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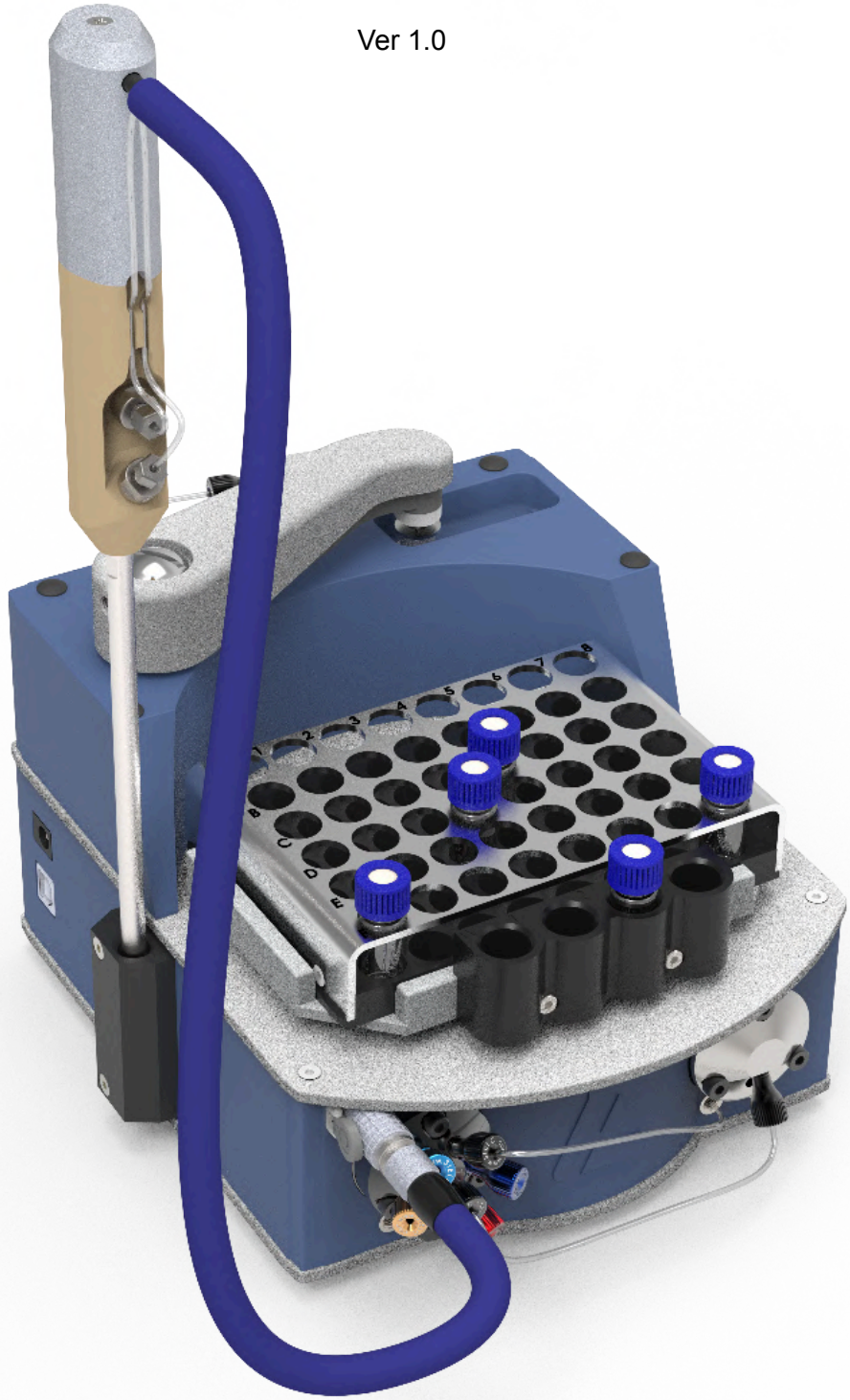
Samplify™ Automated Sampling System Manual

Ver 1.0



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Intended Use

The **Samplify™ Automated Sampling System** is designed for automated liquid sampling from both closed and open systems, including reactor setups operating under high pressure, high temperature, or other extreme and hazardous conditions — all without the need for operator intervention.

Samplify™ automatically collects samples at predefined time intervals, increasing **accuracy**, **safety**, and **efficiency**. The system minimizes cross-contamination, protects samples from exposure to oxygen or moisture in anaerobic environments, and significantly improves data **reproducibility**.

Special Features:

- **Standard Vial Compatibility**: Works with universal collection vials, fully compatible with both **HPLC** and **GC** systems.
- **Adjustable Sample Volume**: The sample volume can be selected in the wide diapason.
- **Customizable Solvent Dilution**: The desired solvent dilution ratio is selected by the user.
- **Automated Mixing**: Automated vial shaking for fast mixing of samples with reagents.
- **Compact Probe Design**: Probe can be placed in a temperature controlled chamber
- **Sample Capacity**: Can accommodate 48 or 96 samples for a single sampling session.
- **Minimal Dispersion**: The compact device size enables close positioning to Reactors, reducing connection line length and preventing sample loss.

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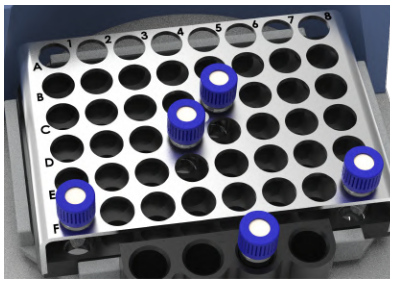
Functional Components

The Samplify™ Automated Sampling is an electromechanical device that consists of several functional components.

1. Carousel (Tray)

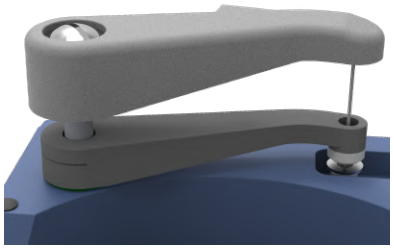
The tray vials hold the samples delivered via needle. Available in configurations: 48-vial tray or 96-well plate with optional 4 port washing station.

More information: Plate Type



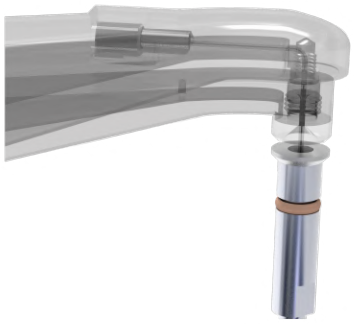
2. Arm with Needle

Arm with Needle – performs sample discharging and transfer. The needle is a hollow sharp tube that penetrates vial septa, discharging the sample with solvent and quench solution. After sample filling, the needle lifts, releases the vial, and moves the home position (waste port).



3. Waste Port

Serves as an outlet for discharging used liquid from system components, usually following cleaning or rinsing operations.



4. Syringe

The metering pump of the syringe type is a cylindrical chamber of 4000 µL volume with a reciprocating plunger actuated by a stepper motor. It provides precise sample and solvent dosing and transfer.

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5. Valve

The valve controls direction of liquid flow. It is electrically actuated and designed to route liquids between multiple channels. The valve has 7 ports: six numbered angled ports and one **central port**, referred to as **position 0** (note: *this port is not labeled on the device*). Due to the presence of two internal grooves in the rotor, the valve simultaneously connects two pairs of ports. The central port (port 0) is connected to the syringe pump.

6. Samplify™ Probe

An electromechanical device for precise, automated liquid sampling from closed or open process systems. Made from reactive chemical-resistant materials, it ensures accurate, contamination-free sampling, even from a high-temperature chemical solution.

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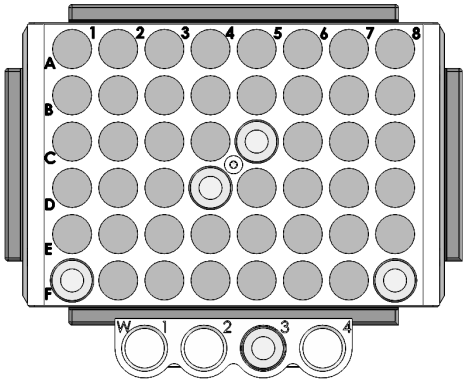
Plate Type

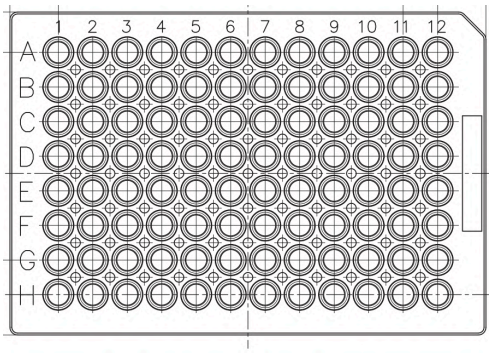
Tray-48 vials

- **Loading/unloading**: The tray allows convenient exchange of either individual vials or an entire well plate.
- **Supported formats**: Standard vial dimensions (e.g., 12×32 mm, 2 mL vials) are supported.
- **Dimensions:** 127 mm × 85 mm × 24 mm (35.5 mm with vials) - (5.00 × 3.35 × 0.94 in; 1.40 in with vials).



Tray-96 wells-plate

- **Loading/unloading:** The tray can be replaced with 96 well plates.
- **Dimensions:** 128 mm × 85 mm × 30 mm (5.04 × 3.35 × 1.18 in).



Software Control. See the procedure in “Samplify™ Windows Application”

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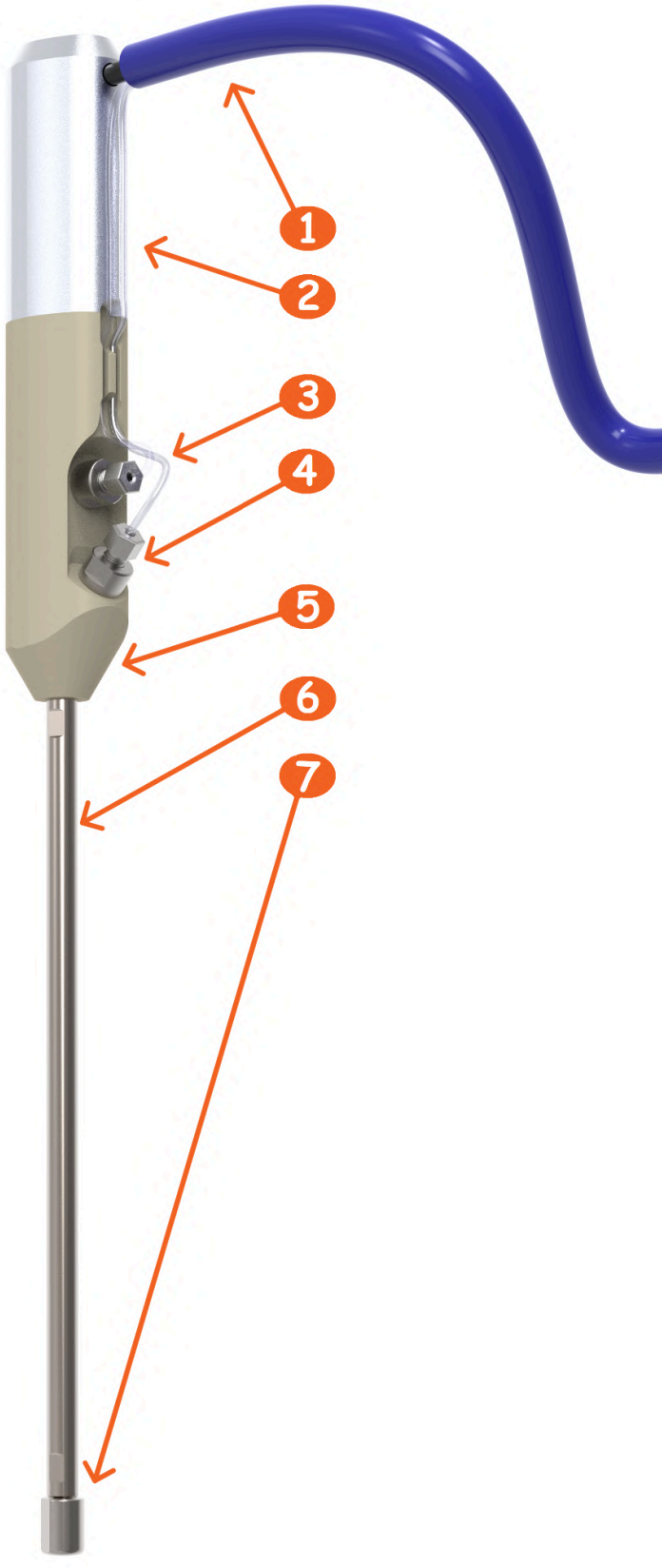
Samplify™ Probe

Overview



1) **Cord**
   The cord includes an electric power cable and two tubes. It connects the Samplify Probe to its station.

2) **Metal Cap**
   Designed for heat dissipation.
   ⚠️ *Caution: May become hot during intensive use.*

3) **Probe Solvent Port**
   Connects solvent supply line with internal components of the probe. Uses 10-32 threaded fittings.

4) **Probe Loop Port**
   Connects sample loop line with internal components of the probe. Uses 10-32 threaded fittings.

5) **Main Body**
   Ergonomically designed from chemically inert material,provides compatibility with most organic solvents and reagents.

6) **Immersion Tube**
   The tube is immersed in the solution to draw liquid samples.

7) **Probe Tip**
   Removable tip with or without filter. The filter prevents particles from entering the probe when sampling a non-homogeneous solution.

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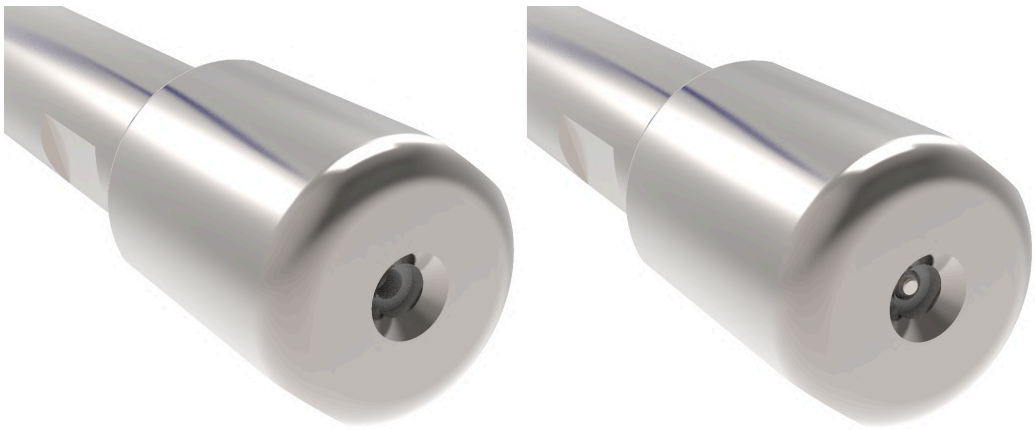
Samplify Probe Operation

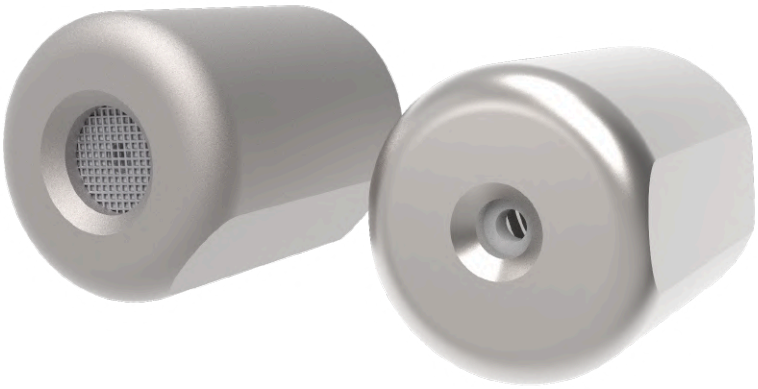
The probe is equipped with an opening at the bottom end. This opening can be opened or closed depending on the operation state.



