ECLASSICAL 3200L UHPLC

USER MANUAL

Operation Manual

for S3220L Auto-sampler

V1.0.9

Statement

The manual is intended to help users to understand, use and maintain S3220L auto-sampler. Elite Analytical Instruments Co., Ltd. does not assume the responsibility caused by business or special purpose use of the manual.

The information in this document is subject to change without notice and should not be construed as a commitment by Elite Analytical Instruments Co., Ltd..

This manual is believed to be complete and accurate at the time of publication. Elite Analytical Instruments Co., Ltd. assumes no responsibility for any errors that may appear in this document.

In no event shall Elite Analytical Instruments Co., Ltd. be liable for incidental or consequential damages in connection with, or arising form, the use of this manual.

Please read the document carefully before using S3220L auto-sampler.

Foreword

Thank you for purchasing our equipment. To ensure correct and safe use of the instrument, please read it carefully before using.

The details of the equipment's composition, installation, method of using, maintenance, parts selection and other points are described in the manual. After reading, please keep it carefully. Please delivery the manual with the instrument.

For safe operation, please read the following **Safety Precautions** before using the instrument.

Safety Precautions

According to the level of danger and harm, safety signs here are divided into the following three categories:

【Warning】 **Failure to properly follow the instructions and precautions indicated by this sign may result in serious injury or damage to health and property. The property damage includes the environment around and the instrument.**

【Caution】 **Failure to properly follow the instructions and precautions indicated by this sign may result in slight injury or damage to health and property. Slight injury means no hospitalization is needed to the wounded. Slight property damage means the instrument can be recovery through simple maintenance.**

【Note】 **The sign is used wherever information is given to ensure optimal performance of the instrument.**

1. Precaution for usage

【Warning】 **S3220L auto-sampler should only be used as a part of HPLC. Do not use it for any other purpose. Except for special instructions, this instrument does not have explosion-proof function.**

2. Ambient Conditions

【Warning】 **When we use organic solvent it is recommended that interior must be well ventilated and the firework should be prohibited. Also, a sink or equipment for washing eyes should be installed nearby in case of the organic solvent meeting the eyes or skin.**

【Note】 **In order to ensure good efficiency, keep the instrument away from caustic gas, dusty environment or strong magnetic. The worktable should be wide and strong enough. Ambient should be between 10℃ to 30℃ with a small fluctuation, and humidity should be between 20% to 80%. Avoid it from cold or hot source as well as direct sunshine. The air conditioners and other equipment should not blow directly into the instrument.**

3. Precaution for installation

【Warning】 **The instrument should be installed following the instructions strictly by professionals, make sure that the voltage of the power socket is the same as the power supply voltage indicated on the instrument. Using the wrong power voltage could result in danger and fire.**

The accessory power cable should be used to connect the pump to the power socket. Other cable should not be used.

Make sure the line cord is connected to a properly grounded power receptacle to prevent static and electric leakage.

【Caution】 **The instrument is so heavy that you should move it carefully and watch your hands in the same time.**

【Note】 **The instrument should be connected following the instructions strictly. Wrong connection could cause communication error.**

4. Precaution for use

【Warning】 **Do not use the instrument in places where heat resource, fire seat, magnetic resource, strong vibration exist or may exist. It is prohibited to put flammable nearby.**

The bottle for storing the mobile phase should have a pore in cap to prevent the danger caused by negative pressure in the bottle.

A gap between the waste tubing and the cork of the waste bottle is necessary to prevent the waste bottle bursting when it is overfilled. But the gap should be small to prevent evaporate of hazardous solvents. Even though, the waste need to be clean up promptly.

【Caution】 **When using organic solvents, please wear safety goggles, special lab coats, gloves mask etc. If your body contact with toxic solvent accidentally, wash it immediately, and then go to hospital for specialized treatment.**

【Note】 **When preparing mobile phase, please use HPLC grade solvents or equivalent ones. You'd better filtrate the eluent with a membrane filter (0.45μm), and a online filter is also necessary to prevent small particles from scratching plunger rod, seal ring or blocking tubing. What's more, please degas all mobile phase before using, degassing is an effective method to prevent chromatogram noise and wrong indicator.**

Before first use, rinse the entire piping system according to the requirements of the manual. Direct use is likely to block tubing.

Before sample test, ensure that the tubing in the system is filled with mobile phase without any bubbles, otherwise it will affect the reliability of test results.

