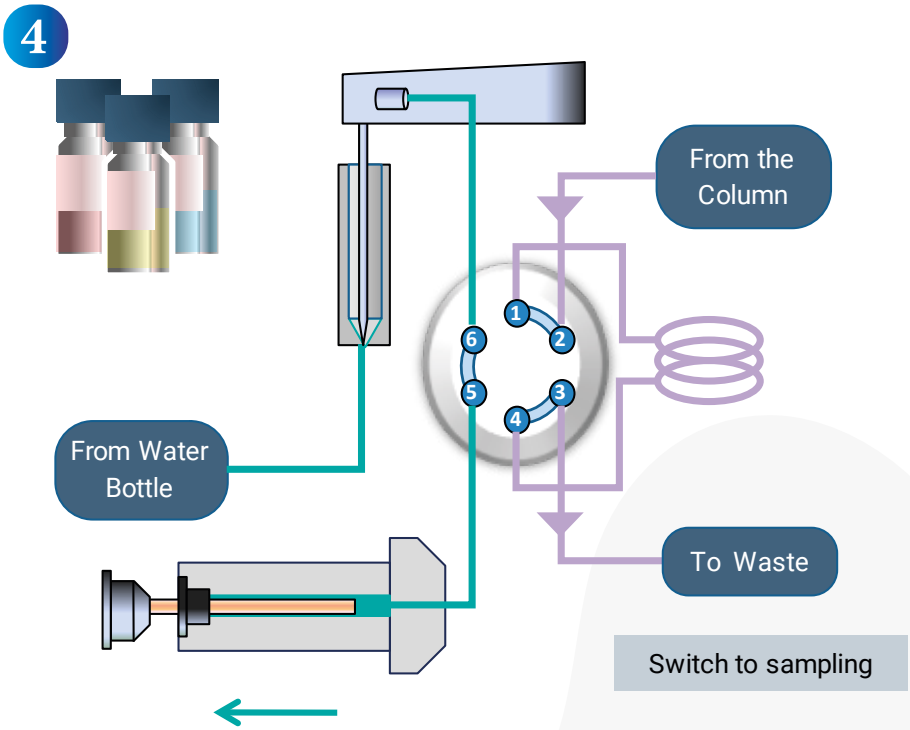
Configuration

Schematic

Valve: 6x2
Syringe: 4000 µL

3. The needle moves to the designated vial, and the syringe pushes the sample into the vial along with the preset amount of solvent. The solvent volume should be sufficient to clean the needle, loop, and connecting line — typically at least five times the sample volume.
4. Once transfer is completed, the valve switches back to the initial Position 1–2, the needle returns to the injection port, and the syringe refills.