1. **Open Position (left image) -** When the tip is open, the sample can be aspirated by the probe
2. **Closed Position (right image) -** When the tip is closed, the internal volume of the probe is isolated from the reaction liquid. In this state samples can be transferred to the vial by inert liquid/solvent and the internal channel can be cleaned to minimize cross-contamination between samples.

Replaceable Probe Tips

The probe can be equipped with an open tip or tip with a filter.



1. **Tip with a filter** (left image) protects the instrument's tubing, needle, and vial from particles larger than 0.15 mm. However, the filter introduces flow resistance, which can result in increased sample intake time, intermittent pauses, and may slightly reduce sampling accuracy.
2. **Open tip** (right image) allows for easier liquid flow and is recommended for use with homogeneous reactor solutions.

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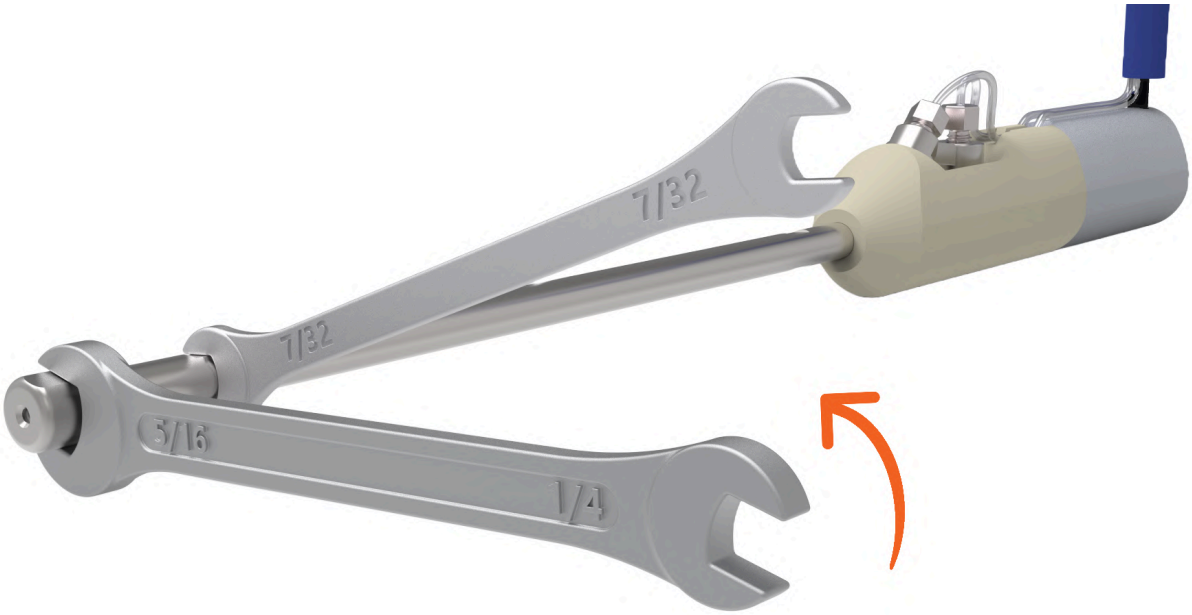
Probe Tip Replacement Procedure for Samplify™ Probe

Disassembly

1) Use a **7/32" wrench** to hold the flats on the tube. While holding the tube steady, use a **5/16" wrench** to unscrew the **Probe tip**, using the 7/32" wrench for support.



2) Once loosened, remove the probe tip completely.

Assembly

Select the desired **Probe tip**. Repeat the disassembly steps in reverse order to assemble the probe.

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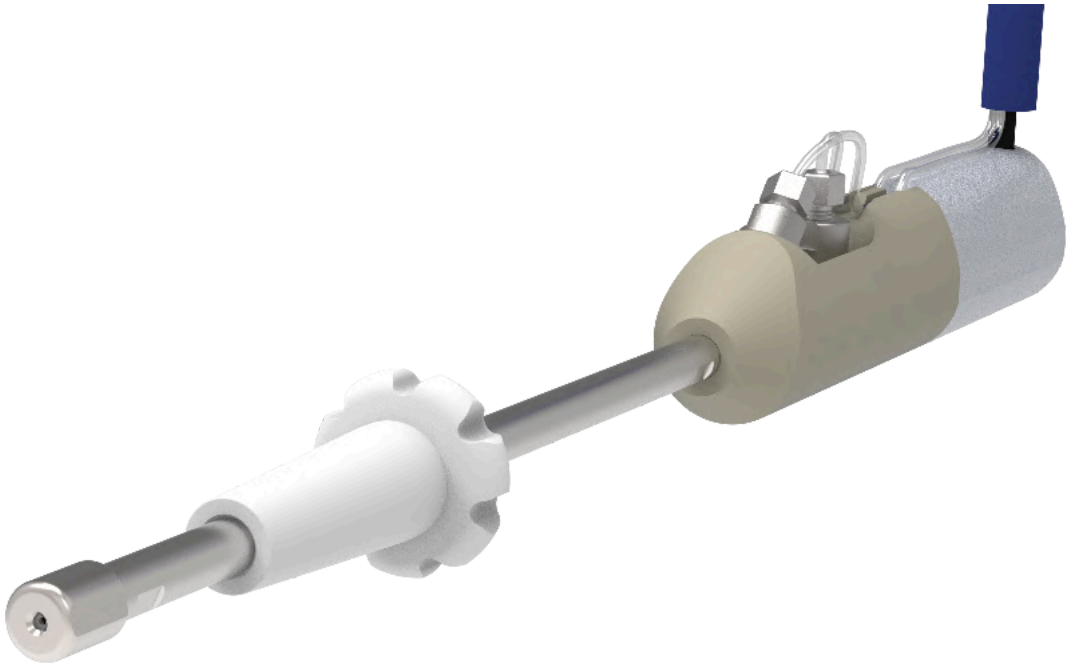
Probe Flask adapter assembly

The **Probe Flask Adapter** is made of **PTFE**. Be careful during installation — improper handling may cause damage.

1) **Remove the Probe tip** as shown on the previous page (Wrenches 5/16 and 7/32 needed).
2) **Slide the Probe Flask Adapter onto the tube** as illustrated. It may be a tight fit, so gently **rotate the adapter** while pushing it on to ease the installation.

3) **Reattach the Probe tip** by screwing it back into place.



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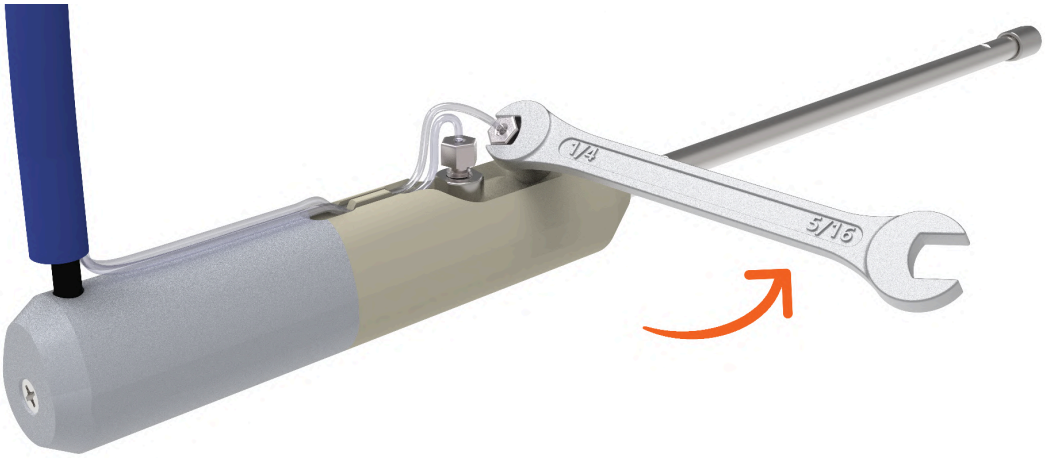
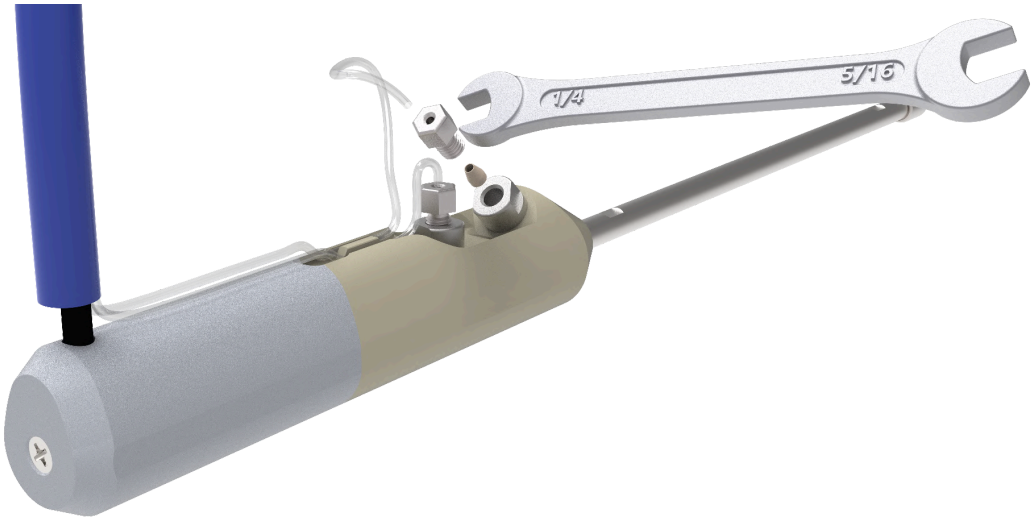
Replacement of External Probe Tubes

If one of the sample tubes connected to the **Probe Port** becomes clogged, it can be replaced.
Make sure you have a **replacement tube** available (standard length: **600 mm**).

1) Use a **1/4" wrench** to unscrew the **fitting** that holds the clogged tube connected to the **Coupler**.



2) The end of the tube is inserted into a **conical ferrule**. Carefully remove the tube — you will also need to transfer this ferrule to the new tube.



3) Unwrap the **blue braided sleeve** and replace the old tube inside it with the new one.
4) Reconnect the fitting by following the previous steps in reverse order.

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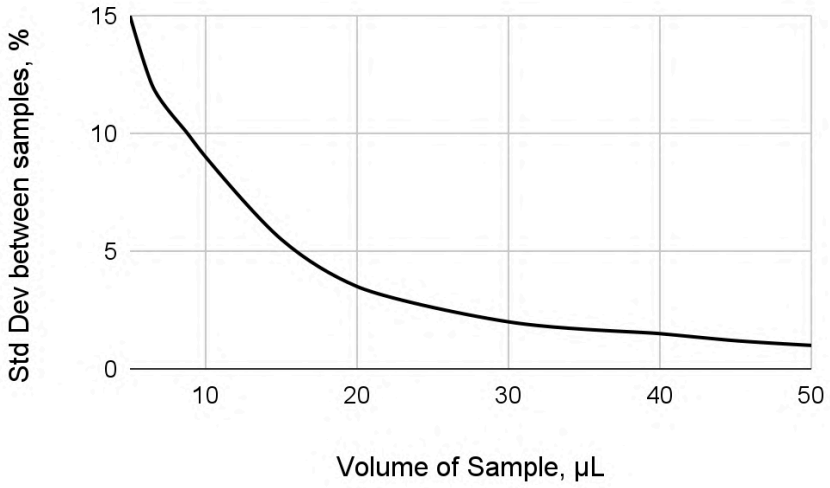
Sampling Accuracy Characteristics

Below are important factors that help optimize sampling parameters to achieve the desired level of accuracy.

1. **Accuracy vs. Sample Volume**
   The graph illustrates how sampling precision decreases as the sample volume decreases. Smaller sample volumes generally lead to reduced accuracy.



2. **Accuracy vs. Diluent Volume**
   The graph shows how the volume of diluent used for sample transfer and tubing rinsing affects the consistency (accuracy) between samples during the sampling process. Proper adjustment of diluent volume can improve accuracy between consecutive samples.

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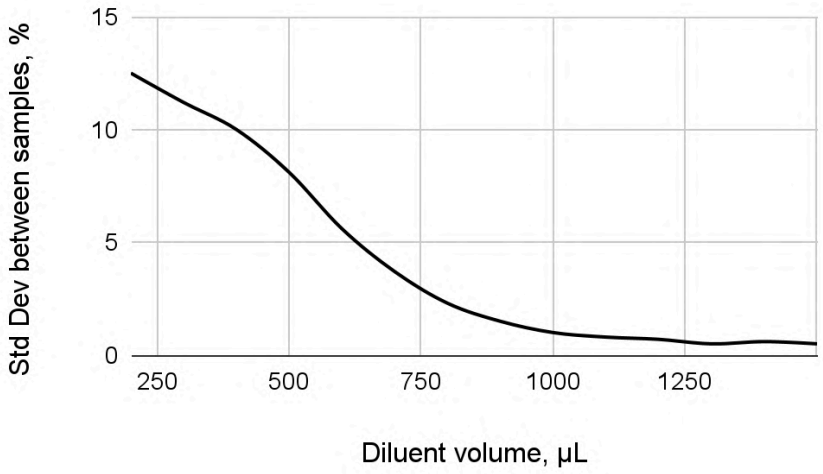
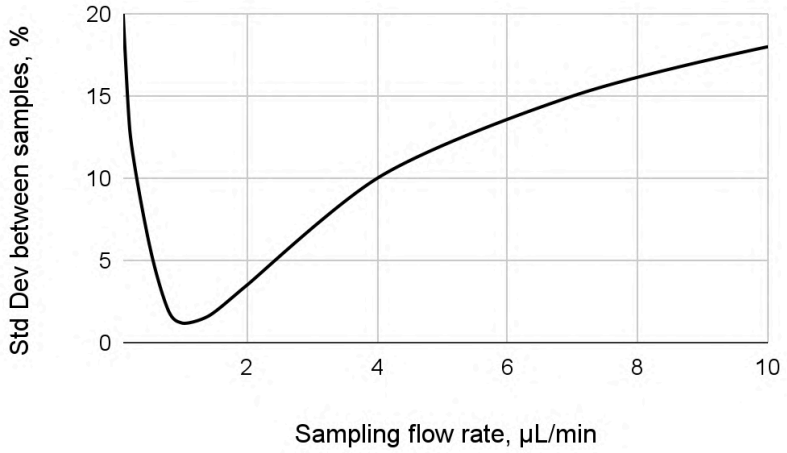


3. **Accuracy vs. Sampling Flow Rate**
   The graph shows the relationship between sample volume deviation and the sampling flow rate used to transfer the sample from the solution into the loop when the Probe is open. The flow rate range considered is from 1 to 10 mL/min. Higher flow rates can lead to greater volume deviations, affecting sampling accuracy.