If an eluent is replaced with another eluent which is insoluble, such as positive mobile phase (hexane) and reverse phase (methanol), be sure to operate according to the specified method in the manual, otherwise it will cause serious tubing jam, and even system paralysis.

Halogen irons is harmful for stainless steel, if there is stainless steel tubing and fitting in your system, please avoid the use of a mobile phase containing halogen ions. If you can't avoid it, please minimize the content and clean the system with water as soon as finishing the analysis.

If there is peek tubing in your system, it is important to note that:

Do not use the following solvent: concentrated sulfuric acid, nitric acid, dichloroacetic acid, dichloromethane, trichloromethane, chloroform, dimethyl sulfoxide, acetone, tetrahydrofuran, etc. Such solvents can reduce the strength of the PEEK material, make it’s become fragile and broken. But the impact of short-term use of aqueous solution of acetone (lower than 0.5%) in gradient performance is acceptable.

When using PEEK tubing, the pressure of the system should be lower than the tolerance pressure of peek material, otherwise it may burst.

The bending radius of peek tubing should be more than 10mm, make the peek tubing natural relaxation during installation.

The PEEK tubing should be intercepted with professional tubing cutter in order to make the tubing more smooth. Pay attention to that there should be no cutting debris left in the tubing.

5. Repair, maintenance and parts replacement

【Warning】 Before repair, maintenance and parts replacement, please turn off the power in case of leakage and electric shock.

There is no need to open the host cover while daily maintenance and repair. If the repair needs to open the host cover please entrust agents or communicate with us.

You should clean the dust on the power cord plug regularly to reduce the electrostatic. Then, dry it before using, otherwise electric shock may occur.

Use dry cloth to wipe the instrument. Do not use thinner or alcohol to avoid erasing characters or color on the panel.

Do not replace components (e.g. fuses, deuterium lamp, etc.) from other company or other type, all accessories are required to be specified to prevent danger.

6. Precaution for static electricity

【Warning】 As the instrument may use a lot of flammable, explosive organic reagents which may contaminate laboratory air, when the reagent concentration is too high, any spark or flame could cause fire or explosion accidents. Do not use the pump near any fire resource or hot resource, and keep reducing the electrostatic in mind.

To reduce static electricity, please take the following measures:

1） Make the instrument grounded. It is very important, please pay attention to it.

2） Maintain proper indoor humidity (humidity is greater than 65% can prevent static electricity effectively) and keep the environment clean.

3） Metal waste bottles (external conductive) should be grounded (no ground insulation). When using other materials container, you can insert one end of the wire into liquid in the bottle and make the other end earthed.

4） Replace a larger I.D. tubing when the flow of mobile phase is higher than usual.

5） Wipe the instrument regularly.

6） Staffs should wear anti-static clothing. An anti-static pad is needed on the floor.

7） People and objects with static electricity is prohibited to touch the instruments.

7. Warning label instructions

To ensure the safety of staffs, we attach warning labels on the equipment where are dangerous. If the label is missing, please request new ones from our company, and attach to the correct position.

Contents

Chapter 1 Introduction

1.1 Overview

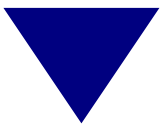
EClassical S3220L auto-samplers（S3220L for short）is one of the EClassical 3200L series products from Elite Analytical Instruments Co., Ltd.. The S3220 L auto-sampler is driven by a high-precision stepper motor, which features easy operation, high accuracy, automatic control, and remote monitoring. It can work continuously under non-manual monitoring, reducing human error and improving work efficiency. Compared with the traditional auto-samplers, S3220L has the functions of automatic dilution and derivation, and can automatically complete the whole process of dilution, derivation and injection without supervision. The injection speed is fast, and the time cost is better reduced. The inner and outer walls of the injection probe were cleaned, and the sample residue was almost zero.

As an derivative and injection units for the EClassical 3200L high performance liquid chromatograph, the S3220L auto-sampler can be easily used with other liquid chromatograph detectors, high pressure infusion pumps, column ovens and other units. It can also be used with other instruments through the S3220L Auto-sampler Control Module.

1.2 Features

Superior design

- The working mode of simultaneous movement of the tray and the sample needle optimizes the pipeline connection, shortens the injection cycle, and is compatible with 72-well、96-well、120-well、210-well and double 96 hole trays.
- The imported high-precision side-opening sample needle adopts high-purity special steel,, which improves the needle strength, reduces the adsorption, and avoids the problem that the traditional sample needle is easily blocked by the septum debris.
- High-precision stepper motor combined with world-class guide rails improves the positioning accuracy of the system and makes the position accuracy close to “zero deviation”.