Flow Through Reactor Sampling with Alltesta™ and HPLC

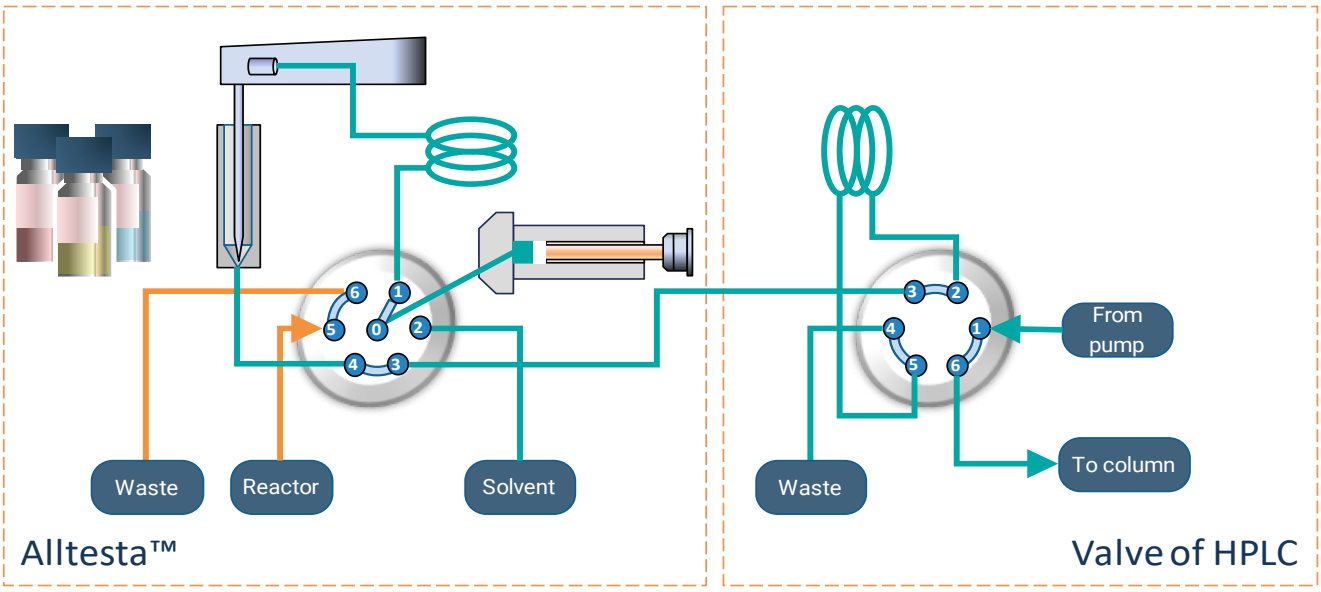
Configuration

Valve: 7x6

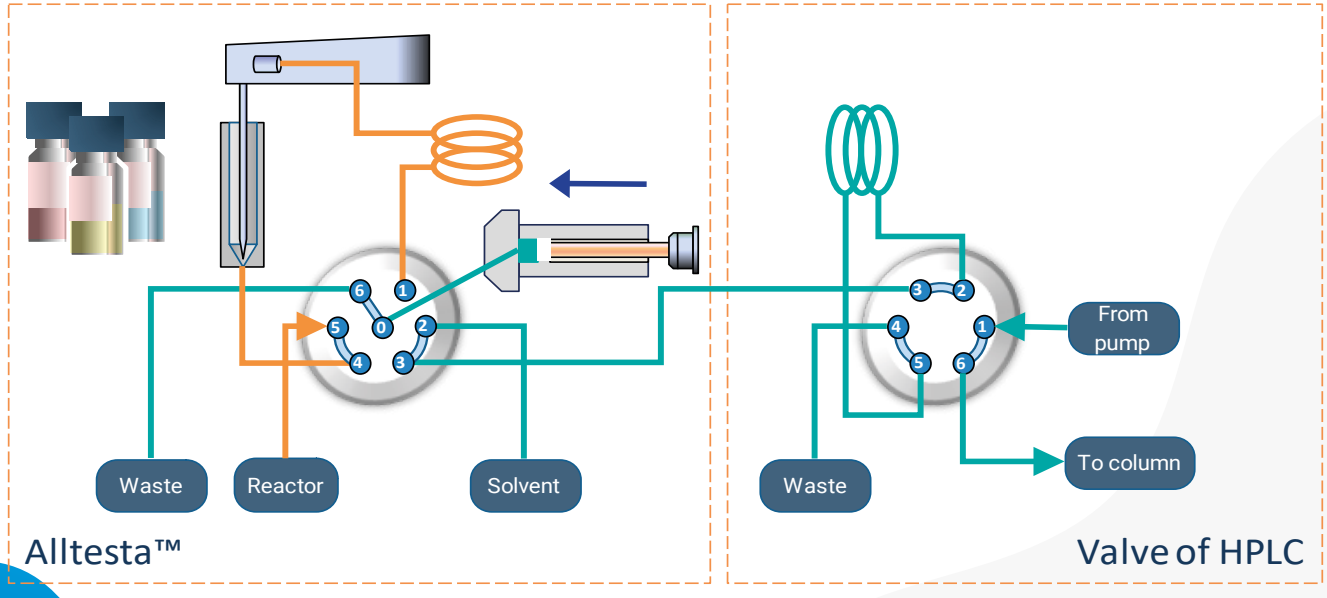
Syringe: 4000 µL

Schematic

1 HPLC – Alltesta™ tandem configuration. Initial state.



2 Dump syringe content. Fill up the loop.



Flow Through Reactor Sampling with Alltesta™ and HPLC

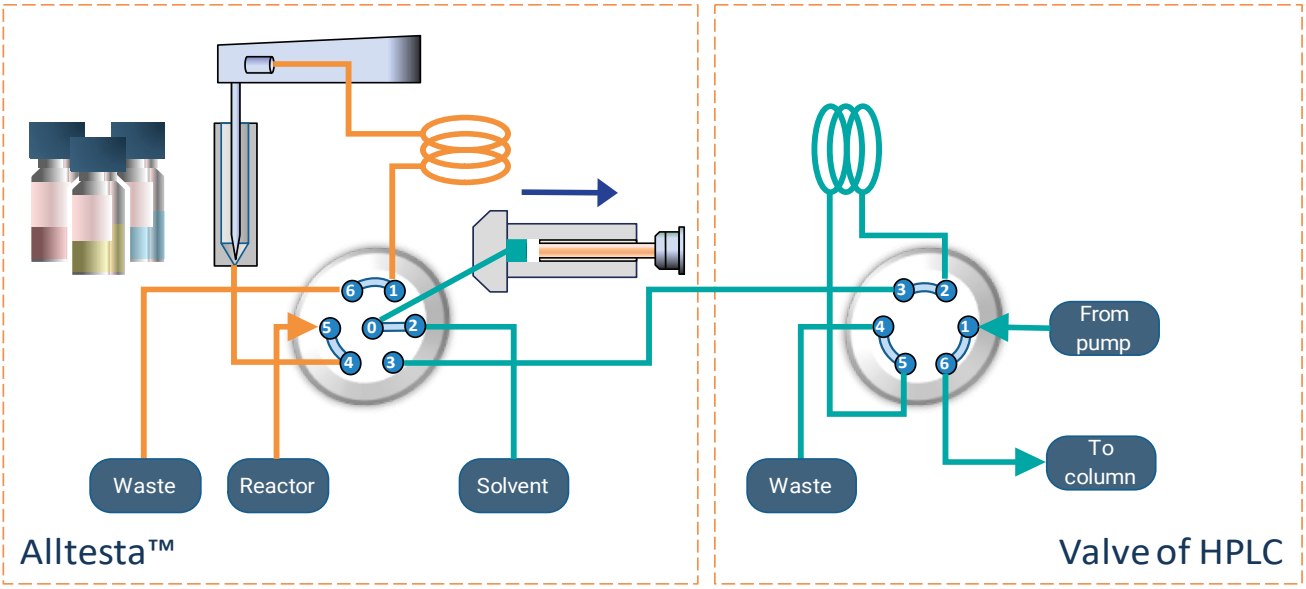
Configuration

Valve: 7x6

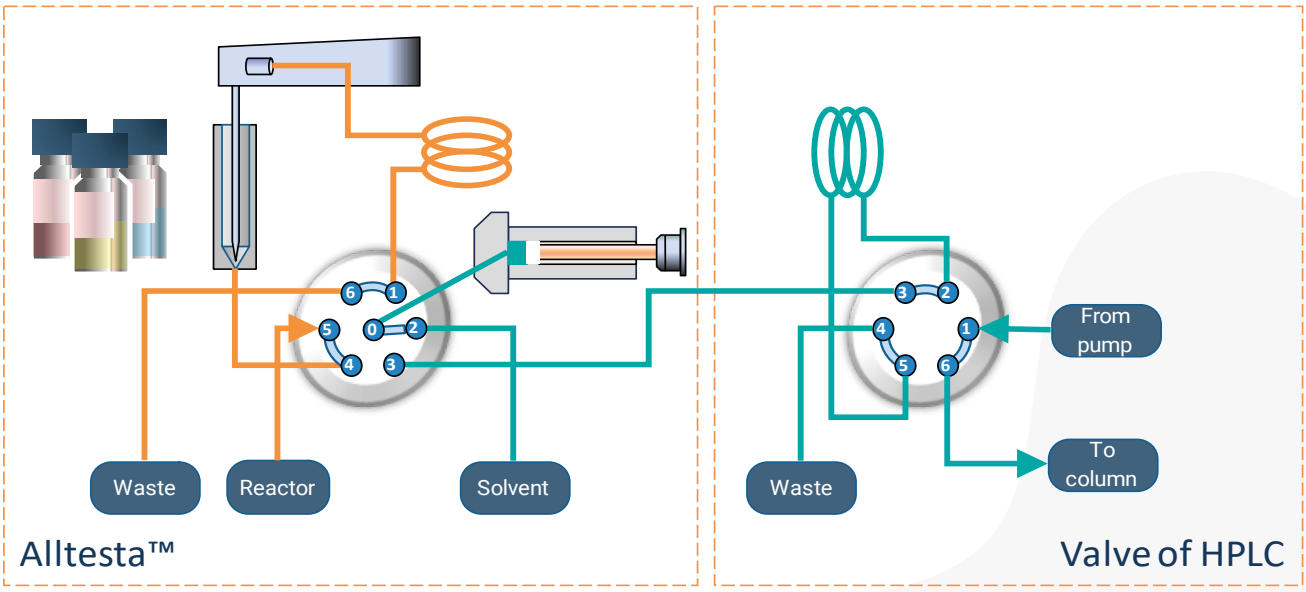
Syringe: 4000 µL

Schematic

3 Syringe refill.



4 Sample from reactor.



Flow Through Reactor Sampling with Alltesta™ and HPLC