4. **Accuracy of Syringe Movement**
   The graph presents the deviation between the target and actual volumes during syringe operations performed without additional components (e.g., Probe or Valve). The experiment involved randomly set volumes of distilled water being refilled or discharged by the syringe at various flow rates, ranging from 0 to 48

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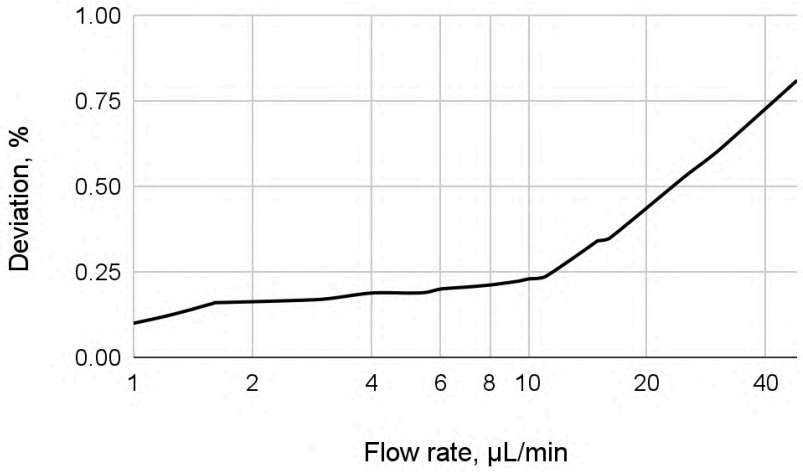
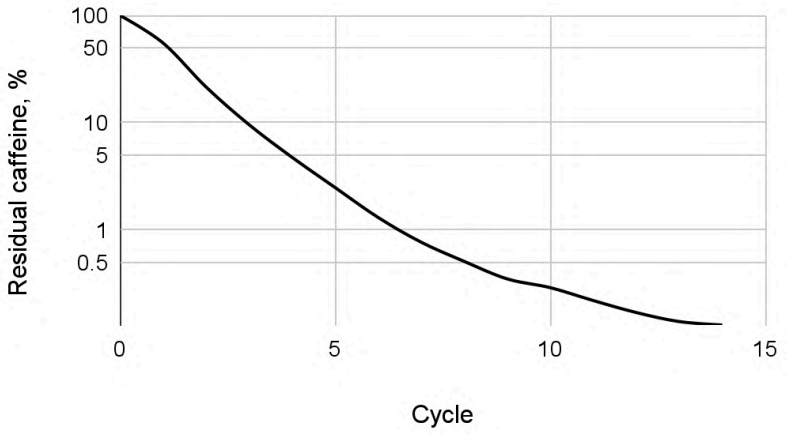
mL/min. In the flow rate range of 0–10 mL/min, the standard deviation in volume is **0.17 µL**.



5. **Syringe Cleaning Efficiency per Cycle**
   The graph illustrates the number of syringe cleaning cycles required to reach the target cleanliness level, expressed as a percentage of residual waste. The y-axis is shown in a logarithmic scale. Caffeine at a concentration of 10 mg/mL was used as the test contaminant.



6. **Effect of Liquid Type and Viscosity on Sampling Precision**
   The graph illustrates how the type and viscosity of a liquid can affect the precision of sampled volumes. In the chart, each candlestick represents the

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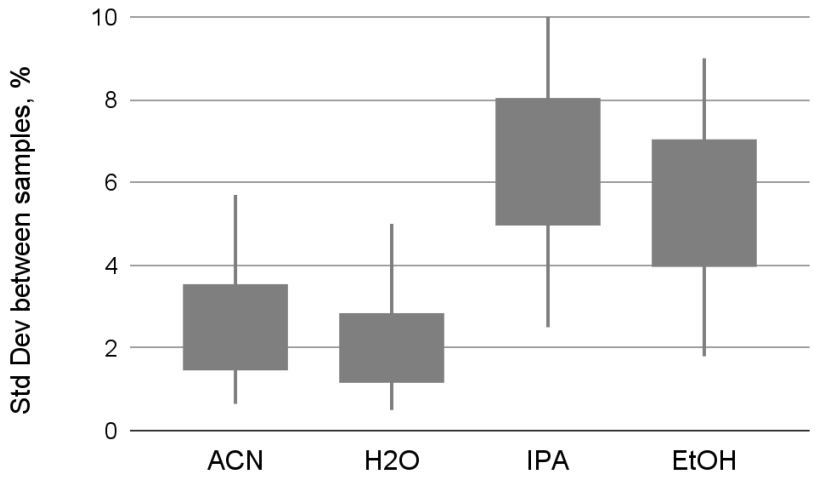
statistical distribution of the standard deviation between samples. The body of the candlestick reflects the 50th percentile (median) of the collected data. The whiskers (minimum and maximum) correspond to the 10th percentile of the distribution. Higher viscosity or varying liquid properties can lead to greater variability in sample volumes.



7. **Pressure Dependence on Liquid Flow Rate and Viscosity**
   The graph shows the relationship between the pressure generated during the Samplify probe cleaning process and the selected flow rate for various liquids. The tested liquids and their viscosities are as follows:
   - **Distilled water** – 1.0 mPa·s
   - **Acetonitrile** – 0.37 mPa·s
   - **Isopropyl alcohol** – 2.4 mPa·s
   - **Propylene glycol** – 57 mPa·s

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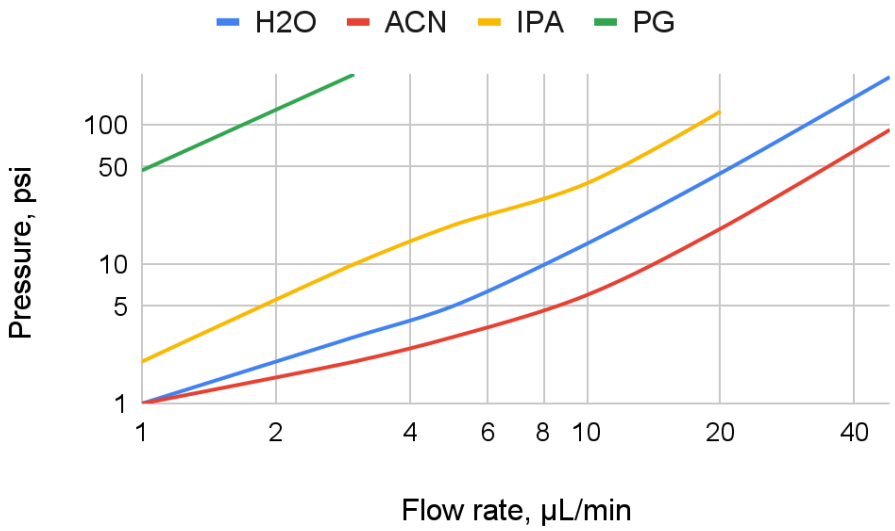

It is recommended to set flow rates so that the resulting dynamic pressure does not exceed:

- 15 psi for low-viscosity (non-viscous) liquids;
- 100 psi for high-viscosity liquids;

Maintaining pressure within these limits helps ensure safe and consistent operation.

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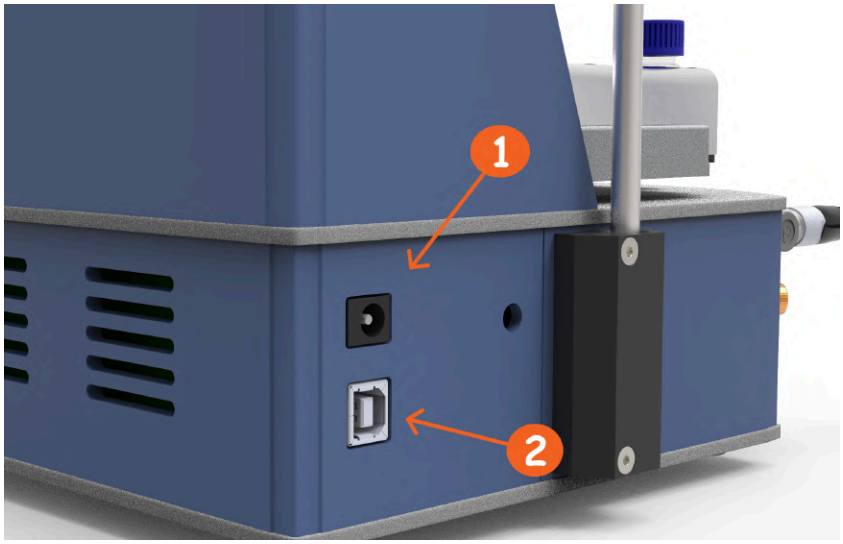
Installing Cable Connection

WARNING! Personal Injury
To prevent personal injury, do not place your fingers or hands near the needle area while the Samplify™ System is in operation.

WARNING! Risk of Electrical Shock or Instrument Damage
Hazard of electrical shock or damage of your instrumentation can result, if the devices are connected to a line voltage higher than specified.

1. Connect the power cable to the power port at the left side of the station.
2. Connect the USB 2.0 type B cable from the Samplify™ Automated Sampling to one of the available USB type A ports on your PC.



CAUTION! "Defective on Arrival" Problems
If there are any signs of damage, do not attempt to install or operate the module. Inspection by SIELC Technologies is required to determine whether the instrument is in good condition or damaged.
➔ Notify your SIELC Technologies sales or service representative about the damage.

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Tubing Connections

Check the configuration and intended use of your Samplify™ Automated Sampling System and connect the tubing accordingly.

PTFE transparent tubing is used for liquid connections in the Samplify system. The standard tubing has an inner diameter (ID) of 0.75 mm and supports a maximum pressure of up to 250 psi. An additional short tube with a 0.5 mm ID is optionally provided for the connection between the valve and the syringe. This tube can be distinguished by its lower transparency and more solid (opaque) color.

WARNING! Toxic, Flammable, and Hazardous Solvents, Samples, and Reagents

The handling of solvents, samples, and reagents may pose health and safety risks. When working with these substances, always follow appropriate safety procedures (for example, wear protective goggles, safety gloves, and lab clothing) as described in the material handling and safety data sheets (MSDS/SDS) provided by the supplier, and adhere to established good laboratory practices.

WARNING! Risk of Short Circuit and Instrument Damage

Do not allow water or other liquids to spill on or into the instrument. Contact with liquids may cause a short circuit and result in serious damage or electrical hazard.

Before you begin, ensure that when you insert the tubing into the fittings, they stick out approximately 3 mm, as shown in the image below.

- **Important Note:** The fittings must be inserted together with the capillaries. Do not insert the fittings beforehand. While inserting the fittings, gently push the capillary toward the port to ensure the end of the capillary extends beyond the fitting tip once it is installed. Tighten the fitting by hand with maximum force, but do not use any tools.

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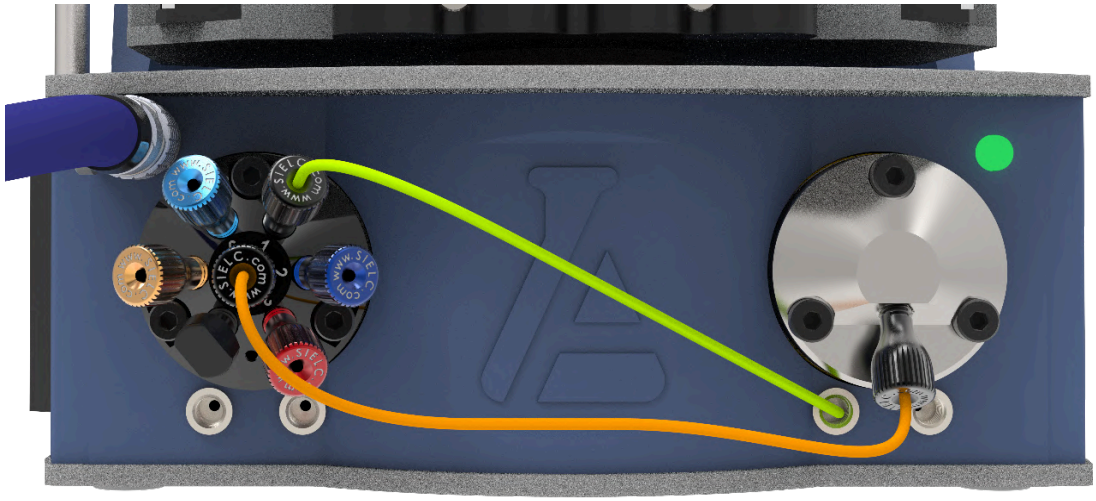
NOTE: The capillaries are marked in **orange** and **green** in the diagram for clarity. Actual tubing colors in your setup are transparent (may differ).



A. Connect the **Samplify™ Probe** to the **Probe Port** on the Samplify station, located near the valve.

B. Connect the **short tube** (orange in the picture) between **valve Port 0 (central)** and the **syringe**. Your kit includes two short tubes with different inner diameters: 0.75 mm and 0.5 mm. The smaller ID tube (less transparent) is more effective at minimizing air bubbles inside the line, which improves sampling accuracy and precision.

C. Connect the **needle tube** (green in the picture), which extends from the left built-in port beneath the syringe to **valve Port 1**. This tube runs from the needle through the entire Samplify station.

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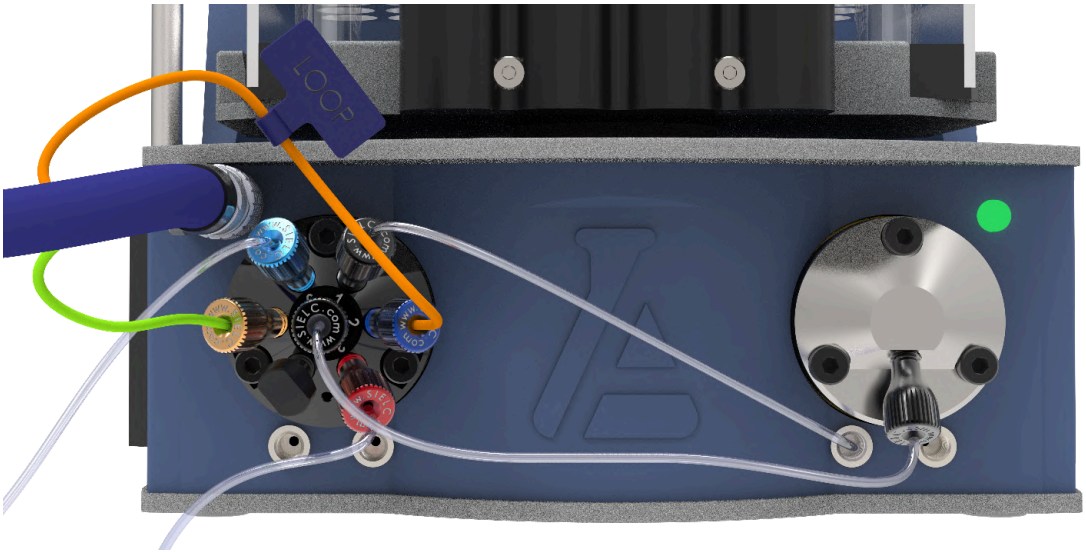
D. Connect a **tube** (orange in the picture) from the **quench reagent bottle** (if used during sampling) to **valve Port 3**. Ensure the tube is equipped with a filter and is fully immersed in the liquid. The liquid must be degassed before use.

E. Connect a **tube** (green in the picture) from the **solvent bottle** to **valve Port 6**. Make sure the tube has a filter and is fully immersed in the liquid. The solvent must also be degassed.