- Highly integrated 32-bit STM32 embedded microcontroller and the current popular SPI and I2C bus technology, which reduces the size of the board and the number of devices used, and improves reliability.
- By adjusting the speed of the motor and the interval of the sampling steps, the sampling cycle can be shortened. The internal motor and all sensors use high flexible cables to improve the reliability of the whole machine.
- Ultra-fast sampling function, effectively improving the experimental efficiency.

Intelligent system

- Fully automatic power-on self-test function and preparation function, the circuit and mechanical fault of the auto-sampler can be found in the first time, and the system is completely exhausted to achieve good experimental repeatability.
- The lighting adopts software control to realize the personalization of control.
- Dual probes make leak alarms more accurate.

Diversified functions

- Three different injection modes are available for users to select, and the appropriate mode can be selected according to the specific experimental requirements, so as to obtain the best analysis results.
- The internal and external walls of the sample needle are cleaned so that the sample residue is zero.

1.3 Performance specification

Table 1-1 Performance Specification for S3220L

No.	Items	Specifications
1	Injection range	0.1-100 μL（ES3220L） 0.1-20 μL（ES3221L、ES3222L）
2	Injection repeatability	RSD ＜ 0.2% Full sample loop injection (standard conditions) RSD＜0.5% Partial volume injection lossy injection (standard conditions) RSD＜1.0% Partial volume injection without loss (standard conditions)
3	Injection linearity	r^2＞0.999
4	Sample residue	＜0.005%
5	Highest pressure	45MPa (standard)、102mpa (optional)、120MPa (optional)
6	communication method	TCP
7	Injection trigger	Digital mode、Analog mode
8	Cleaning method	The inner wall and outer wall of injection needle were cleaned
9	Cleaning solvent selection	Support strong and weak cleaning solvent selection
10	Leakage alarm	Leakage sensors with safety features, dual leakage sensors

1.4 Physical Specifications

Table 1-2 Physical Specification for

No.	Items	Specifications
1	Weight	16 kg
2	Size (length × width × height)	600 mm×380 mm×180 mm
3	Power supply	AC 220 V±10%,50 Hz
4	Power	80VA

1.5 Principle

The S3220L auto-sampler uses a working mode in which the tray and the sample needle move at the same time, and is combined with a two-position six-way valve for injection. The basic structure principle is shown in Fig 1-1.

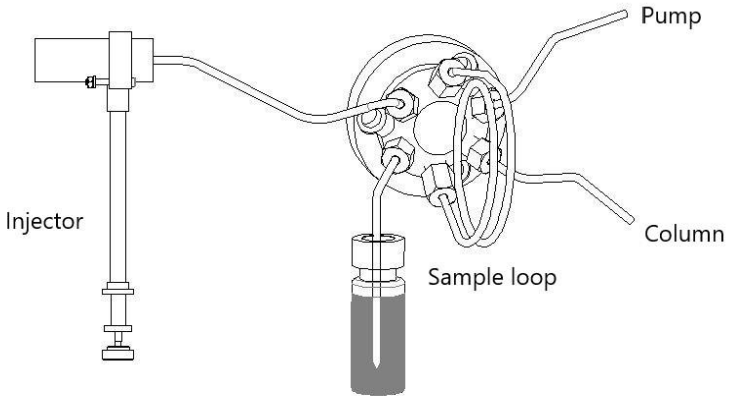


Fig 1-1 Structural schematic

The S3220L uses the basic principle of suction injection. The sample is quantitatively sucked into the sample loop through a syringe connected to the sample needle, and the injection valve is switched to achieve the purpose of injection. The S3220L is divided into three injection modes: full sample loop injection, partial volume injection (with sample loss), partial volume injection (no sample loss), and the specific principle is shown in Fig 1-2~1-4 is shown.