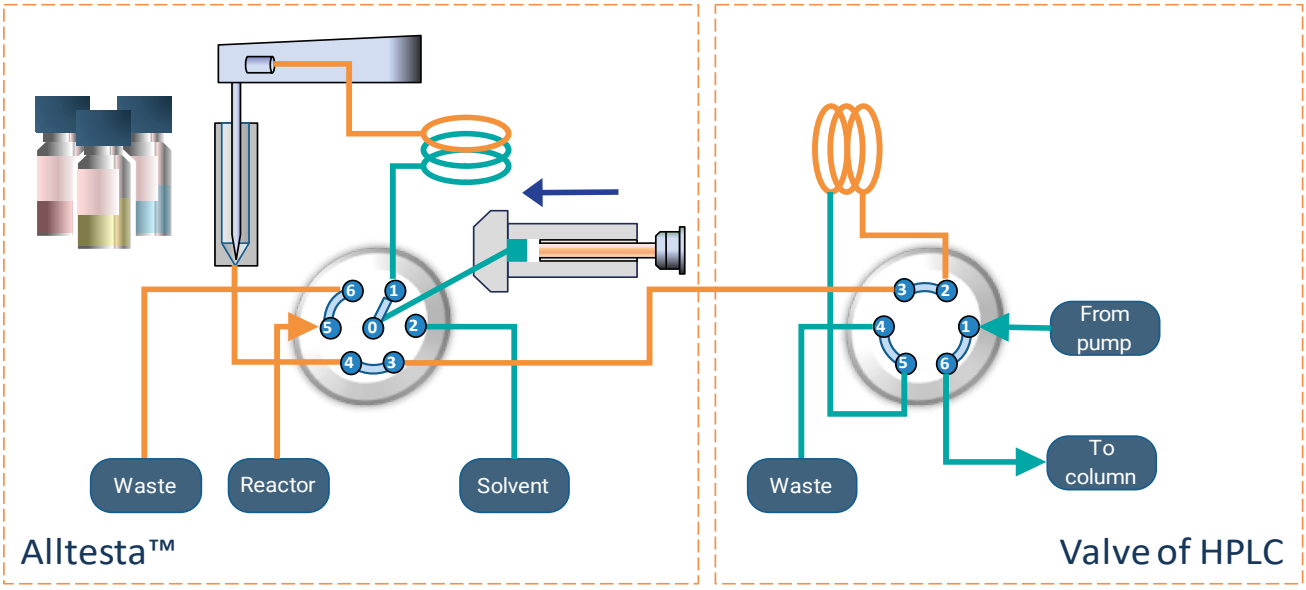
Configuration

Valve: 7x6

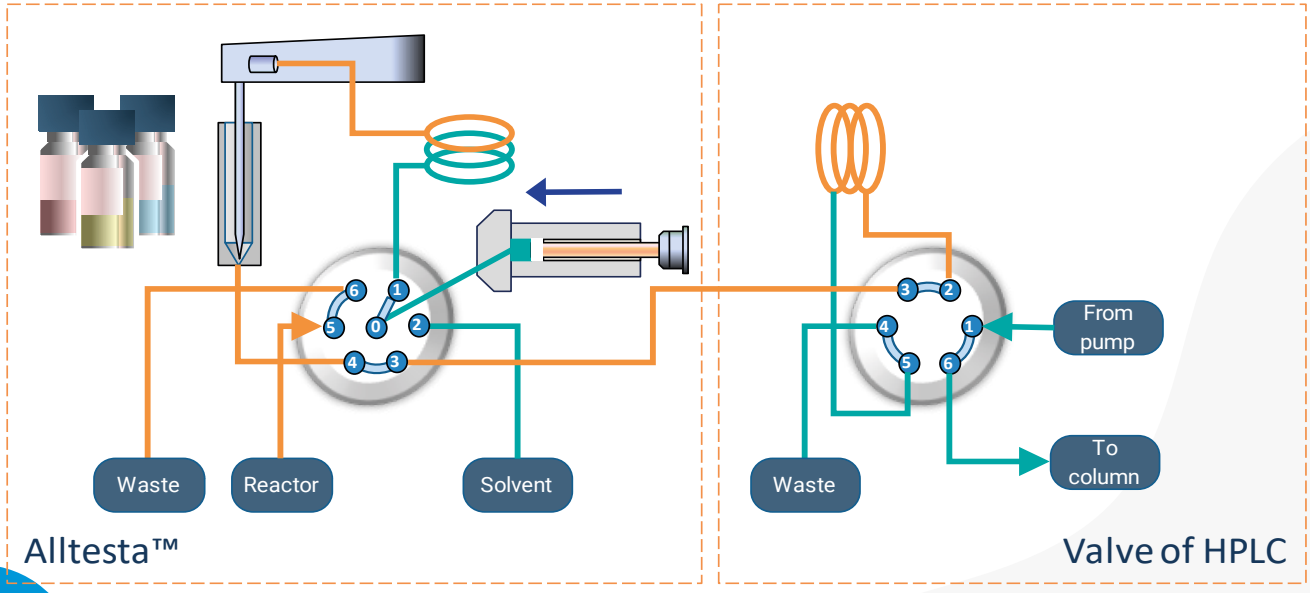
Syringe: 4000 µL

Schematic

5 HPLC loading started.



6 HPLC injection and run. Cleaning connection lines.



Flow Through Reactor Sampling with Alltesta and HPLC

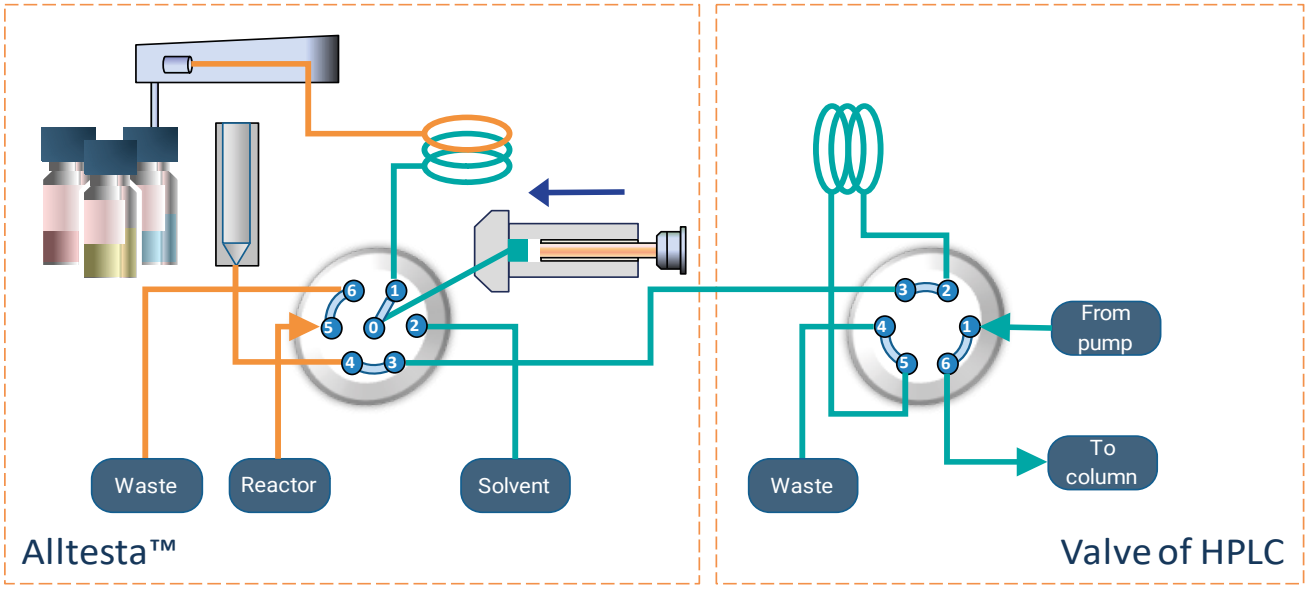
Configuration

Valve: 7x6

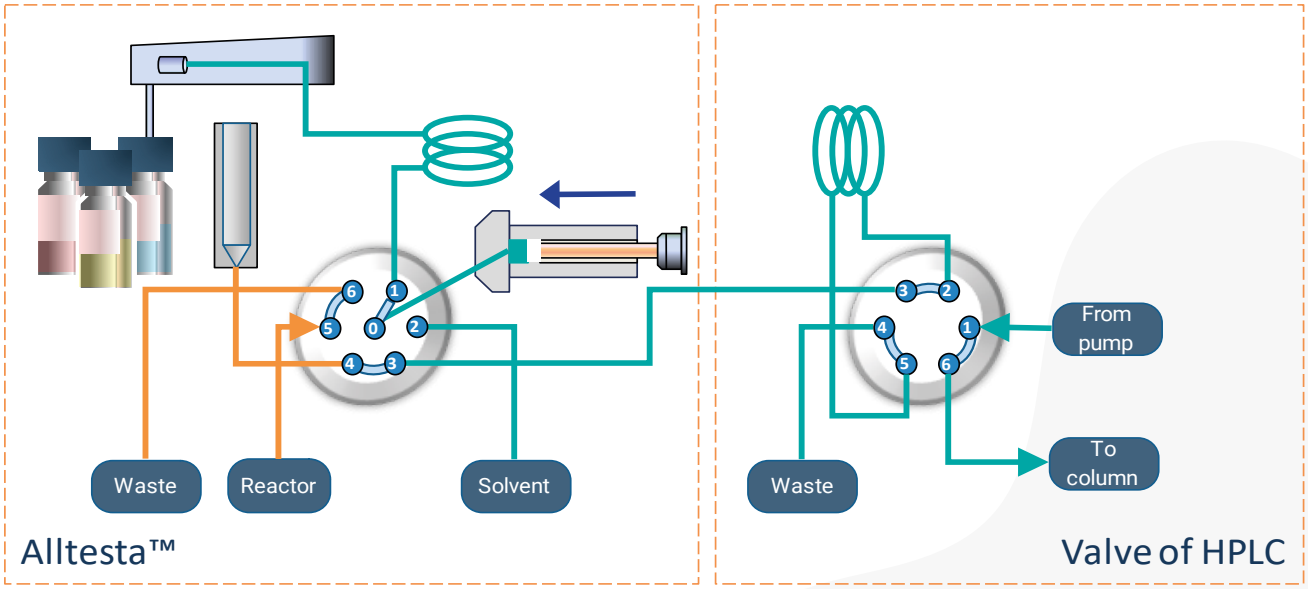
Syringe: 4000 µL

Schematic

7 After run HPLC injector to initial state. Alltesta collects sample in the vial.



8 Excess of sample to a vial. Extra solvent for controlled dilution.