F. Ensure that **valve Port 4** is securely sealed with the **black dead-end fitting**.



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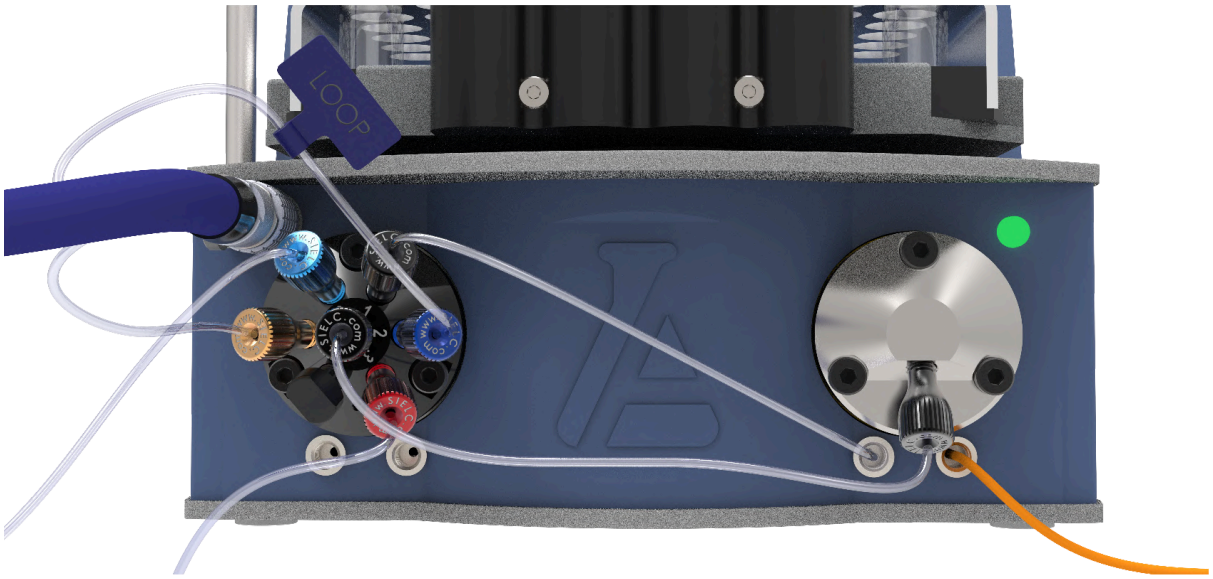
G. Connect the **Samplify™ Probe tube** (orange in the picture) marked with a **Ziptie labeled "LOOP"** to **valve Port 2**. This tube functions as the sample loop. Its replaceable section runs from the Probe Loop port to the Valve port, while the fixed section starts from the initial probe tip.

H. Connect the **Samplify™ Probe tube** (green in the picture) **without a Ziptie** to **valve Port 5**. This tube is used to transfer solvent from the valve to the probe and connects to the Probe Solvent port.



J. Connect the **Waste Port tube** (orange in the picture), which extends from the right built-in port beneath the syringe, to an **empty waste bottle**. This tube runs from the waste port located below the needle home position, passing through the entire Samplify station.

K. Notice! If you observe a bubble in the tubing between **valve position 0 (central)** and the **syringe**, try to eliminate it by adjusting the syringe flow rate and increasing the number of syringe cleaning cycles. Removing air bubbles from this section improves sampling accuracy.

L. Notice! It is highly recommended to degas the solvent before using it for sampling. Degassed solvents produce less bubbles during the suction process.

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Software

The **Samplify™ Automated Sampling System** can be operated using the included **Windows application** or via **direct serial commands** through any terminal emulator. Communication is established over **USB** using an **RS232 virtual COM port**.

Samplify™ Windows Application
A dedicated Windows application is included for: method configuration, monitoring, cycle reporting, and cleaning.

Software Control. See the procedure in "Samplify™ Windows Application"

System Requirements

- Operating System: Windows 7-10 (up to version 22H2)
- Memory (RAM): 2 GB or more
- Disk Space: 20 MB free

Direct Serial Command Control (CLI)
You can also control the Samplify™ system using terminal tools to send **serial commands** directly through the Command-Line Interface (CLI).

- PuTTY – A widely used, open-source terminal emulator. Serves as a terminal interface only; sequences of operations must be programmed separately.

See the procedure in "PuTTY".

- DOMP Browser– A serial command emulator designed to help you understand and interact with the Samplify™ Automated Sampling System.

See the procedure in "DOMP Browser".

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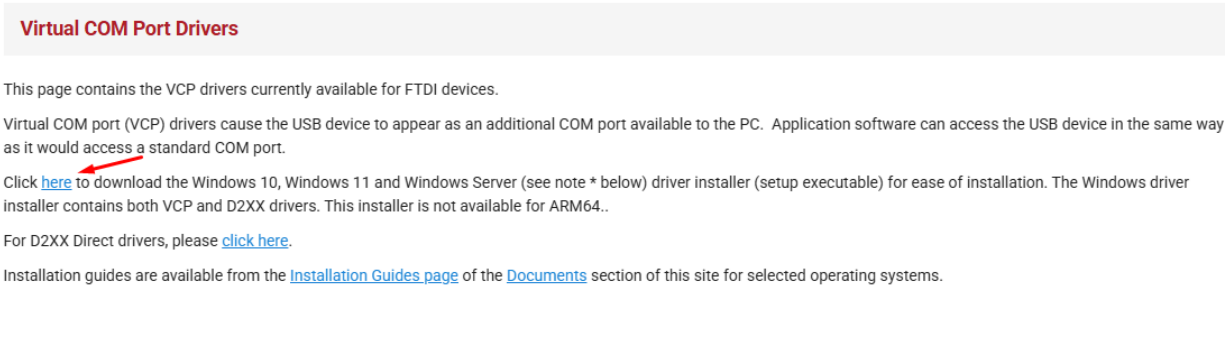
Installing FTDI driver and identifying the COM port

Before using the instrument, ensure that the **FTDI Virtual COM Port (VCP)** driver is installed.

In most cases, the driver is installed automatically when the device is first connected via USB, or it may already be pre-installed on your system. However, if no new device appears in **Device Manager** after connecting the instrument, manual installation is required.

Download the latest driver from: https://ftdichip.com/drivers/vcp-drivers/

After installation, reconnect the instrument and verify that a new COM port appears in Device Manager (Ports (COM & LPT) → **USB Serial Port (COMx)**).



Virtual COM Port Drivers

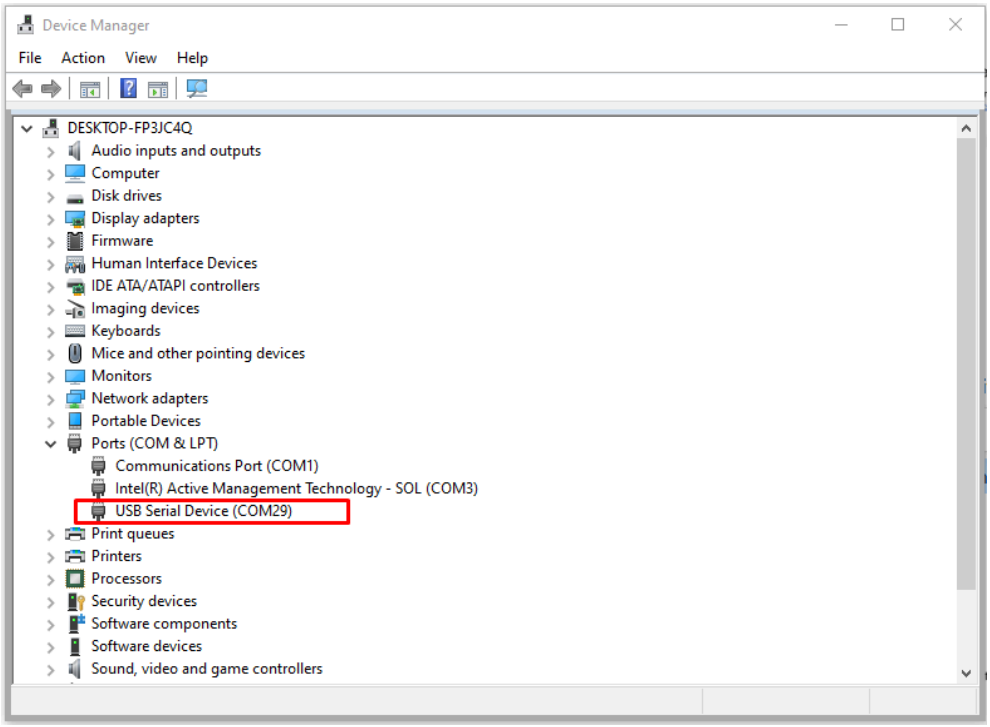
This page contains the VCP drivers currently available for FTDI devices.

Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.

Click here to download the Windows 10, Windows 11 and Windows Server (see note * below) driver installer (setup executable) for ease of installation. The Windows driver installer contains both VCP and D2XX drivers. This installer is not available for ARM64..

For D2XX Direct drivers, please click here.

Installation guides are available from the Installation Guides page of the Documents section of this site for selected operating systems.



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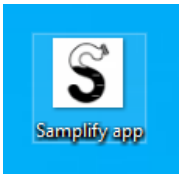
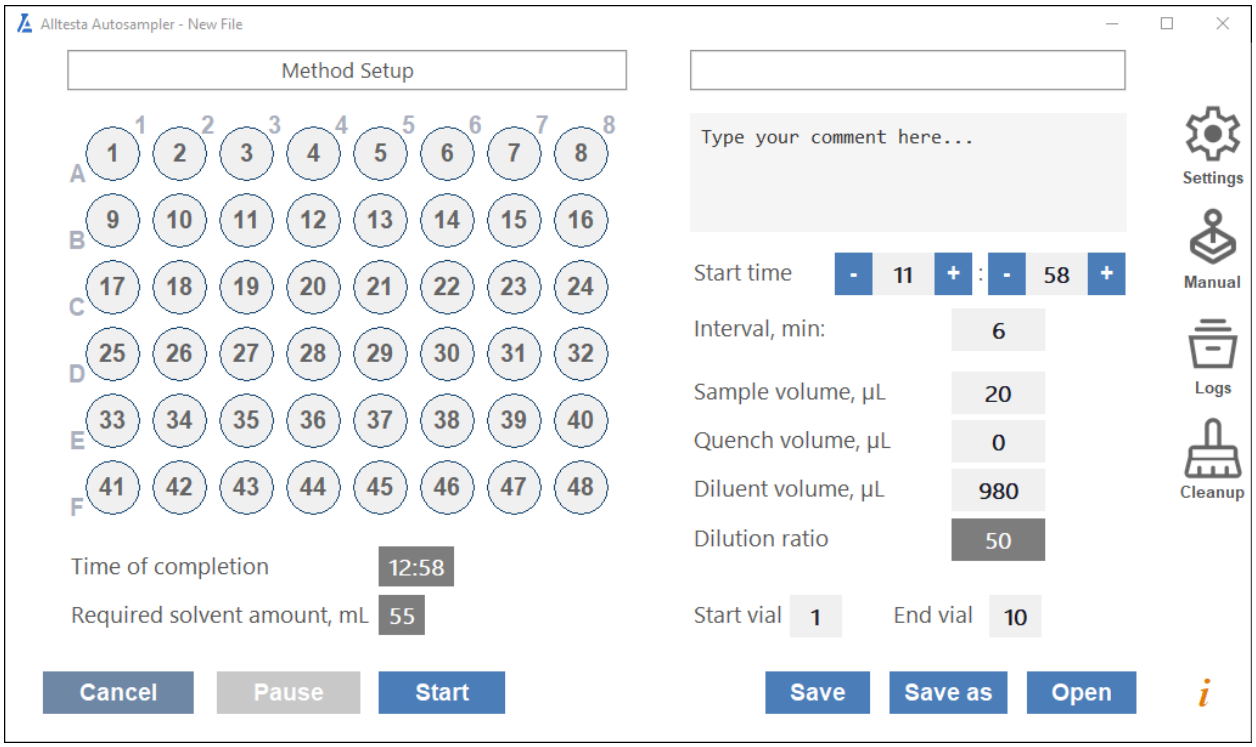
Samplify™ Windows Application



The Samplify™ Windows Application provides a user-friendly interface for configuring, running, and monitoring the operation of the Samplify™ Automated Sampling System. Each screen is designed to simplify method setup and system operation, offering intuitive access to the most important functions

Start Screen

The Start Screen is the main workspace for setting up a new sampling method.



Vial Selection Panel

- **Vial Map** (Tray size: 48 or 96 vials) – a graphical representation of the tray layout. Each circle corresponds to a vial position. Selected vials are highlighted.
- **Start Vial / End Vial** – define the range of vials used in the current method. This ensures the instrument knows which positions contain vials for running.

Progress Estimation

- **Time of completion** – automatically calculated end time of the method based on number of vials, sample volume, and interval.

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- **Required solvent amount (mL)** – estimated solvent consumption for the run, useful for preparation.

Sampling Parameters

- **Notes** – users can enter comments or details, such as quench solution composition or special remarks (e.g., “Quench solution is H_2O + ACN 80%”). Limited to 200 characters.
- **Start Time** – use the “+” and “**–**” buttons to set the exact time when sampling should begin. Useful for scheduling unattended runs.
- **Interval (min)** – time between consecutive samples. Lower flow rates require longer minimum intervals.
- **Sample Volume (µL)** – amount of liquid withdrawn from the reactor for each sample.
- **Quench Volume (µL)** – volume of quench reagent added to each vial before sampling (optional).
- **Diluent Volume (µL)** – amount of diluent used to adjust concentration and deliver the sample to a vial.
- **Dilution Ratio** – calculated automatically based on entered volumes.
- To adjust other parameters, click the "Settings" button in the top-right corner.

Action Buttons

- **Start** – begins the sampling sequence. Ensure there are no warnings in the top panel; if there are, adjust the parameters to meet the requirements.
- **Pause** – temporarily stops the method without canceling it. The pause takes effect after the current vial is processed. To resume sampling, click Start again. Lost time due to the pause is shown in the vial panel and recorded in the log history.
- **Cancel** – immediately stops the current run. Press again to reset the vial map. For a non-emergency stop: press **Pause**, wait for the step to finish, then press **Cancel**. For an emergency stop: press **Cancel** immediately.
- **Save** – saves the current method configuration to a file for future use.
- **Save As** – saves the method under a different name.
- **Open** – loads a previously saved method configuration.

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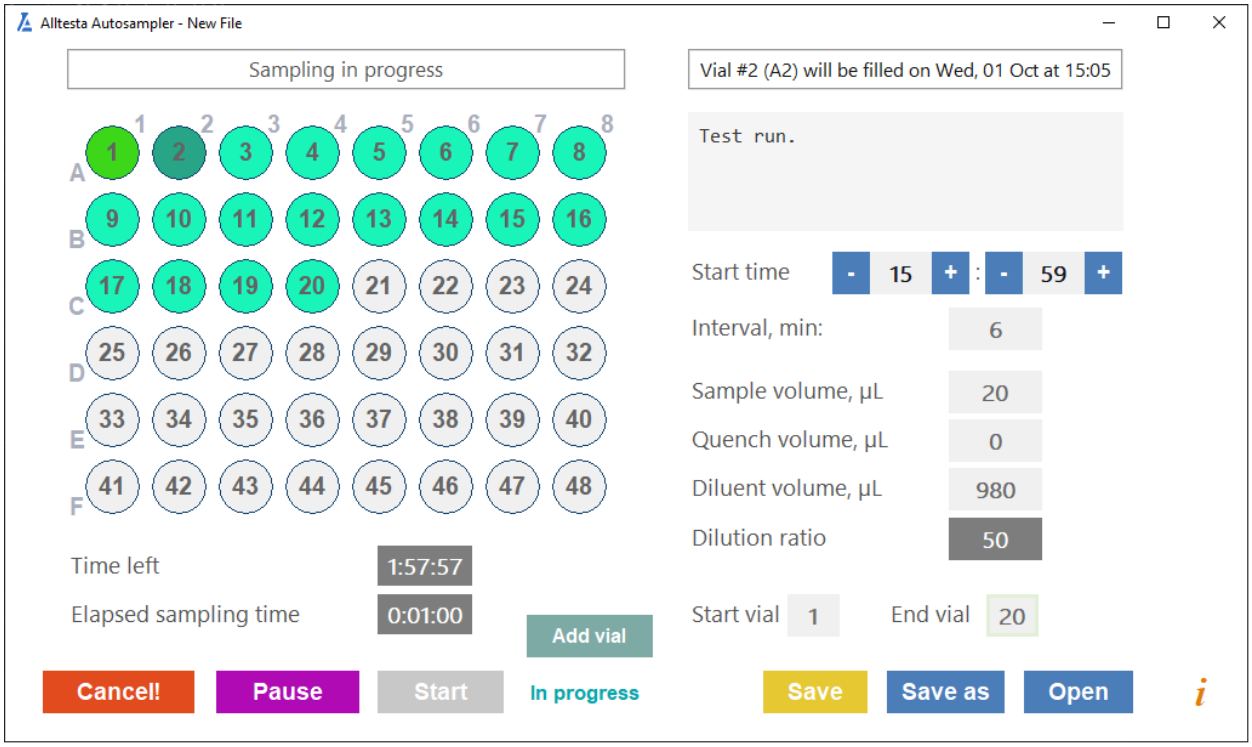
Run Screen

The **Run Screen** appears after pressing the Start button on the previous screen. It displays the sampling progress, elapsed time, and remaining time.