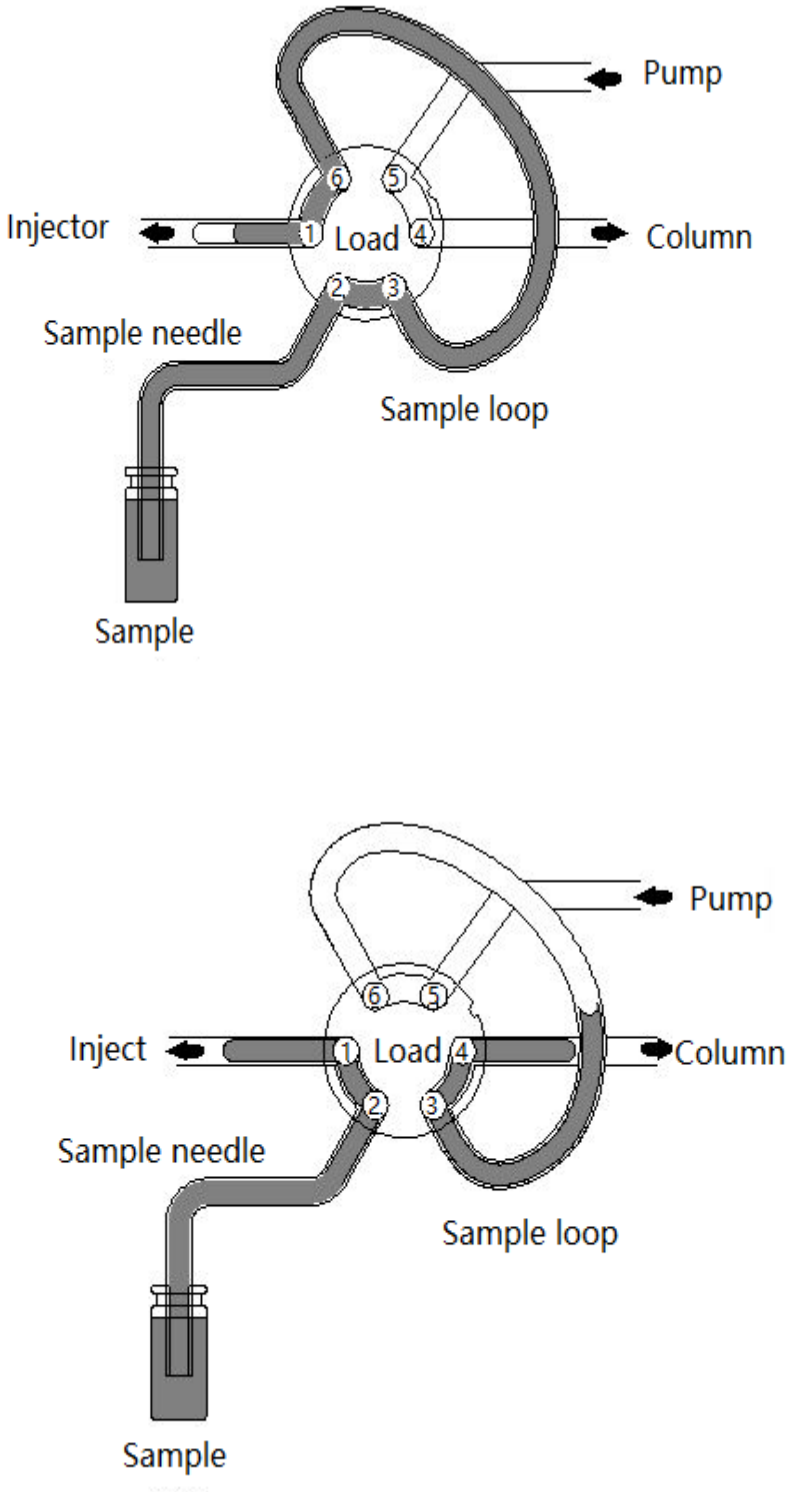
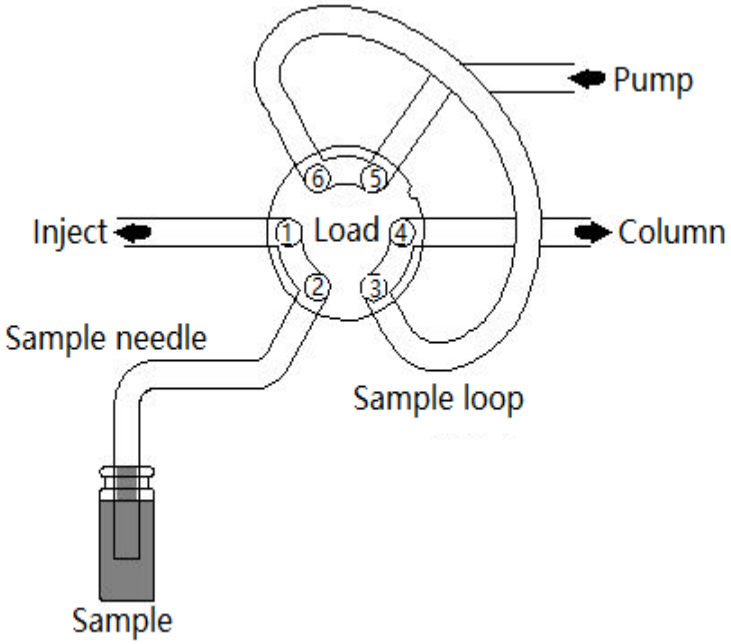
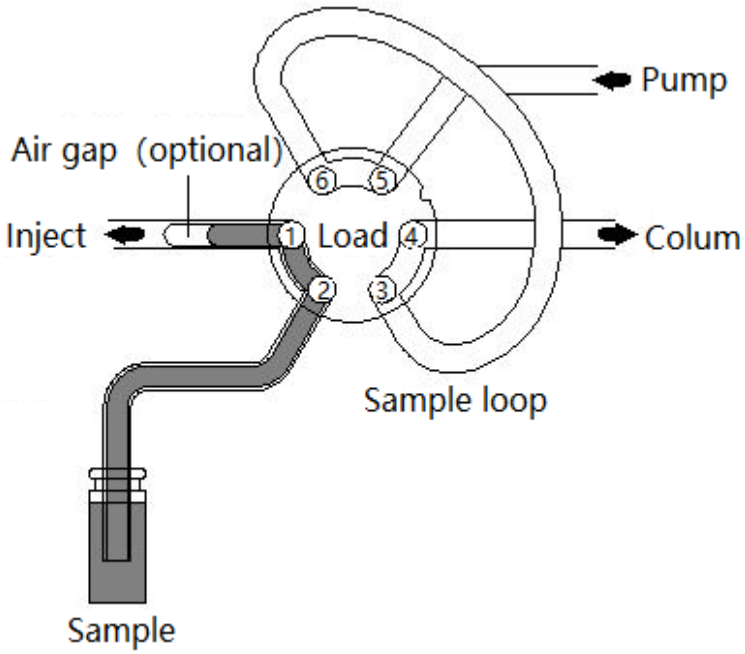