HPLC – Alltesta Tandem Configuration

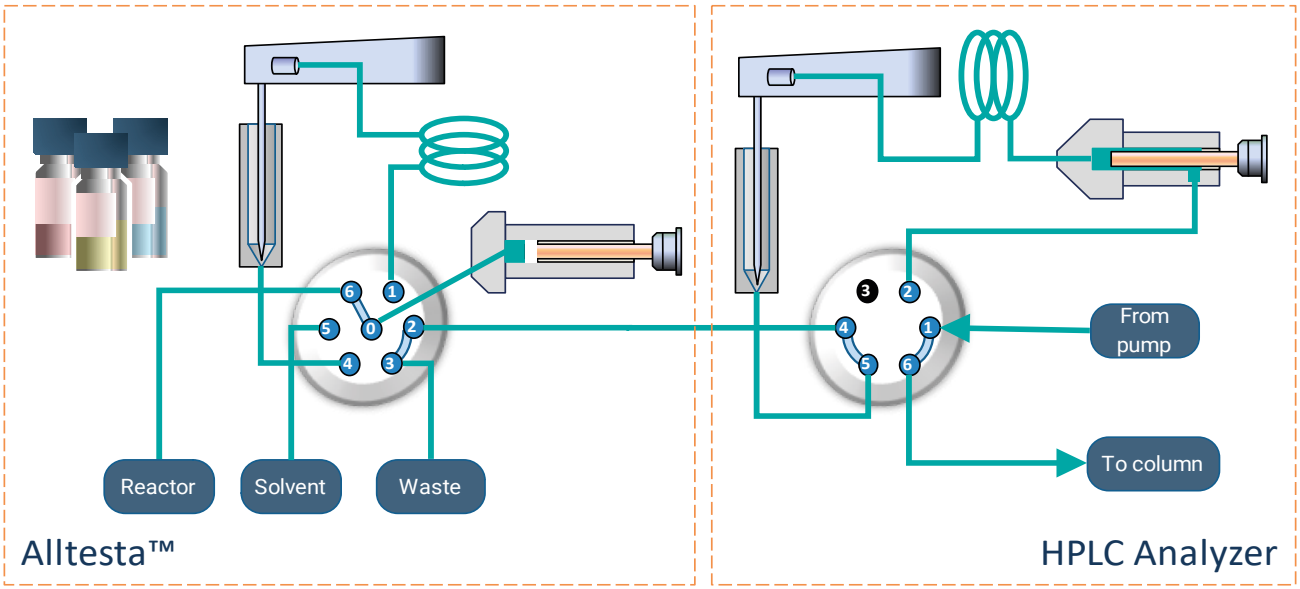
Configuration

Valve: 7x6

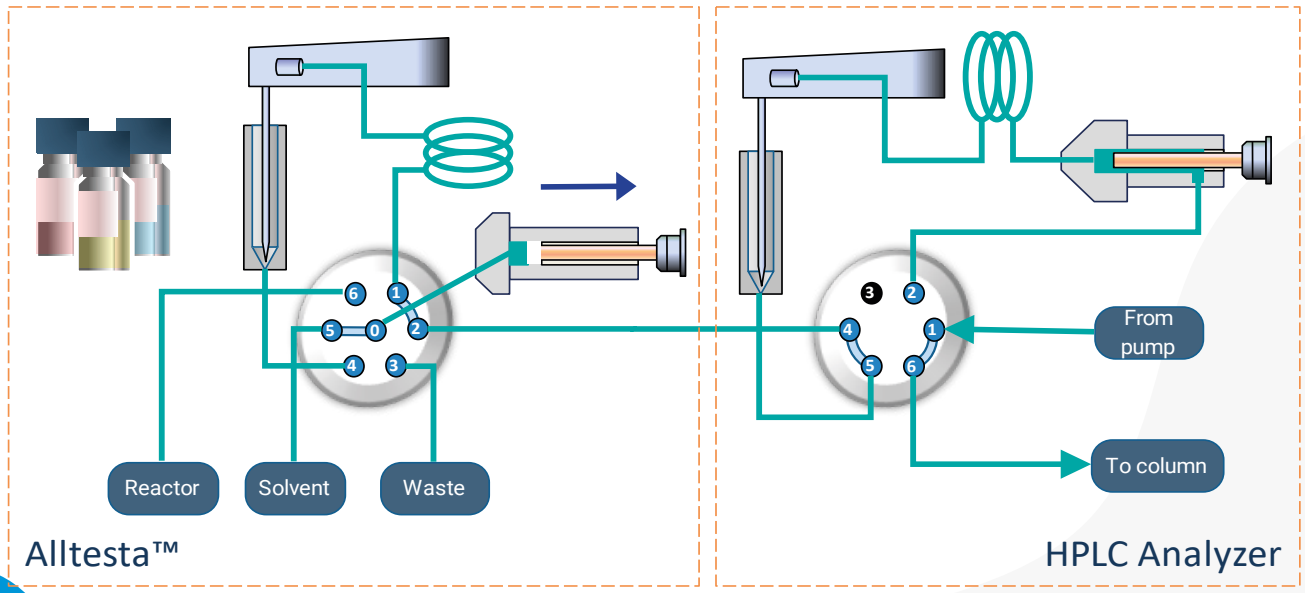
Syringe: 4000 µL

Schematic

1 Agilent – Alltesta tandem configuration.



2 Syringe refill.



HPLC – Alltesta Tandem Configuration

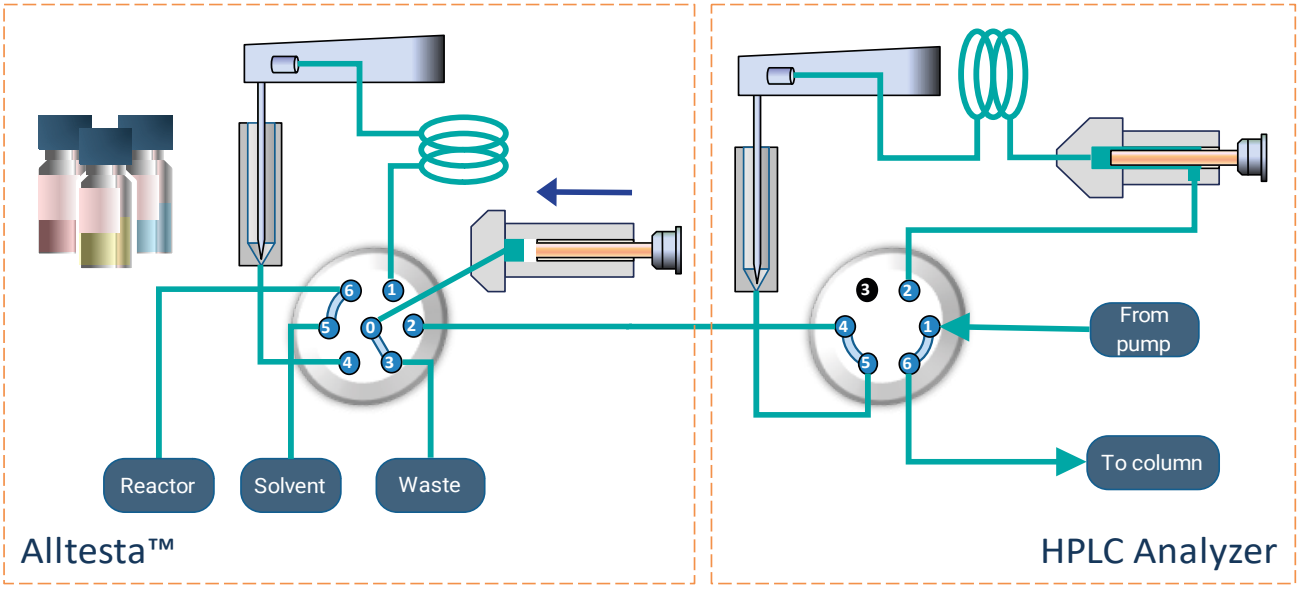
Configuration

Valve: 7x6

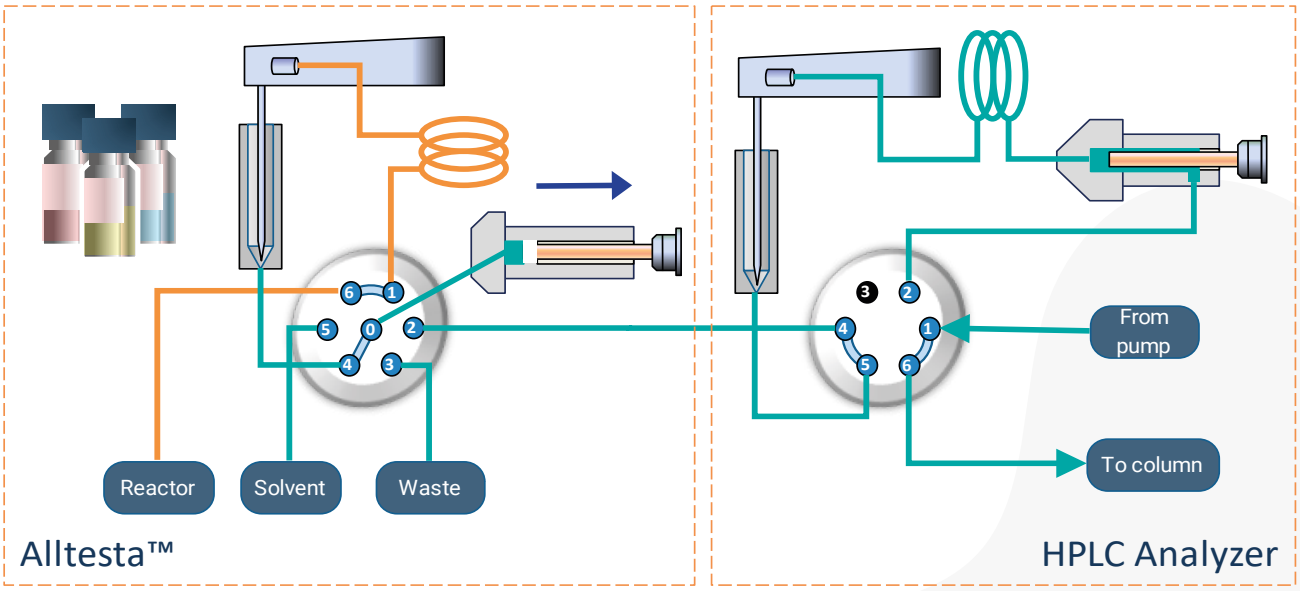
Syringe: 4000 µL

Schematic

3 Dump syringe content.



4 Sample from reactor.



HPLC – Alltesta Tandem Configuration

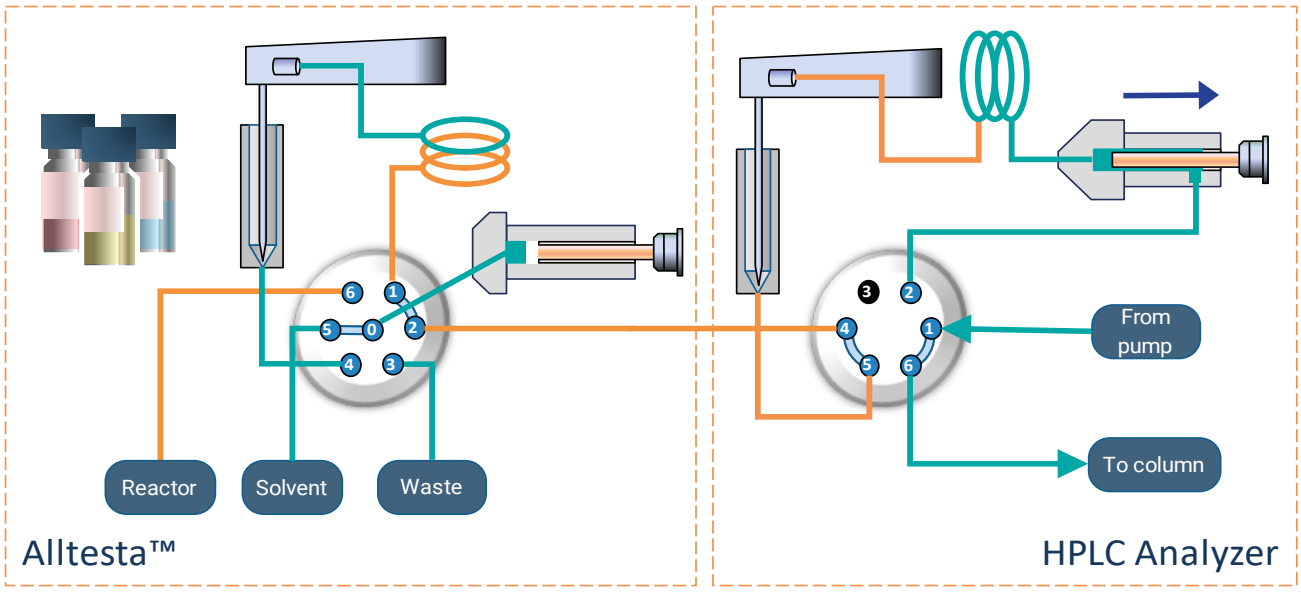