Top Panels

During sampling, the left top panel displays the steps of the sampling process, while the right top panel shows the status of the selected vial — either when it was filled or when it is scheduled to be filled.
Sampling parameter fields (right column) become inactive during the process.

Vial Map

During sampling, vials on the map change color to indicate the operation currently being performed or what has already been done to each vial. You can click on any vial to view its status.

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Color Description

– The vial is idle and waiting for processing.

– The quenching process is currently being performed.

– The sampling process is being performed into an empty vial.

– The sampling process is being performed into a vial that already contains quenching solution.

– The vial contains only quenching solution.

– The vial contains only the sample, without quench.

– The vial contains both the sample and quenching solution.

Action Buttons

- **Add vial** - if you suddenly need additional samples, you can click this button as many times as needed. However, make sure that the corresponding number of new vials has also been physically placed into the tray and you have enough solvent.
- **Pause** – temporarily stops the method without canceling it. The pause takes effect after the current vial is processed. To resume sampling, click the **Start** button again. Lost time due to the pause is shown in the vial panel and recorded in the log history.
- **Cancel** – immediately stops the current run. Press again to reset the vial map.

For a non-emergency stop: press **Pause**, wait for the step to finish, then press **Cancel**. For an emergency stop: press **Cancel** immediately.

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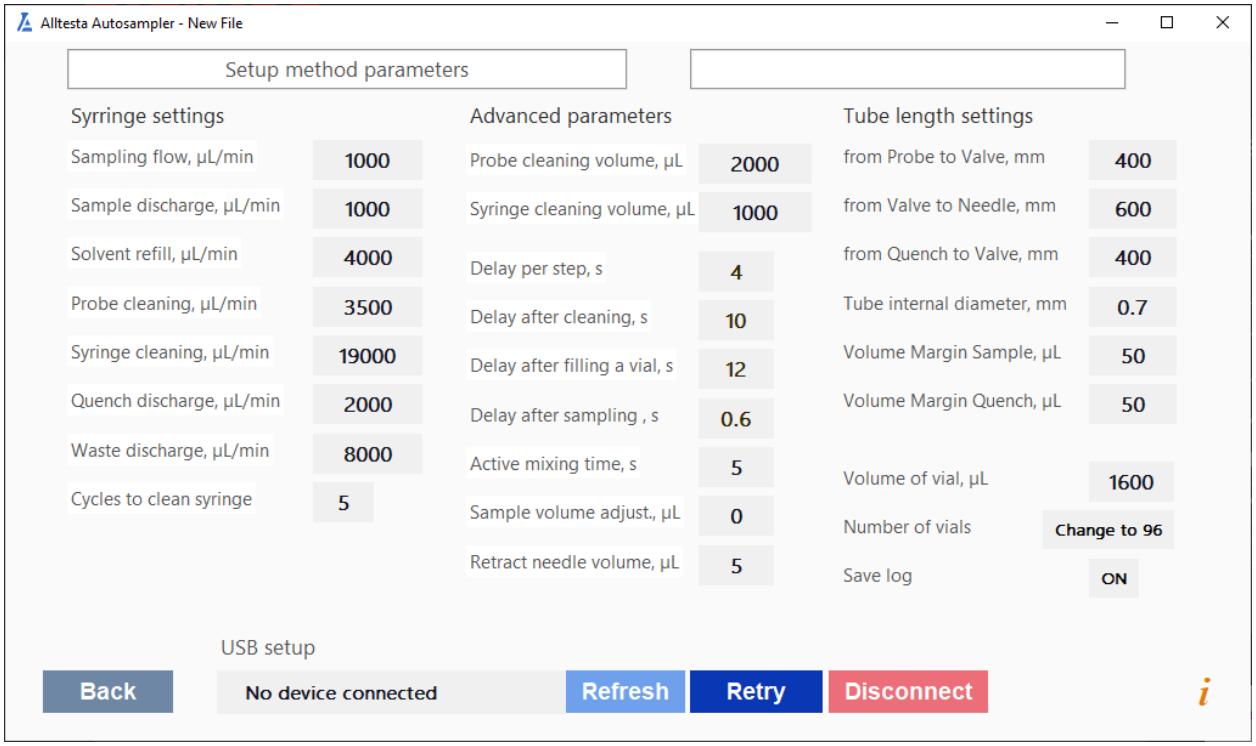
Settings

The **Method Settings** screen provides advanced configuration options to fine-tune how the system performs each step.



Functions Include:

- **Syringe Settings** – control pump flow rates at different stages of sampling to ensure maximum precision.
- **Advanced Parameters** – fine-tune the sampling process for optimal performance.
- **Hardware/Software Configuration** – reflects physical changes to the device in the software, ensuring the correct hardware profile is used.
- **Device Selection** – if multiple Samplify™ units are connected to the same computer, the operator can choose which instrument to control.

Syringe Settings

- **Sampling Flow (µL/min)** – flow rate at which the sample is drawn from the reactor into the probe loop.
- **Sample Discharge (µL/min)** – flow rate at which the sample is dispensed from the probe loop into a vial. Depends on the viscosity and surface tension of the liquid.

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- **Solvent Refill (µL/min)** – flow rate at which the syringe is refilled with solvent during cleaning or rinsing. Higher values shorten cycle time but increase the risk of bubbling.
- **Probe Cleaning (µL/min)** – flow rate used to clean the probe after the sampling step. Higher values reduce cycle time but increase dynamic pressure, which may prolong pressure recovery time.*
- **Syringe Cleaning (µL/min)** – flow rate for rapid bulk filling of the syringe during cleaning cycles. Higher rates improve mixing and flushing efficiency.
- **Quench Discharge (µL/min)** – flow rate at which quench reagent is dispensed into a vial. Depends on the viscosity and surface tension of the liquid.
- **Waste Discharge (µL/min)** – flow rate at which liquid is drawn into the waste container during cleaning.
- **Cycles to Clean Syringe** – number of rinse cycles used to clean the syringe. More cycles with smaller volumes are recommended.

Advanced Parameters

- **Probe Cleaning Volume (µL)** – volume of solvent used to flush the probe. Larger volumes improve cleaning but increase cycle time.
- **Syringe Cleaning Volume (µL)** – volume of solvent used to flush the syringe. More cycles with smaller volumes are recommended for better cleaning efficiency.
- **Delay per Step (s)** – delay between each operation in the cycle. Helps relieve excess pressure before valve rotation for viscous liquids.
- **Delay After Cleaning (s)** – pause after cleaning steps to allow pressure recovery before the next operation, especially at high flow rates.
- **Delay After Filling a Vial (s)** – short pause after dispensing the sample to let residual drops fully drain.
- **Delay After Sampling (s)** – short delay to allow the sample to be fully aspirated from the reactor. Higher values may cause solvent at the needle tip to enter the reactor.**
- **Active Mixing Time (s)** – duration of tray shaking to ensure proper mixing in vials.
- **Sample Volume Adjust (µL)** – manual correction for systematic volume error.
- **Retract Needle Volume (µL)** – small volume aspirated back after filling a vial to prevent droplet formation at the needle tip and improve precision.

*** - Why is pressure recovery needed**

The internal volume of the probe is relatively large and includes elastic components (such as seals), air bubbles, and moving parts with springs. This creates residual stored energy (deformation), which may cause a few microliters of liquid to continue exiting the probe tubing (ports 2 and 5) after cleaning.

If internal pressure is not allowed to stabilize, it may lead to reduced sampling accuracy and possible solvent carryover into the quench vial.

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**** - Relationship Between "Delay After Filling a Vial" and "Sampling Flow Rate"**

The sample is aspirated through a solvent-filled probe circuit, which can lead to several unwanted effects: a) Mixing of the sample with residual solvent in the probe tip during aspiration; b) Solvent entering the reactor solution from the probe tip; c) Diffusion of the reactor solution into the solvent due to density differences between the two liquids. By adjusting **Delay After Filling a Vial**, **Sampling Flow Rate**, and **Sample Volume Adjust.**, it is possible to find a compromise between: sample volume accuracy, reproducibility between samples, and the extent of mixing between the sample and residual solvent. This is a highly sensitive parameter. When planning an experiment, pay close attention to the density of the liquids, sample volume, and sampling flow rate.

Tube Length Settings

(Do not change these fields unless you have a custom configuration.)

- **From Probe to Valve (mm)** – physical tubing length between the probe's exit port and the valve. Standard length: 600 mm.
- **From Valve to Needle (mm)** – physical tubing length from the valve to the dispensing needle. Standard length: 600 mm.
- **From Quench to Valve (mm)** – physical tubing length for the quench reagent line. The included standard tube is 500 mm.
- **Tube Diameter (mm)** – internal diameter of the tubing. Standard PTFE tubing has an ID of 0.75 mm (0.03").
- **Sample Volume Margin (µL)** – safety margin volume between the sample and the waste port, used when drawing excess solvent volume through the tubing before filling a vial. Higher values improve safety but reduce the maximum available sample volume.
- **Quench Volume Margin (µL)** – safety margin to ensure the quench reagent fully fills its tubing before the syringe is refilled.

Software Configuration

- **Vial Volume (µL)** – capacity of each vial in the tray. Used to prevent overfilling. Standard capacity for 48-vial trays is 1.6 mL.
- **Number of Vials** – defines the tray configuration (e.g., 48, 96, 384).
- **Save Log (ON/OFF)** – when enabled, saves run data to the computer for future reference.

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To save changes made in the Settings, go back to the previous page and click the "Save" button.

USB Setup / Connection Status

This section of the **Method Settings** screen shows the connection status between the software and the Samplify™ device.

Controls and indicators:

- **Device Status** – displays *"No device connected"* if no instrument is detected, or *"Connected to COMx"* when the Samplify™ system is properly recognized.
- **Refresh** – scans all available USB ports for connected instruments. If found, displays a dropdown menu with available COM ports.
- **Retry** – attempts to re-establish communication with the device after a failed connection. Press to automatically connect to an available device.
- **Disconnect** – safely terminates communication with the connected instrument. Recommended before unplugging the USB cable or switching devices.
- **Back** – returns to the previous screen.

NOTE: If the device does not appear as connected after plugging in, press the Retry button. Make sure the FTDI driver is installed and the correct COM port is available.

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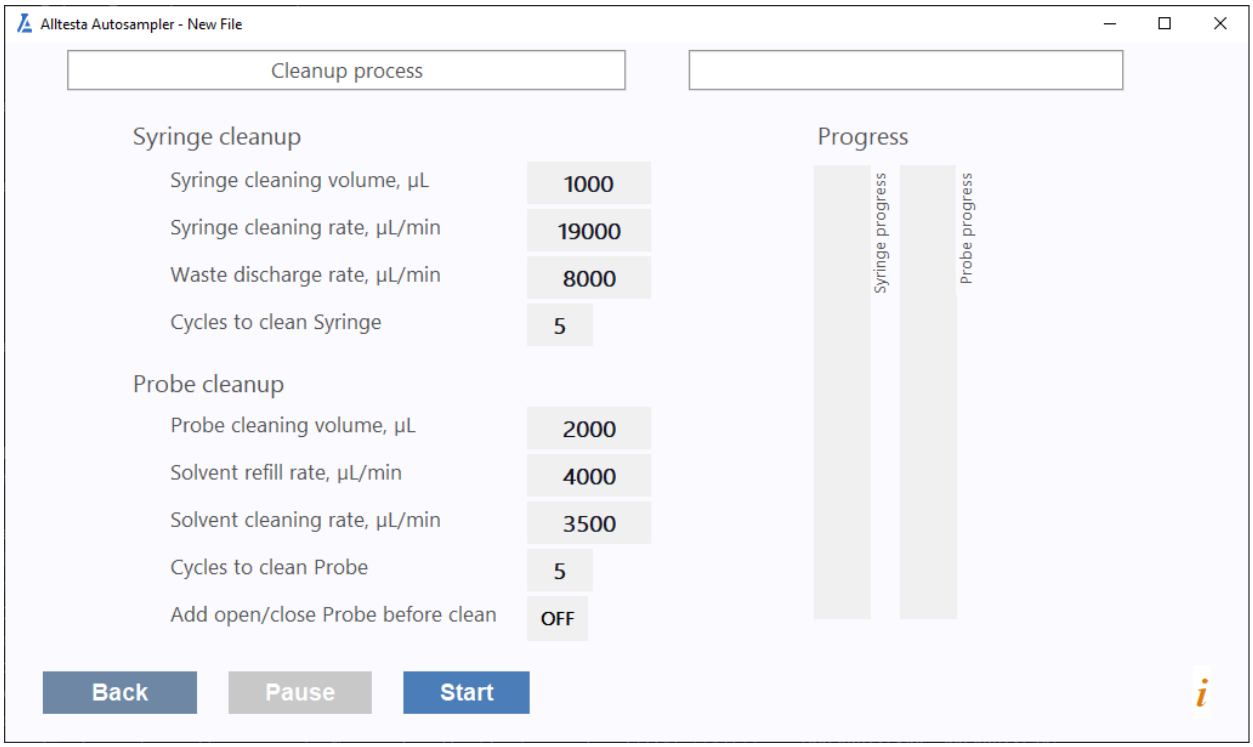
Cleaning Mode

The **Maintenance** screen allows configuration of automatic preliminary cleaning procedures for the syringe and the probe before a method launch.



Syringe Cleanup

- **Syringe cleaning volume (µL)** – amount of solvent used to flush the syringe during one cleaning cycle. Best results are typically achieved with smaller volumes and a higher number of cycles.
- **Syringe cleaning rate (µL/min)** – solvent refill rate during syringe cleaning. Higher rates improve mixing between residual liquid and fresh solvent, speeding up the process. However, with viscous liquids, excessive flow rate may lead to gas bubble formation.
- **Waste discharge rate (µL/min)** – flow rate at which used solvent is expelled into the waste container. Faster rates improve residue removal efficiency.
- **Cycles to clean Syringe** – number of full rinse cycles to be performed. More cycles may be needed after handling sticky liquids or when switching between immiscible solvents.

Probe Cleanup

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- **Probe cleaning volume (µL)** – volume of solvent used to flush the probe in each cycle. The dead volume of the probe is 0.8 mL, so using a higher volume improves cleaning efficiency.
- **Solvent refill rate (µL/min)** – rate at which solvent is drawn into the syringe before probe cleaning. For low-viscosity solvents, a higher refill rate can be used.
- **Solvent cleaning rate (µL/min)** – rate at which solvent is discharged during probe flushing. A lower rate can help to prevent excessive pressure buildup. A high flow rate can help remove air bubbles through increased pressure.
- **Cycles of probe cleaning** – number of flushing cycles performed to clean the probe.
- **Add open/close probe before clean (ON/OFF)** – when enabled, the probe briefly opens before cleaning to release part of the solvent directly from the tip instead of sending it through the tubing. This can improve cleaning efficiency. Ensure that the probe tip is placed in a separate waste container filled with solvent.