Fig 1-2 Full sample loop injection


Pump
6
5
Inject
1
Load
4
Column
2
3
Sample needle
Sample loop
Sample


Pump
Air gap (optional)
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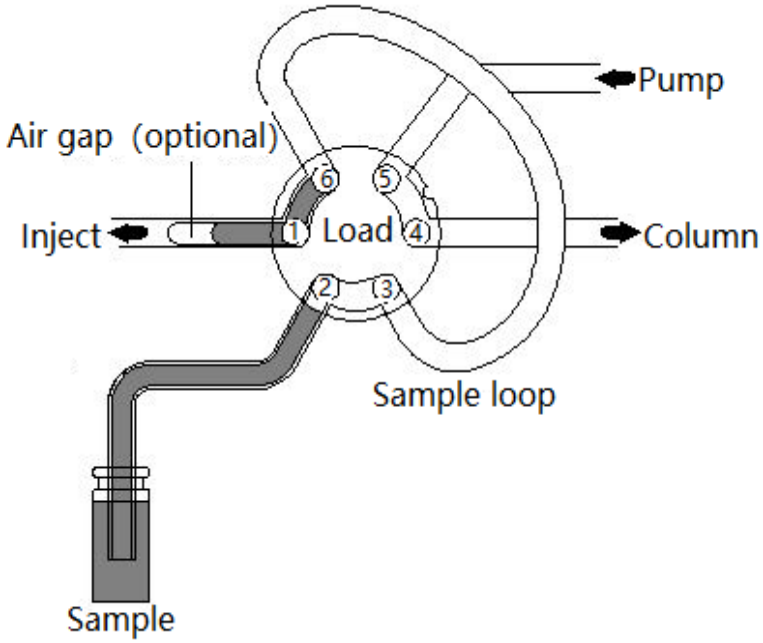
Inject
1
Load
4
Colum
2
3
Sample loop
Sample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Air gap (optional)
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Inject
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Load
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Column
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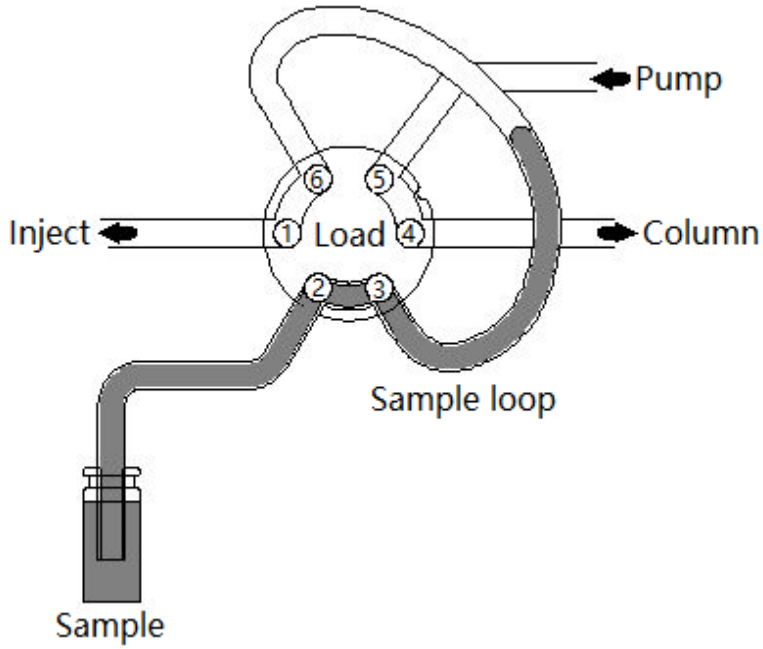
3
Sample loop
Sample