Configuration

Valve: 7x6

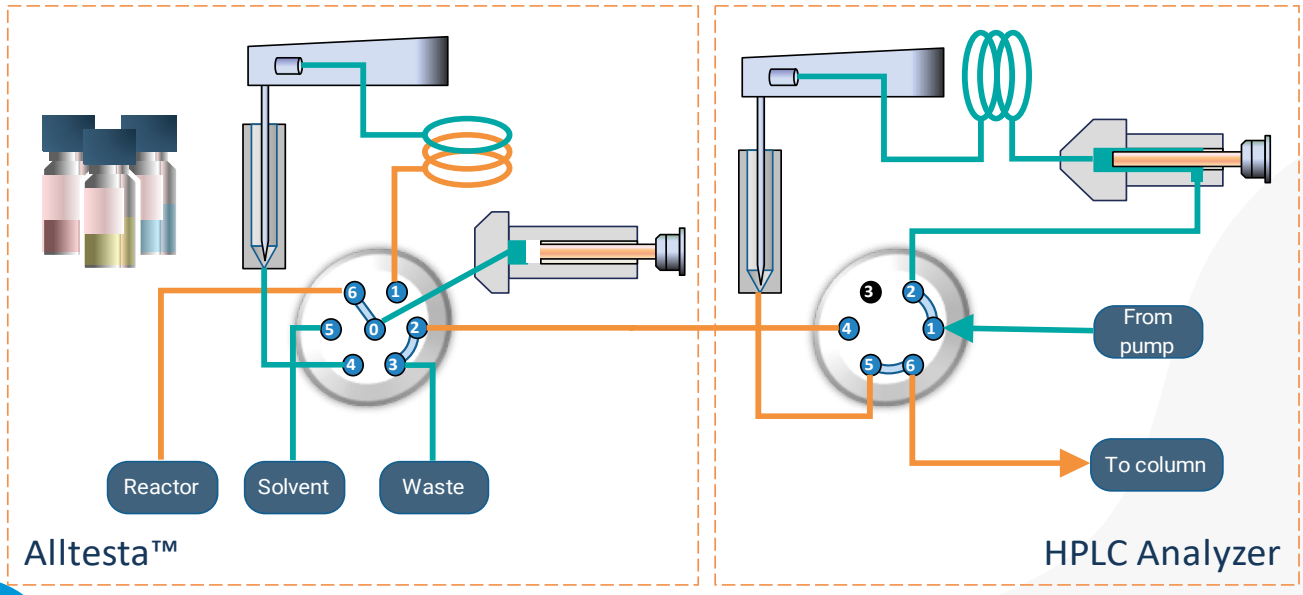
Syringe: 4000 µL

Schematic

5 Agilent injection started.



6 Injection and run.



HPLC – Alltesta Tandem Configuration

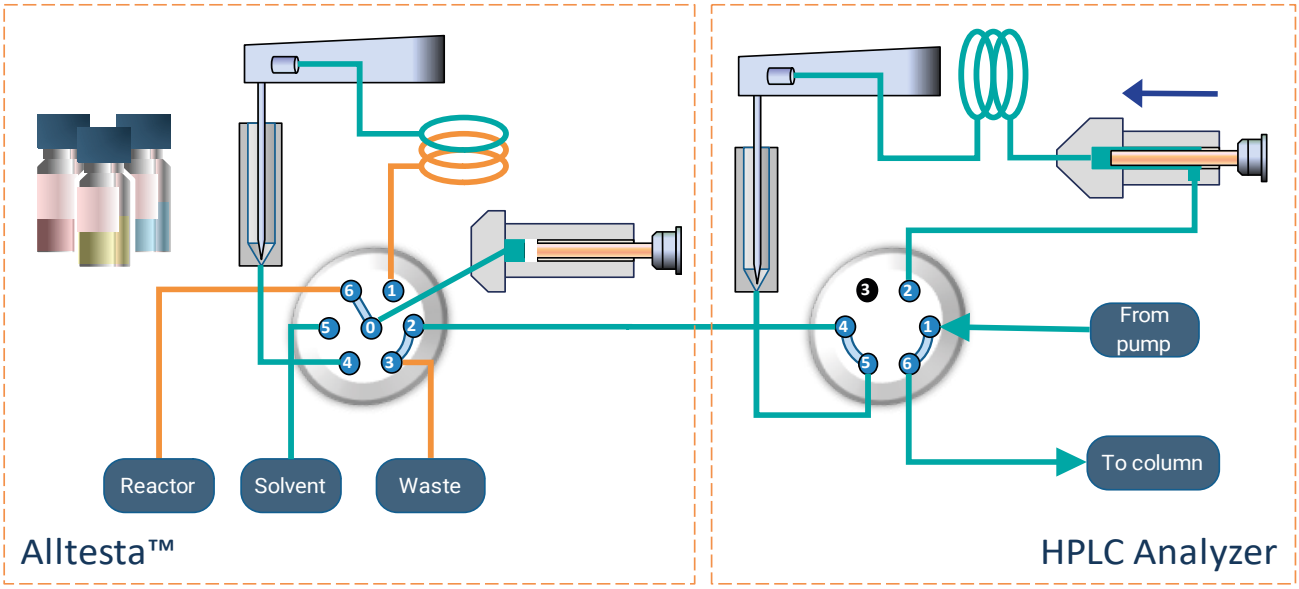
Configuration

Valve: 7x6

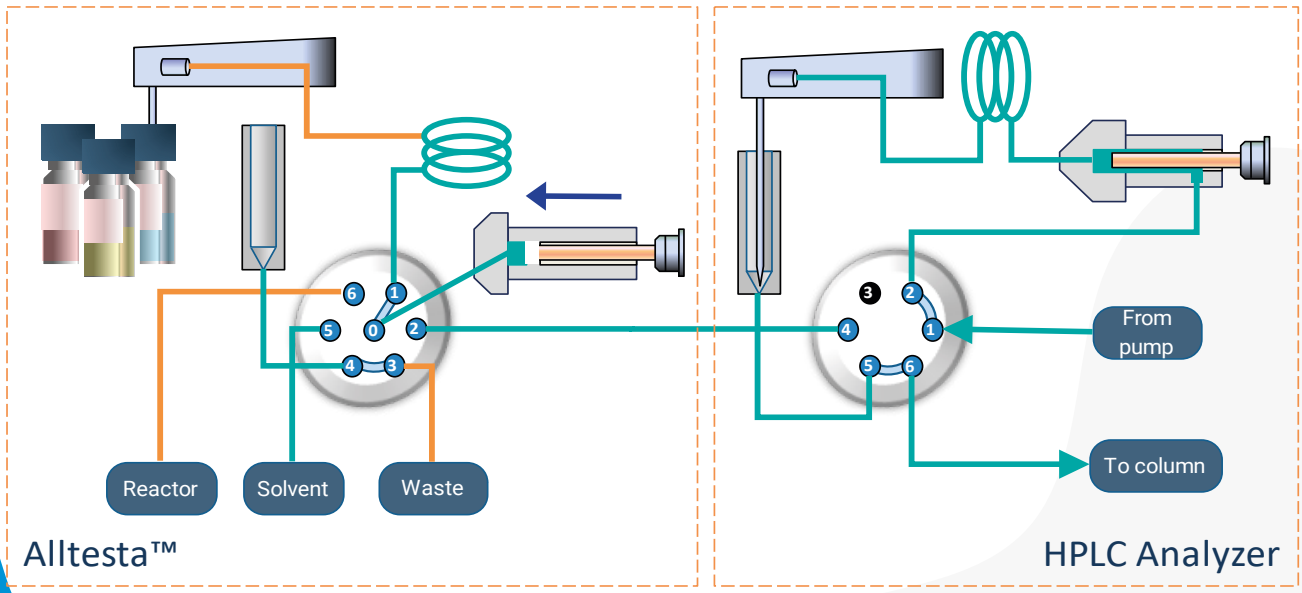
Syringe: 4000 µL

Schematic

7 After run Agilent injector to initial state.



8 Excess of sample to vial.



HPLC – Alltesta Tandem Configuration

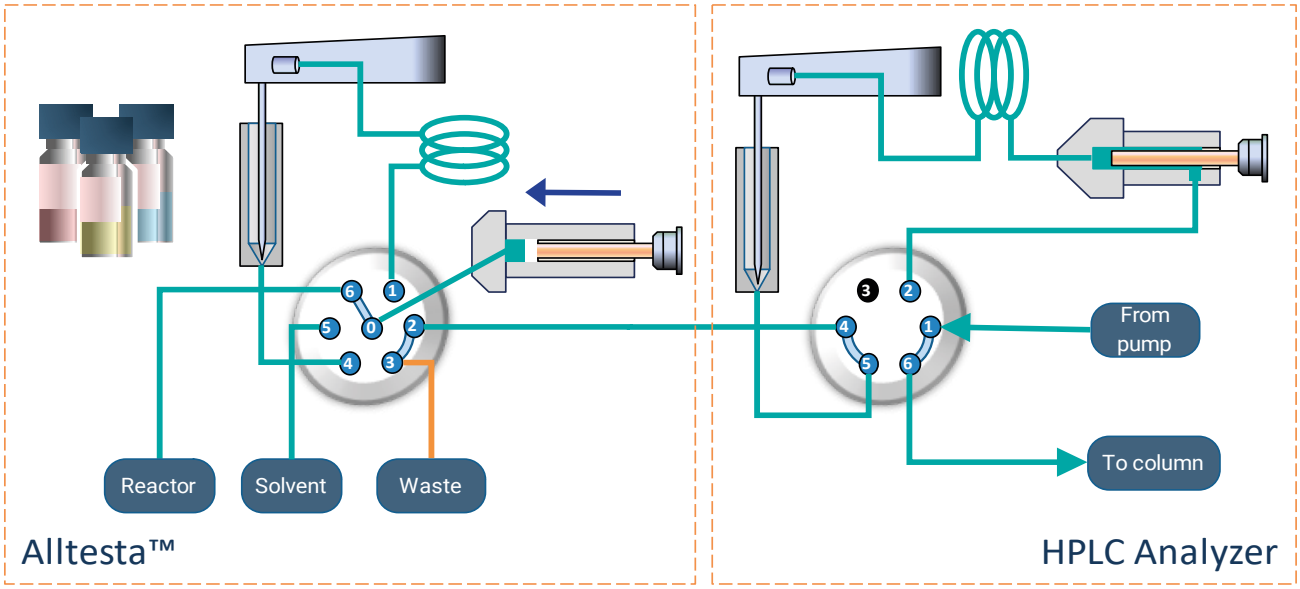
Configuration

Valve: 7x6

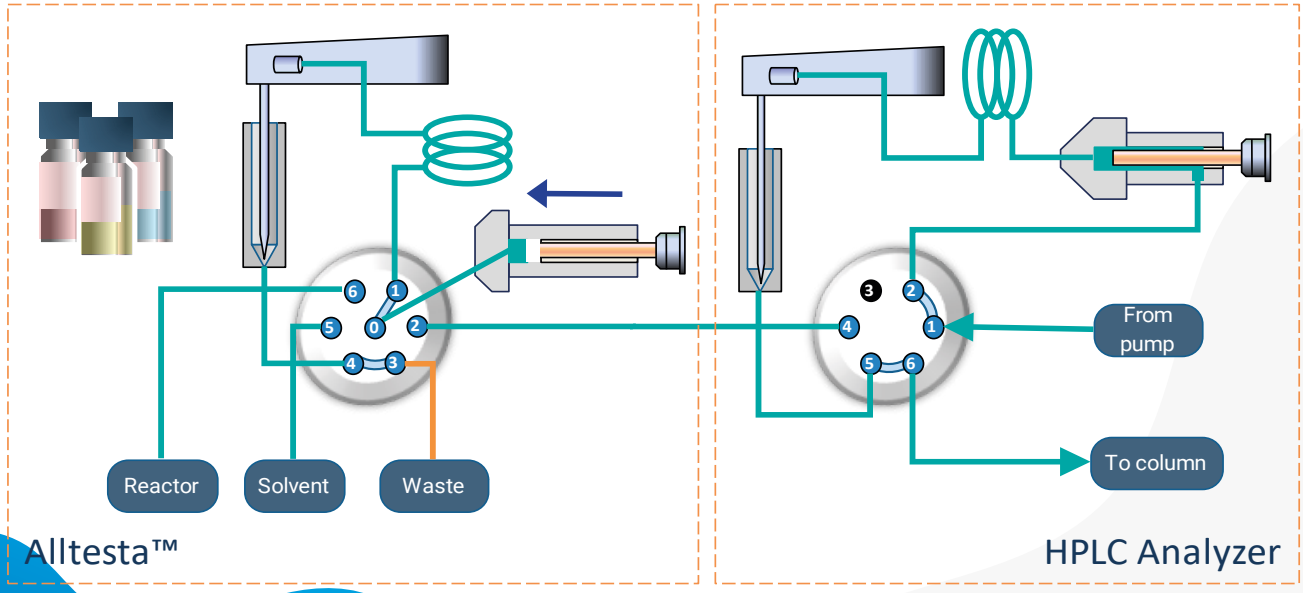