Progress Indicators

- **Syringe Progress** – visual progress bar showing the completion status of syringe cleaning cycles.
- **Probe Progress** – visual progress bar showing the completion status of probe cleaning cycles.

To skip cleaning of a component, set its cycle count to 0.

Press the **Start** button to begin the cleaning process.

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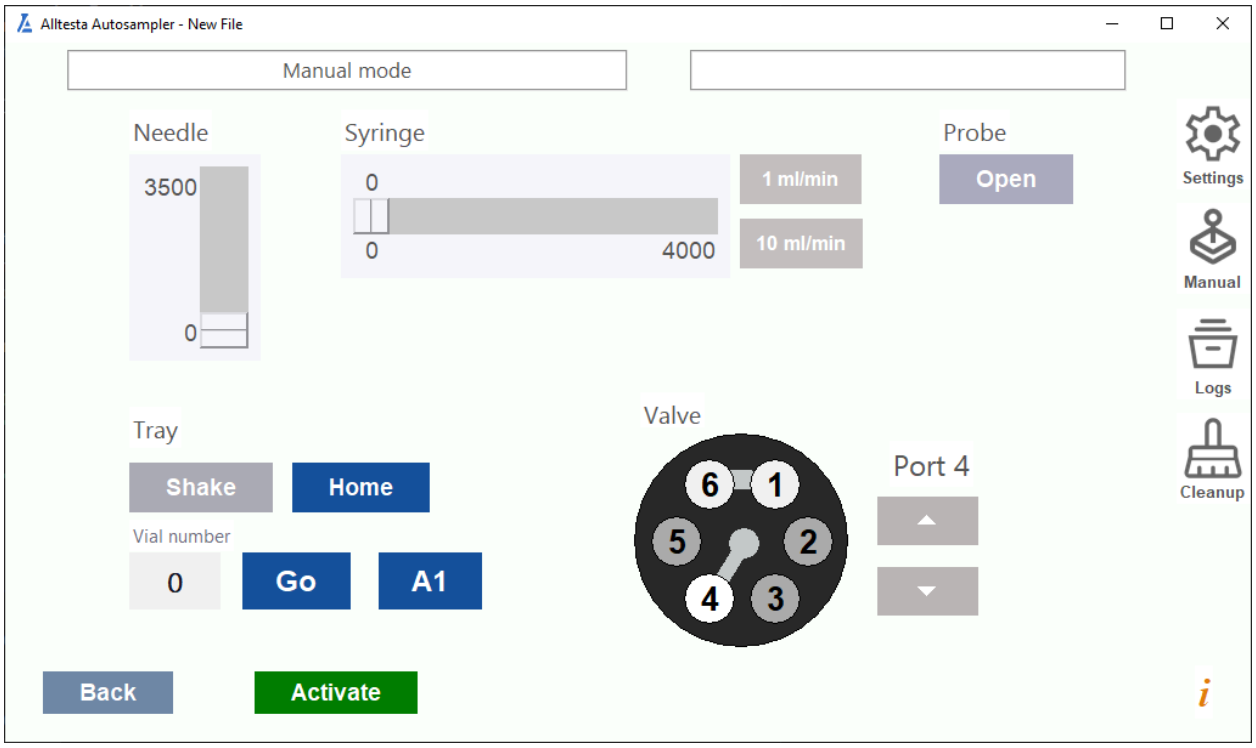
Manual Mode

The **Manual Mode** screen allows direct operation of the system's components without running a predefined method. It is mainly used for diagnostics, testing, and maintenance.



Needle Control

Needle Slider (0–3500) – controls the vertical position of the needle. The value corresponds to a height from 0 to 3.500 centimeters. Use the slider to manually raise or lower the needle during testing.

Syringe Control

- **Syringe Slider (0–4000)** – sets the syringe plunger position, directly controlling the liquid volume in the syringe chamber from 0 to 4,000 microliters.
- **1 mL/min** and **10 mL/min buttons** – quick controls to set the syringe flow rate for manual refilling or discharging.

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Probe Control

Probe Open button – opens the probe tip for 3 seconds. When open, liquid can flow through the tip; when closed, the internal channel is sealed.

Tray Control

- **Shake** button– activates tray shaking for 3 seconds to mix vial contents.
- **Home** button– moves the needle and tray to the home (waste port) position.
- **Vial number field** – enter a vial number and press **Go** button to move the tray and needle to that position.
- **A1** button – shortcut to move the needle and tray directly to vial A1.

Valve Control

- **Valve diagram (ports 1–6)** – visual display of the multiport valve showing which ports are currently connected.
- **Arrow buttons (Port selection)** – rotate the valve to connect the syringe or probe to a specific port, enabling manual routing of liquid between different channels.

Activate Button – shown when the Samplify™ is not connected to the PC. Click to let the software search for and connect to an available device.

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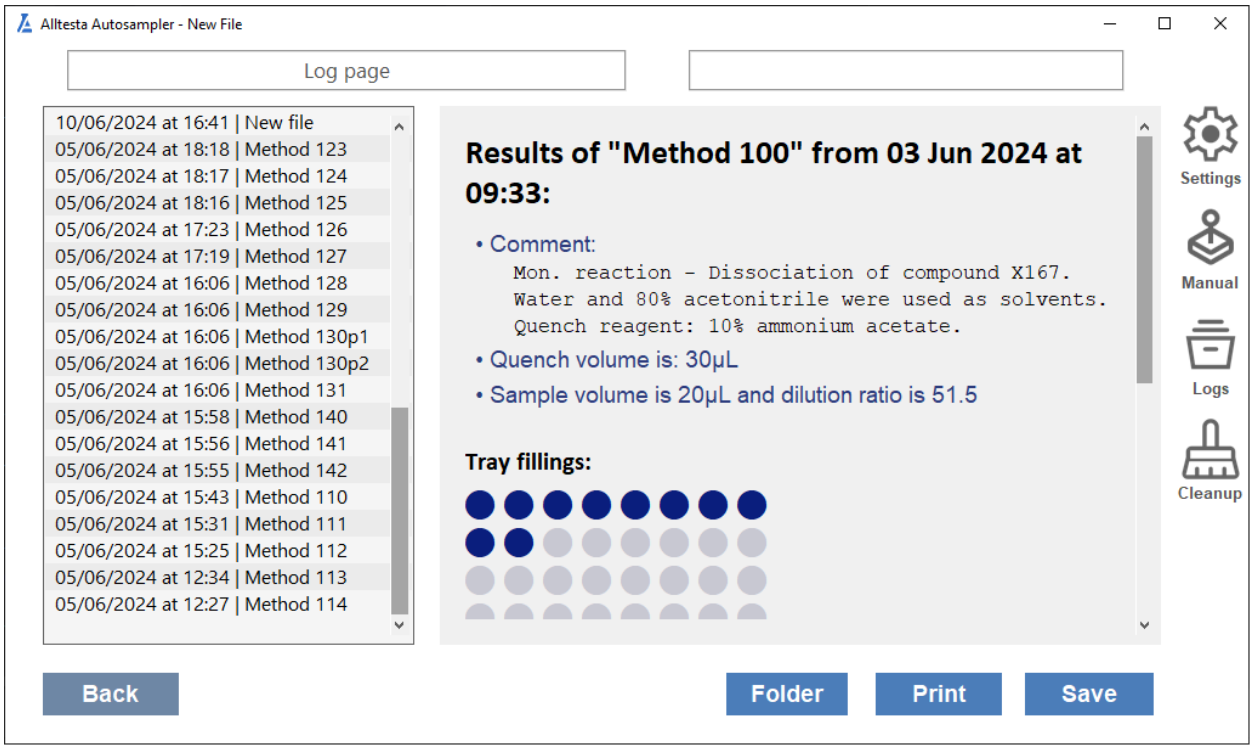
Logs page (Run History)

The **Logs Page** provides access to the history of executed methods. When logging is enabled, a summary of each run is automatically saved to a file. This section allows you to review, open, and print past results.

Log files are stored in the folder:
~/Documents/Alltesta/log



File List

The left panel displays a list of saved log files sorted by date (newest to oldest). Each entry includes the creation date, time, and method name. Selecting a file loads its contents into the **Preview window**.

Preview Window

The right panel shows the contents of the selected file, including: Method name, Date, Comment field, Quench and sample volumes, Dilution ratio, Time of vial filling.

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Active Buttons

- **Folder** – opens the folder containing saved log files.
- **Print** – sends the selected file to the most recently used printer.
- **Save** – allows you to save the selected file with a custom filename and location.

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Warning Descriptions

If the entered parameters do not meet the required conditions, a red warning message will appear in the right top panel, as shown in the example below. The field(s) that require correction will be highlighted with a red (orange) border. The most common warnings are described below.

- **Minimum Interval Time** – the entered time is too short based on the current settings (volumes and flow rates) and cannot be physically performed. To reduce sampling time, consider decreasing delays, lowering cleaning and diluent volumes and increasing flow rates for high-volume steps.
- **End vial must be ≥ start vial** - the filling sequence must be numerically ascending (from lowest to highest). Therefore, the end vial number must be greater than or equal to the start vial.
- **The start vial is less than 1** - the first vial is 1 (A1).
- **Minimum rate is 10µL/min** - this is the minimum allowed flow rate for all syringe settings.
- **Minimum Sample volume is 5µL** - this is the lowest volume the probe can reliably draw from the reactor. Volumes below this value result in poor reproducibility.
- **Total volume exceeds Vial volume** - the combined volume of sample, quench, and diluent exceeds the maximum capacity of the selected vial. You can adjust the vial volume in the Settings.
- **Volume of syringe is not enough** - The sum of the entered sample volume and the probe loop volume exceeds the syringe's maximum capacity of 4000 µL.

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- **Sample vol. exceeds tube volume** - The sample volume is greater than the internal volume of the probe tube connecting the probe exit port to the valve. Reduce the sample volume or replace the probe tube with a custom length.

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Maintenance

Cleaning the Module

Wipe the module case with a soft cloth slightly dampened with water or a mild detergent solution.

WARNING! Do not allow liquids to enter the electronic compartment, as this can cause shock hazards or damage the module.

WARNING! Risk of Electrical Shock or Instrument Damage

Hazard of electrical shock or damage of your instrumentation can result, if the devices are connected to a line voltage higher than specified.

External Samplify™ Probe Cleaning

In addition to automated cleaning cycles, the **Samplify™ Probe** can be externally rinsed to ensure thorough removal of residues. This procedure is recommended after working with viscous, sticky, or strongly adsorbing samples.

Procedure:

1. Prepare a beaker or vial filled with an appropriate cleaning solvent (e.g., water, water–organic mixture, or another solvent compatible with the sample).
2. Place the probe tip directly into the solvent container.
3. Aspirate and dispense the solvent several times through the probe.
4. If necessary, repeat with a second solvent (e.g., stronger organic or detergent solution) to remove persistent residues.

Software Maintenance. See the procedure in "Maintenance (Cleaning and Service)"

5. After rinsing, carefully wipe the outside of the probe with a clean lint-free cloth or tissue to remove any remaining droplets.
6. Finally, run at least one standard internal cleaning cycle to flush the syringe and valve system.

NOTE:

- External probe cleaning is especially important when switching between samples with high risk of cross-contamination.
- Always dispose of used solvent in accordance with laboratory safety procedures.
- Do not use solvents that may damage seals, tubing, or the Probe surface.

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Technical Specification

Parameters	**Samplify™ Automated Sampling System** Standard configuration
Dimensions (WHL)	160 x 145 x 195 mm / 6.3 x 5.71 x 7.68 in
Weight	2.3 kg / 5 lb
Syringe Capacity	4000 µL (up to 200psi) Stainless Steel Chamber
Draw/refill rates	Up to 48,000 µL/min
Pressure	Up to 250 psi (14 bar)
Plate	• 48 vials • 96-well plate
Needle length	36mm
Volume Accuracy	1 µL
Wire Communication	RS232 Virtual COM port via USB type B
Materials	in contact with liquid SS316, PTFE, PEEK, Vespel
Inlet/Outlet	Thread 10-32 UNF compression type
Samplify™ Probe	
Dimensions (WHL)	Base 1 x 1 inch, Tube DIA ¼ inch. Immersion length up to 6 inch
Loop	L x ID: 600 mm x 0.75mm, 250µL
Materials	in contact with liquid SS316, PTFE, PEEK
Sample volume	From 5 to 250 µL
Max. working environment pressure	120 psi (8 bar)
Max. working temperature	200 °C

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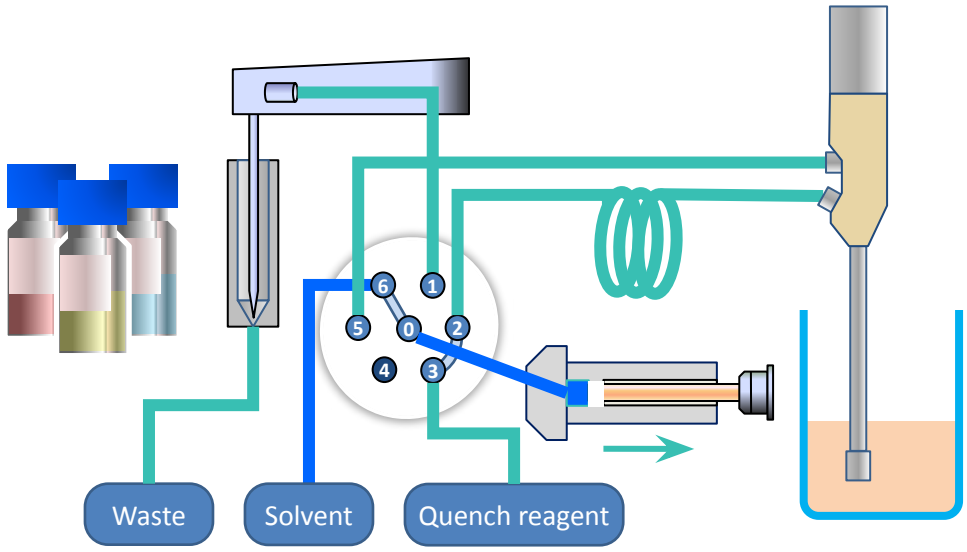
Flow Diagram: Syringe Cleaning

Operation:

Schematics:

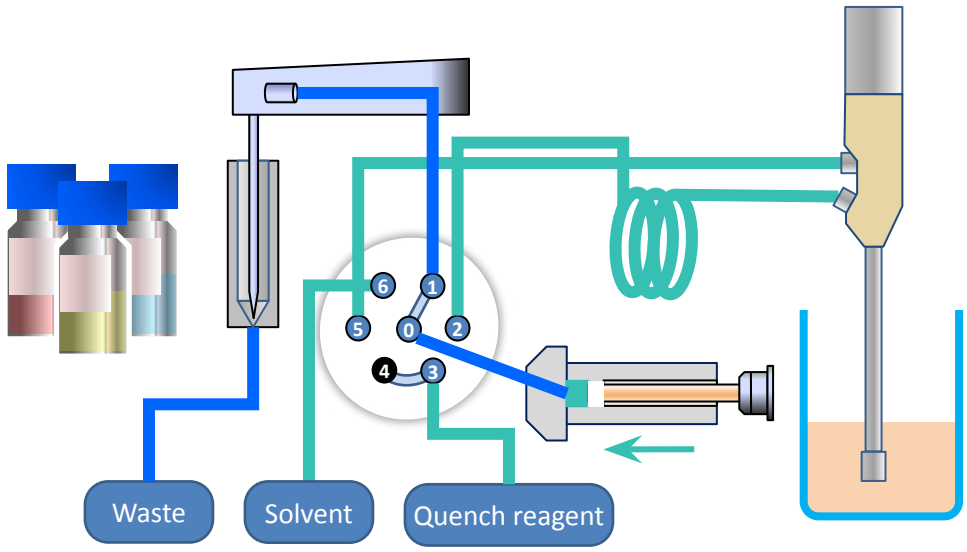
1 Refilling Syringe with Solvent

Refilling the syringe with solvent to wash it from the previous solution.
It is recommended to set a smaller Syringe cleaning volume to ensure efficient solvent consumption and save time. It is also recommended to fill the syringe at high refill rate to provide better mixing.