Pump
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Sample loop
Sample

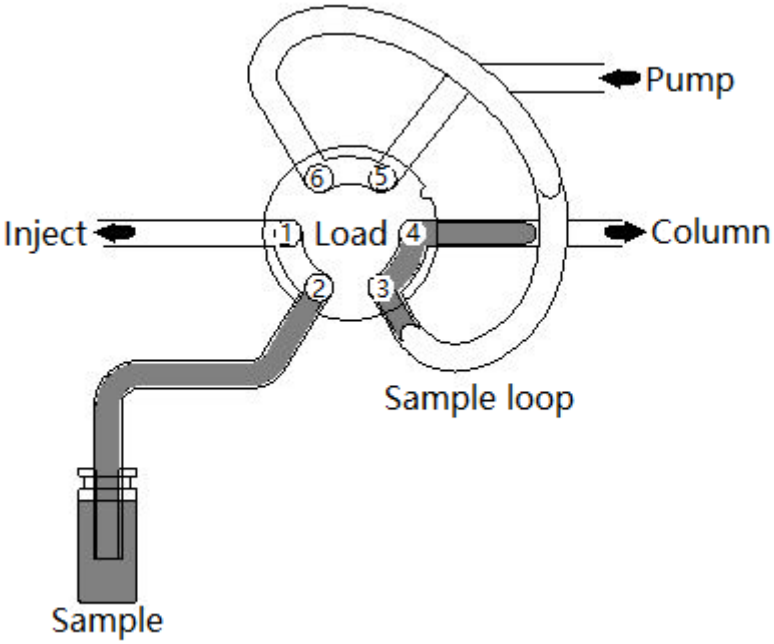
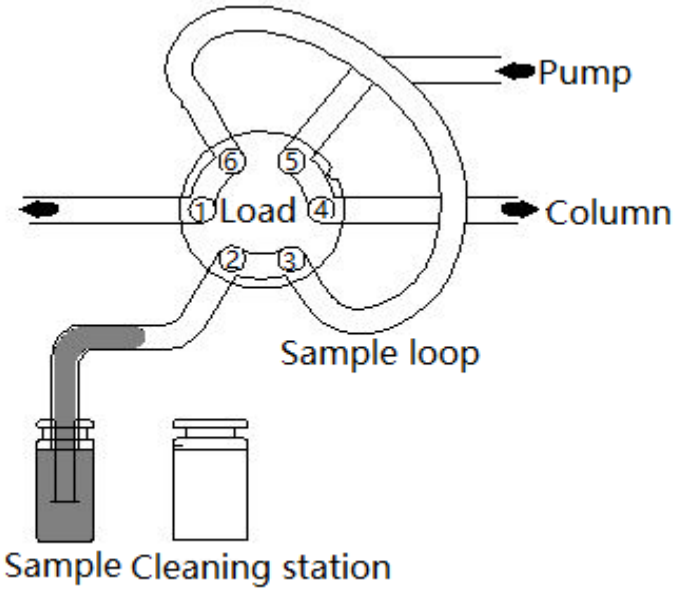