Syringe: 4000 µL

Schematic

9 Cleaning reactor lines.



10 Cleaning loop and getting ready for the next sample.



Technical Specifications

	Alltesta™ Mini-Autosampler Standard configuration	Alltesta™ Mini-Autosampler Customizable configuration
Dimensions (WHL)	160 x 145 x 195 mm / 6.3 x 5.71 x 7.68 in	depends on configuration
Weight	3 kg / 6.6 lb	depends on configuration
Power	24 V	24 V
Plate	48 vials	• 48 vials • 96-well plate • 384-well plate
Pressure	Up to 5000 psi (345 bar)	depends on configuration
Syringe Capacity	4000 µL low-pressure stainless	• 120 µL high-pressure • 4000 µL low-pressure stainless • 4000 µL low-pressure ceramic
Valve options	6x2	• 6×2 • 7×6 • 10×9 • 7×6* • 6×2*
Needle	Short (36 mm)	• Short (36 mm) • Long (46 mm) • Capillary metal ceramic • Short (36mm) Vented
Miscellaneous	Wash Station	• None • Wash Station
Volume Accuracy	0.1 µL	depends on configuration
Materials	in contact with liquid SS316, PTFE, PEEK	in contact with liquid SS316, PTFE, PEEK
Communication	RS232 Virtual COM port via USB	RS232 Virtual COM port via USB

*other rotor

Call to Action

Unlock the potential of Alltesta™ for you today:

- Contact us to place an order or ask questions.
- Request a free method development consultation.
- Schedule a demonstration to see our analyzers in action.
- Visit our website or scan the QR code below for more details.

Conclusion

With its customizable features, robust design, and versatile capabilities, the **Alltesta™ Mini-Autosampler** delivers exceptional value and performance for reliable automation solutions.

Learn more on our website or contact us for consultations and demonstrations.

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