2 Emptying Syringe to Waste

Dispensing solvent from the syringe to waste. Repeat the cycle several times, depending on acceptable carryover level.



Repeat the required number of times

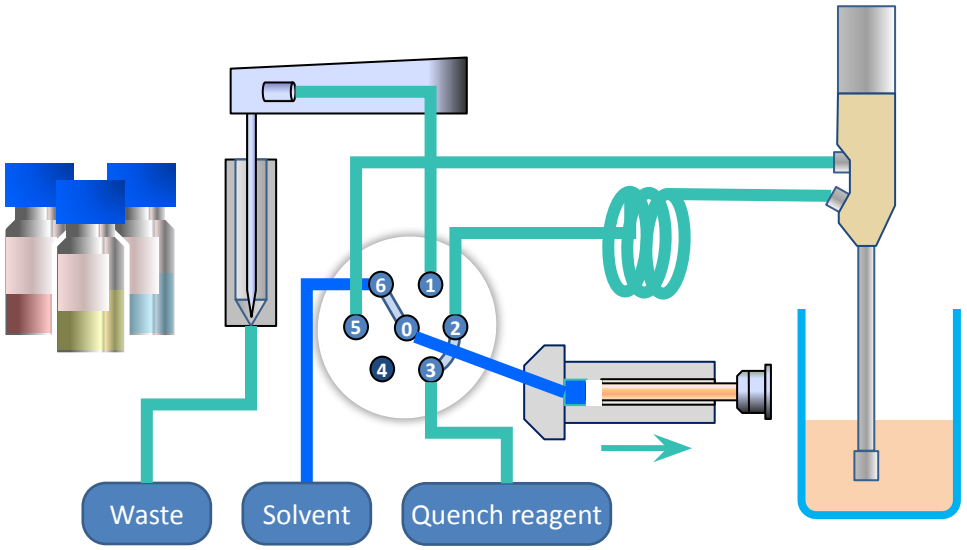
Flow Diagram: Probe Cleaning

Operation:

Schematics:

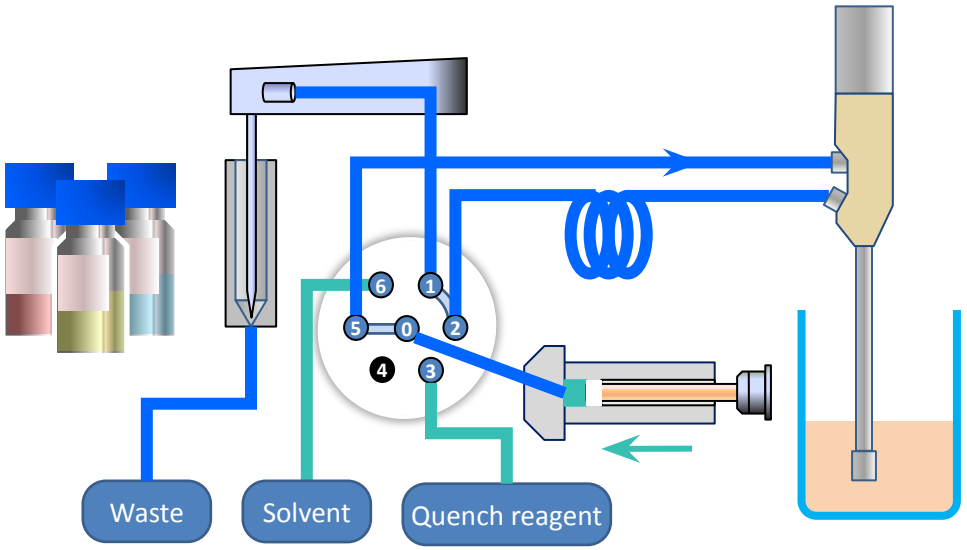
1 Refilling Syringe with Solvent

Refilling the syringe with solvent for probe cleaning. Internal volume of the probe is 770 µL, use sufficient amount to be able to replace entire probe content.



2 Cleaning the Probe with Solvent

Running solvent through the probe to waste to clean the internal flow path. Avoid using an excessively high solvent cleaning rate, especially with high-viscosity liquids. However, a higher flow rate may help generate pressure to dissolve air bubbles trapped inside the probe.
To assist air removal, gently shake the probe and invert it during the cleaning process. It is highly recommended to reduce all the air bubbles in the probe before starting the sampling process to achieve higher accuracy.



Repeat the required number of times

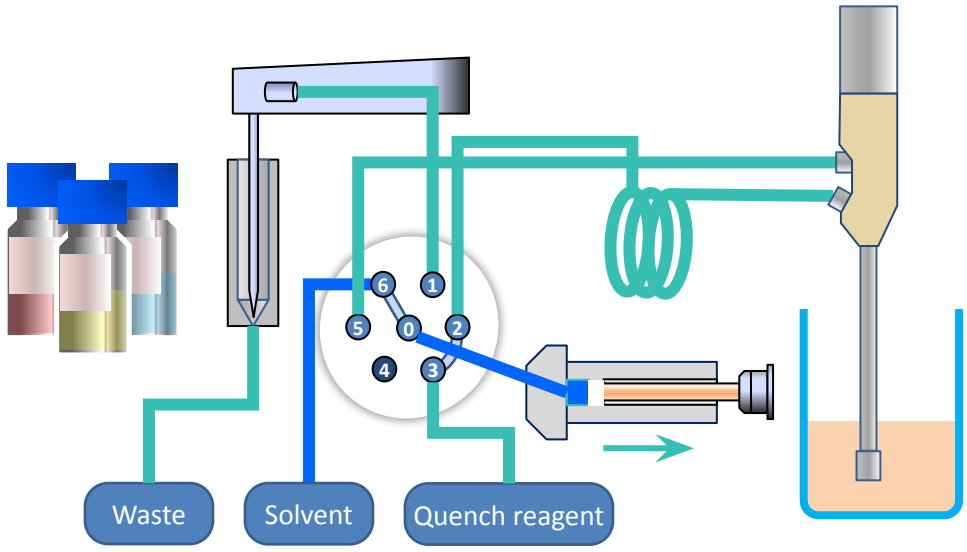
Flow Diagram: Probe Cleaning with opening

Operation:

Schematics:

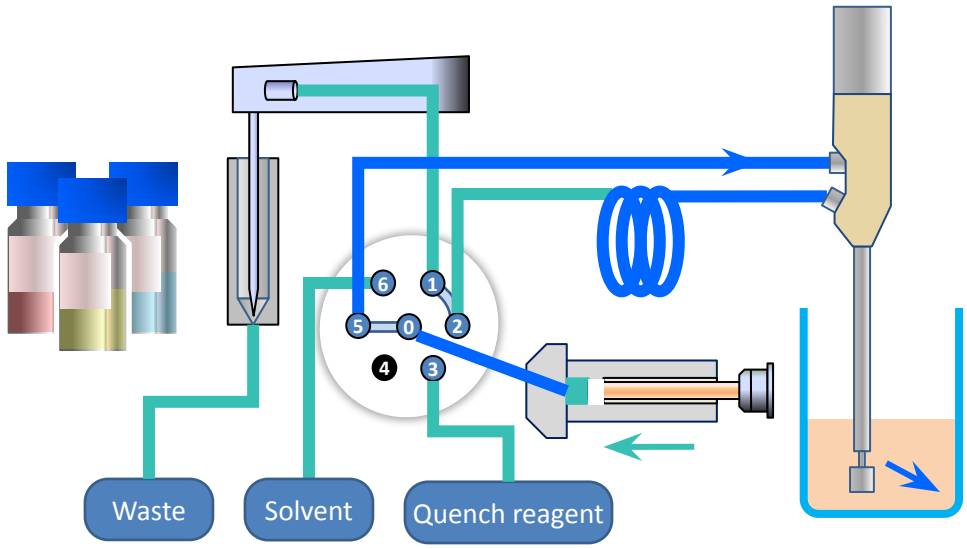
1 Refilling Syringe with Solvent

Refilling the syringe with solvent for probe cleaning. Internal volume of the probe is 770 µL, use sufficient amount to be able to replace entire probe content.



2 Cleaning the Open Probe with Half of the Solvent

Run half of the solvent volume through the probe while it is open to maximize cleaning efficiency. In this configuration, the solvent will preferentially exit through the open probe tip, flushing out residual solution along the shortest path. This approach reduces the number of washing cycles required. Ensure that the probe tip is placed in a separate waste container filled with solvent.



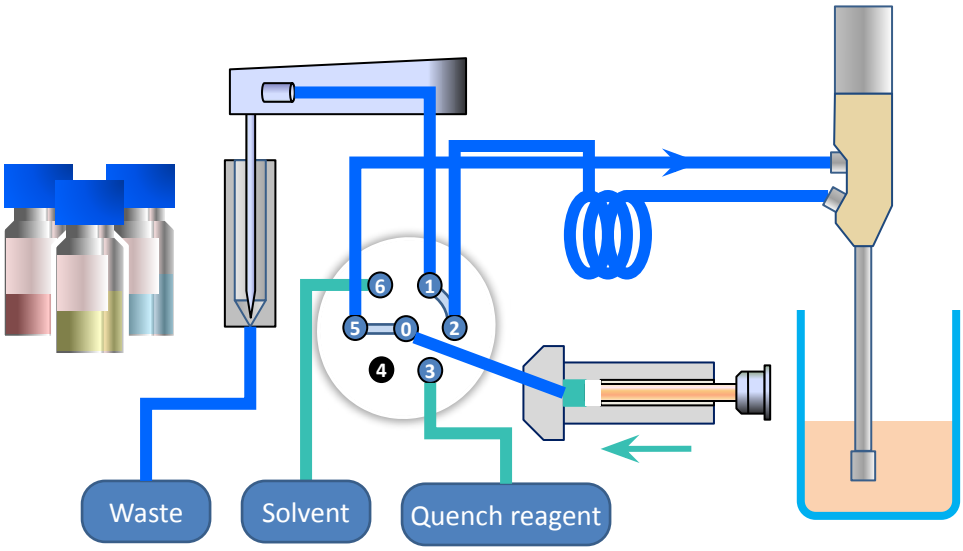
Flow Diagram: Probe Cleaning with opening

Operation:

Schematics:

3 Finishing Probe Cleaning with Remaining Solvent

Run the remaining half of the solvent volume through the closed probe to complete the cleaning process.
Avoid selecting an excessively high solvent cleaning rate for viscous liquids. However, a higher flow rate can help generate pressure to dissolve any remaining air bubbles inside the probe.



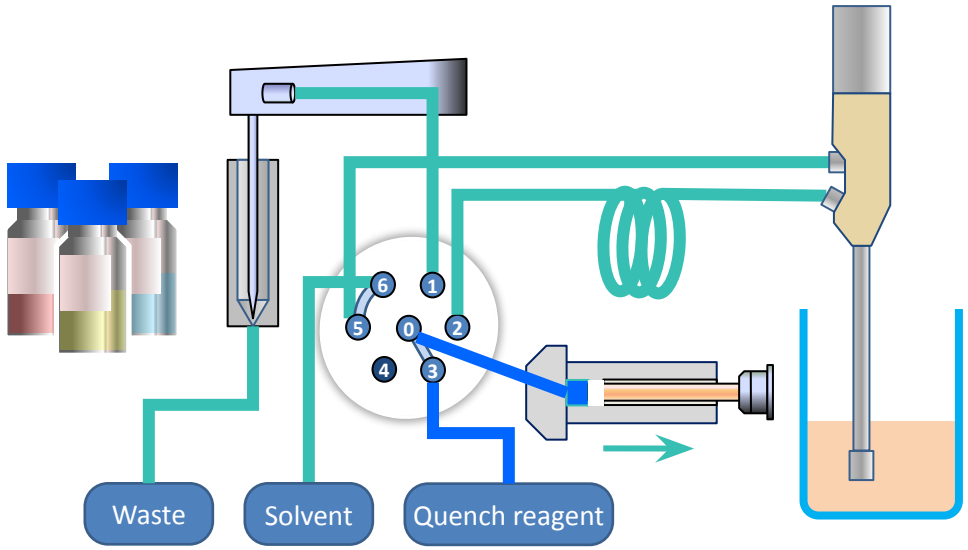
Flow Diagram: Quenching (preparing)

Operation:

1 Filling Tubes with Quench

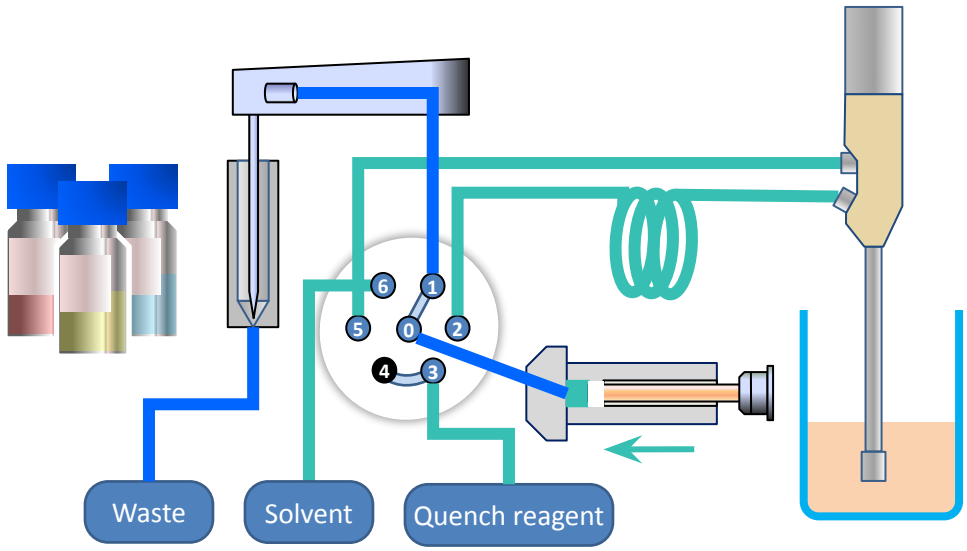
Fill the tubes with quench by drawing the reagent directly from the designated quench container into the syringe.
This is important because, during device operation, a small amount of solvent may enter the quench tube from the valve due to valve rotation — particularly when the syringe draw rate is set too high, creating excessive pressure.

Schematics:



2 Emptying Syringe to Waste

Flush the syringe to waste to remove any residual liquids previously drawn from the tubes.