Fig 1-3 Partial volume injection (with sample loss)



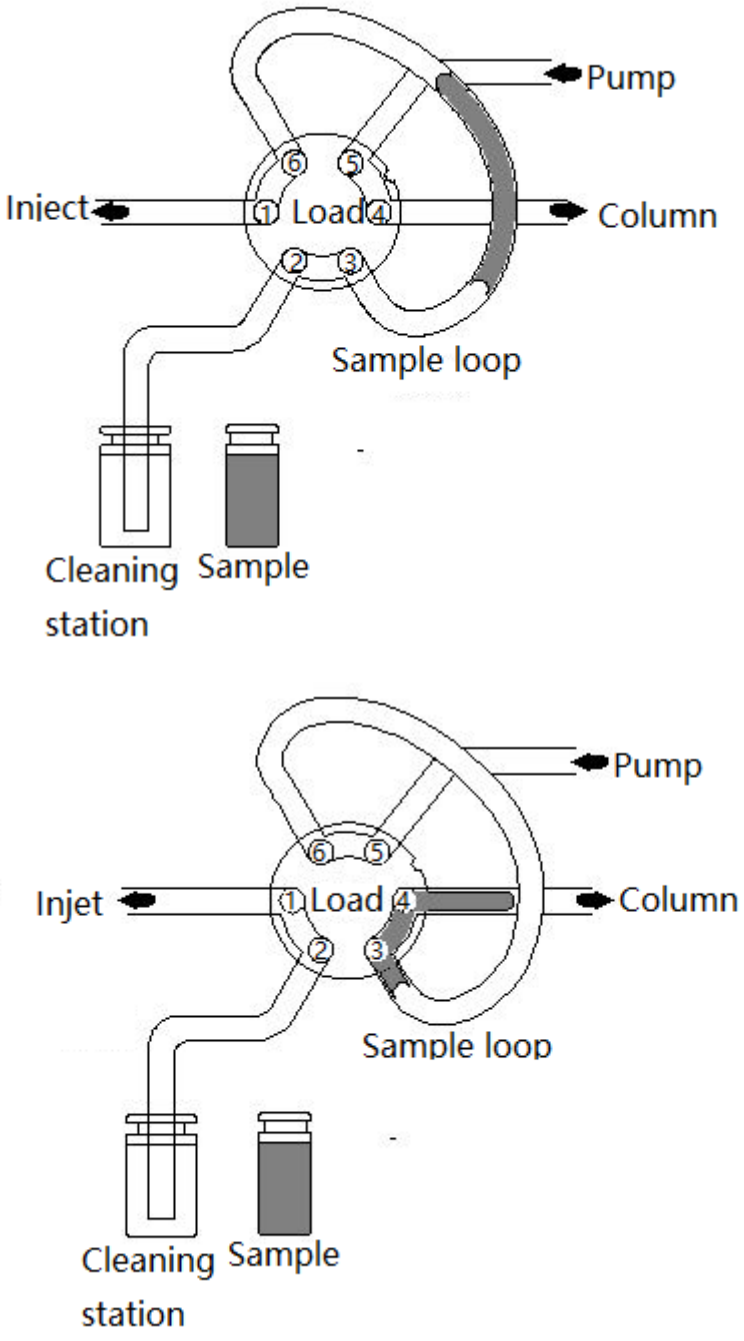


Fig 1-4 Partial volume injection (no sample loss)

1.6 Appearance

The appearance of the instrument of the S3220L auto-sampler is shown in Fig 1-5.