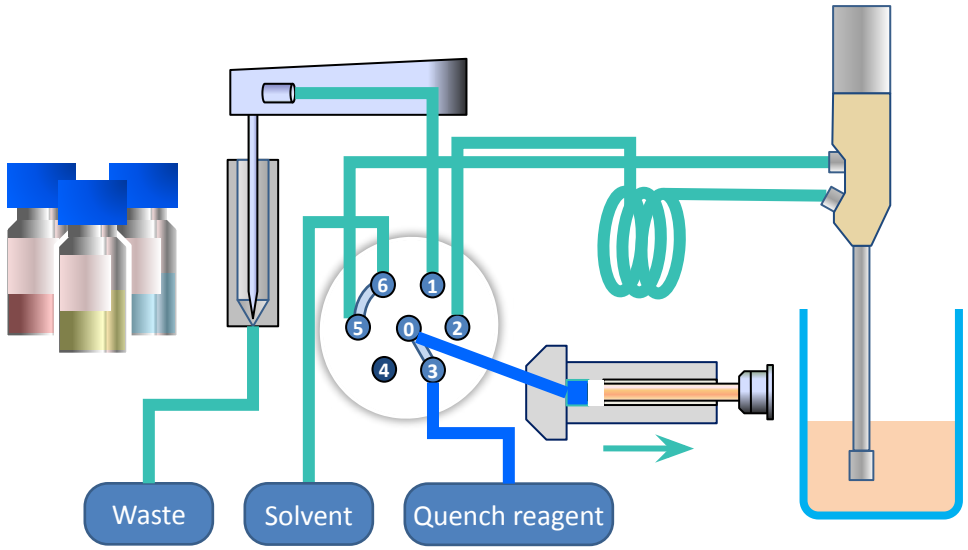
Flow Diagram: Quenching (cycle)

Operation:

3 Filling Syringe with Quench

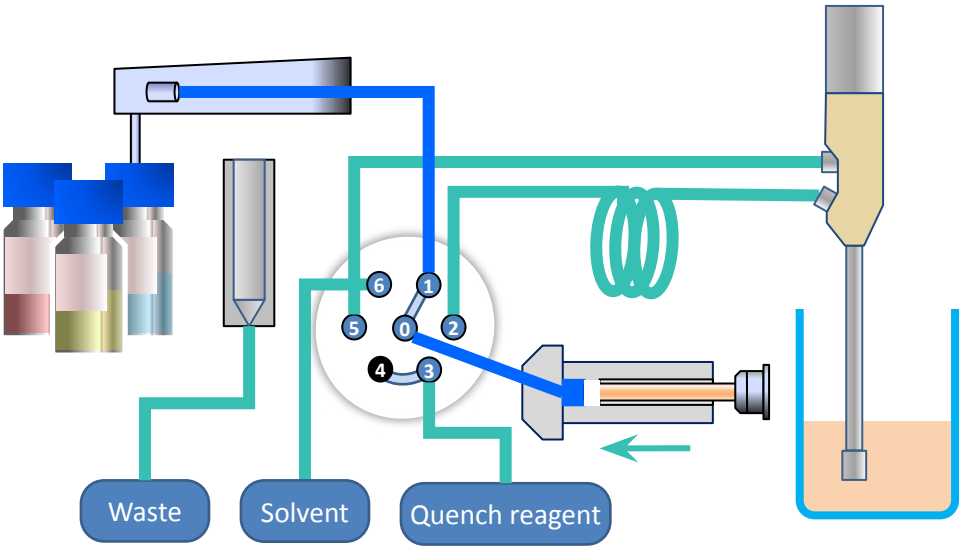
Filling the syringe with the required amount of quench, calculated as the number of vials to be filled multiplied by the quench volume per vial.
If the total required volume exceeds the syringe capacity, repeat the filling cycle as needed.

Schematics:



4 Filling Vials with Quench

Vials are filled with quench one by one. The needle is lowered into each vial, the specified volume of quench is dispensed from the syringe, and a short pause follows to allow pressure normalization before proceeding to the next vial.



Step 4 is repeated for each Vial (or steps 3 and 4)

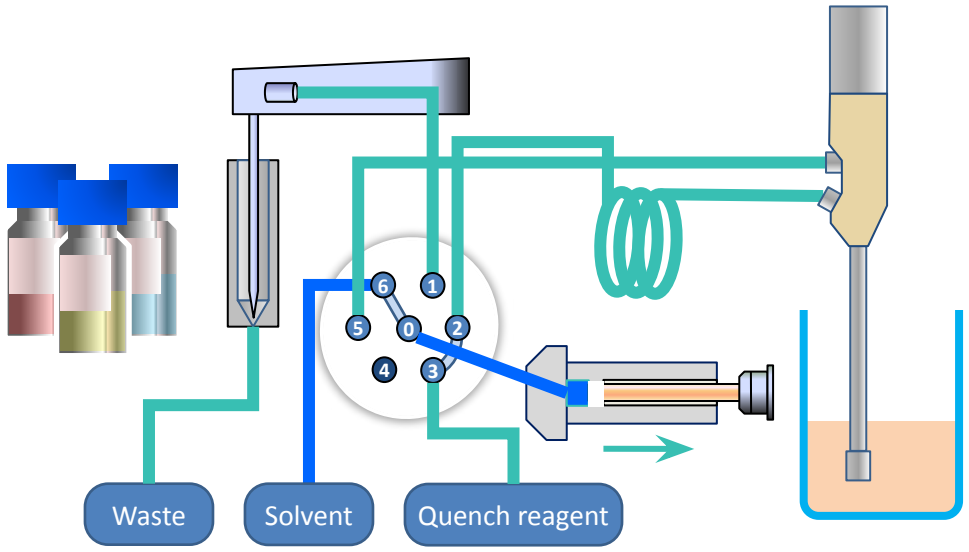
Flow Diagram: Reactor Sampling with Probe

Operation:

1 Refilling Syringe with Solvent

Refilling the syringe with a volume of solvent greater than the intended diluent volume. This solvent will later be used to dilute the sample and dispense it into a vial.
After filling, a brief pause is required to normalize pressure and improve sampling accuracy.

Schematics:

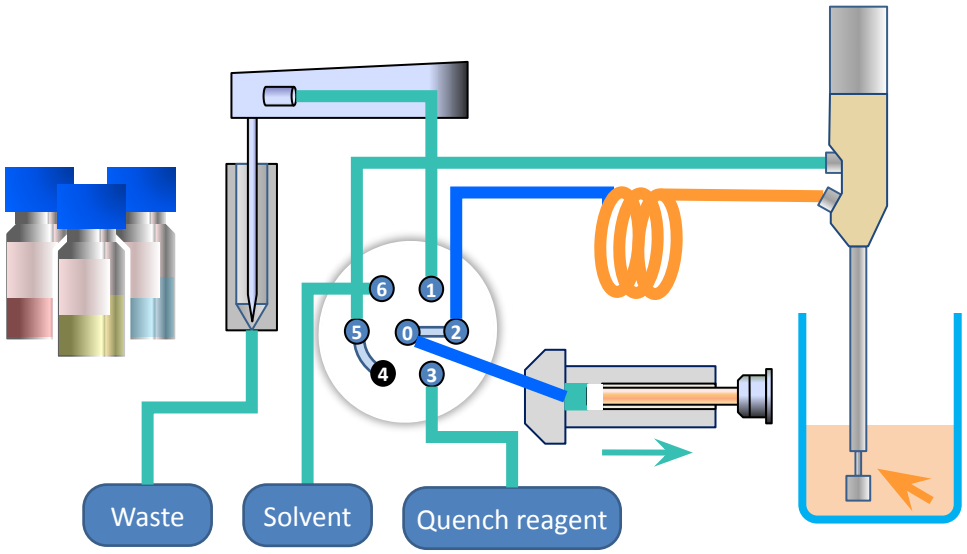


2 Sampling

This is the main step in the process. The probe opens, and the sample is drawn into the loop. To ensure accurate sampling, the **Sampling flow rate** and **Delay after sampling** (a pause following refill) should be adjusted based on the viscosity and density of both the solution and the solvent.

Proper adjustment of these parameters generally improves sampling precision.

If the **solution is less dense than the solvent**, it is recommended to use a **higher Sampling flow rate** and a **shorter Delay after sampling**.



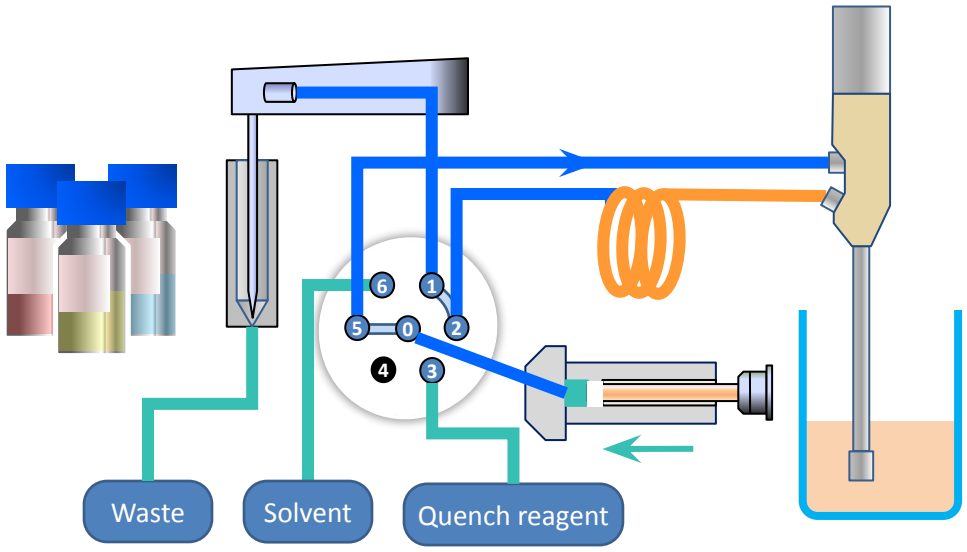
Flow Diagram: Reactor Sampling with Probe

Operation:

Schematics:

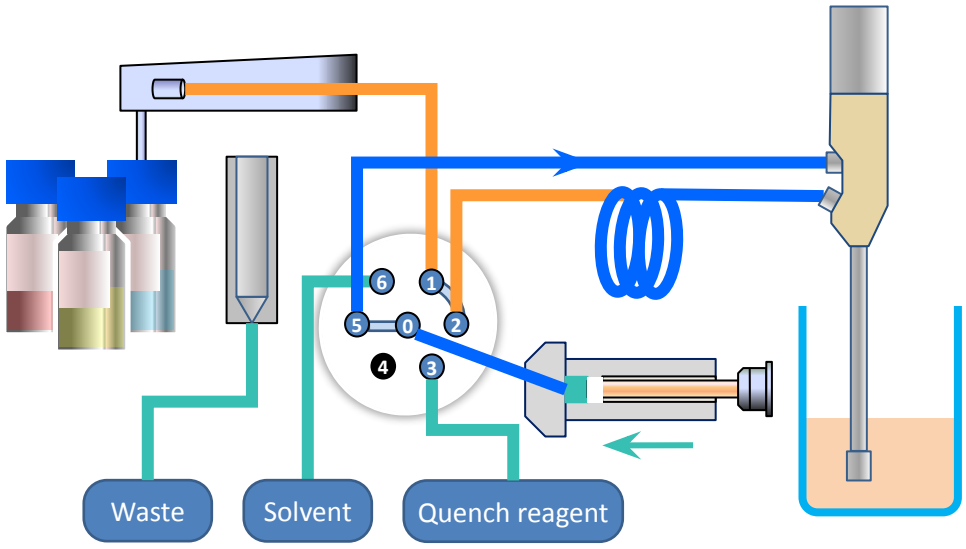
3 Drawing Excess Solvent from Tubes

Draw a small excess volume of solvent through the tubes to waste — less than the internal volume of the tubes.
This step helps move the sample closer to the needle in preparation for vial filling. As a result, the subsequent solvent used for dilution will more effectively flush the sample from the tubes directly into the vial.



4 Filling Vial with Sample and Solvent

Dispense the remaining volume (Diluent and Sample) from the loop into the vial while simultaneously lifting the needle to prevent it from being wetted by the liquid.



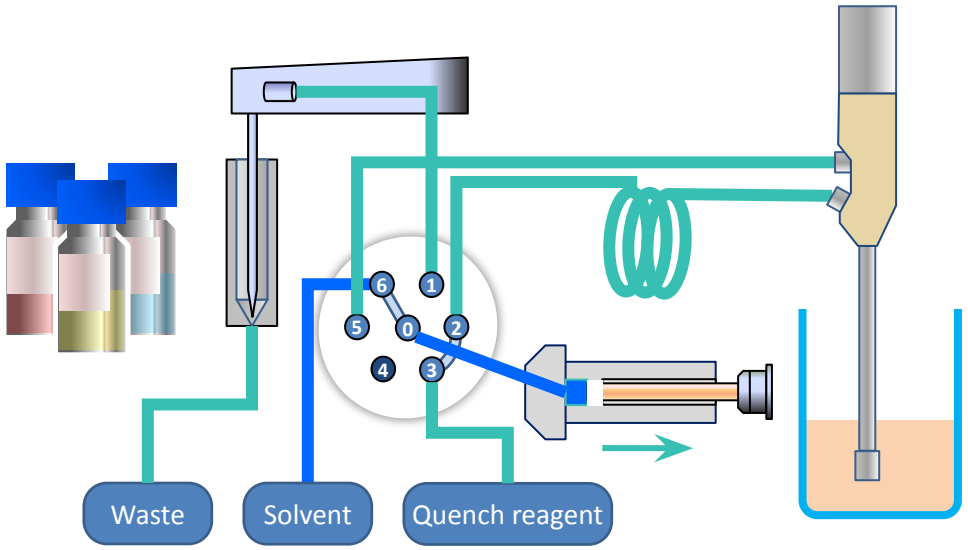
Flow Diagram: Reactor Sampling with Probe

Operation:

5 Solvent Refill

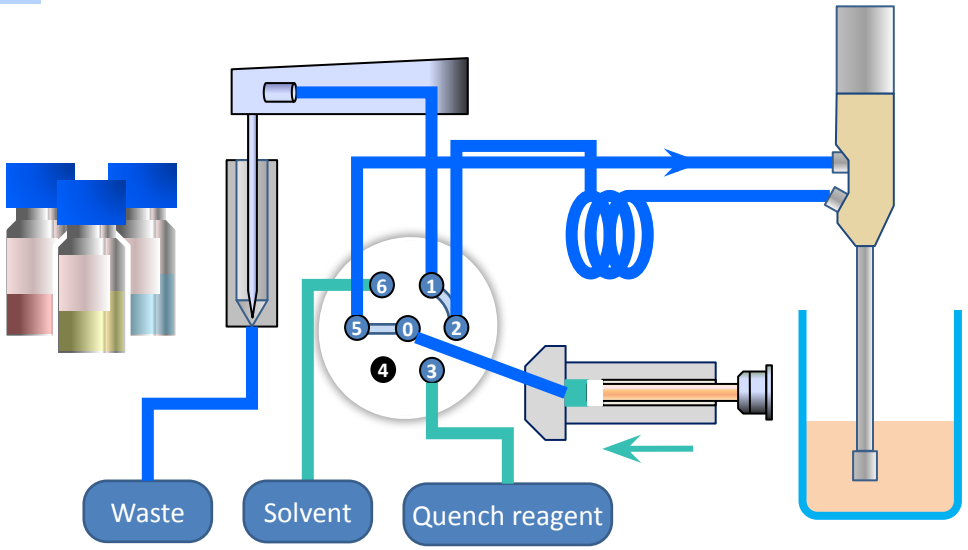
Refill the syringe with solvent for subsequent probe cleaning.
It is recommended to use a larger cleaning volume, as the internal dead volume of the probe is 770 µL.

Schematics:



6 Cleaning Probe with Solvent

Running solvent through the probe to waste to clean the internal flow path.
Avoid selecting an excessively high solvent cleaning rate, especially for viscous liquids.



Repeat this cycle to fill the desired number of vials