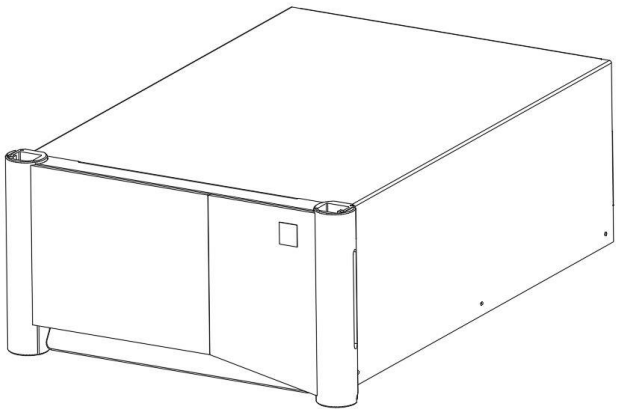


Fig 1-5 S3220L auto-sampler

1.7 Structure

1.7.1 front panel schematic

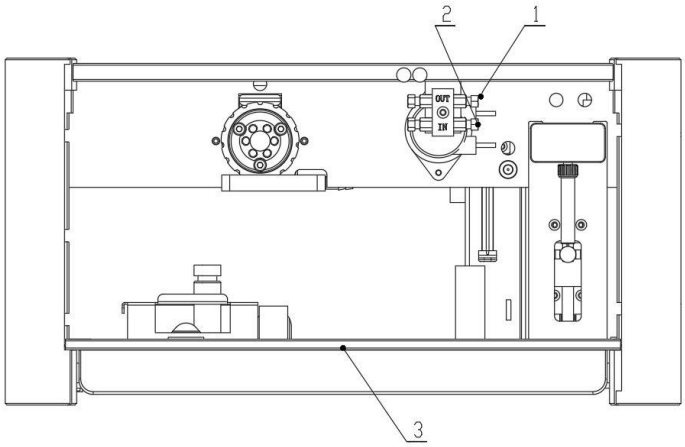


Fig 1-6 S3220L auto-sampler front liner schematic

Table 1-3 Main components of the S3220L auto-sampler front liner

No.	Items	Specifications
1	Outlet	Interface connected to the column by the auto-sampler
2	Inlet	Interface connected to the auto-sampler by the pump
3	Indicator light	Used to display the auto-sampler status

1.7.2 rear panel schematic

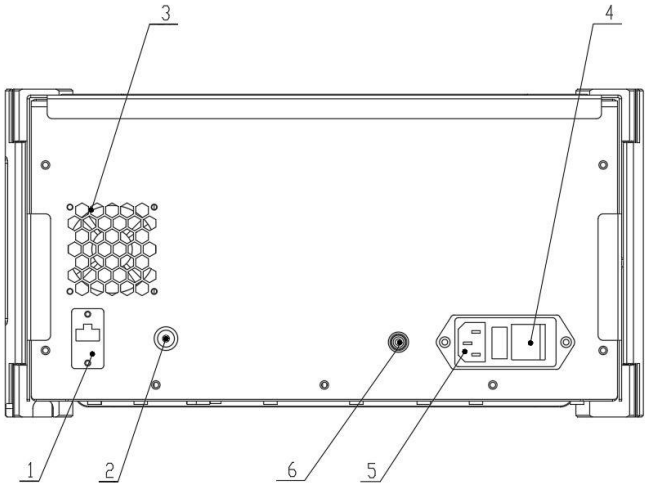


Fig 1-7 S3220L auto-sampler rear panel schematic
1. LAN Cable interface;2. Trigger interface;3. Exhaust fan fuse;4. Switch;
5. Power socket;6. Grounding bolt;

Chapter 2 Installation and transport

2.1 Unpacking inspection

S3220L auto-sampler is packaged with corrugated boxes and foam lined structure, as you receive the instrument, check the packaging first, if you found packaging is damaged, please contact with Elite Analytical Instruments Co., Ltd. or local dealer.

【Warning】 **If there is any damage to the instruments when you receive it, please don't try to install it. You can ask Elite Analytical Instruments Co., Ltd. to inspect and assess it**

2.1.1 Demolition of the packing

Place the wooden box with the S3220L auto-sampler face up on a level surface. Use pliers to straighten the wooden box and remove the top cover of the wooden box. Use scissors or a blades to cut the top tape of the carton, take out the auto-sampler and accessories, and place them on the table， open the instrument packaging film.

【Warning】 **It is suggested that installation operation should be careful to prevent instrument slide or damage to health**

2.1.2 Deliver checklist

Table 2-1 Deliver list of S3220L auto-sampler

NO.	Items	Quantity
1	S3220L auto-sampler	1 pc.
2	Certificate	1 pc.
3	Service Card	1 pc.
4	Start Package	1 pc.

【Note】 **If there are discrepancies between the packing list in the box and in the specification, please refer to the packing list in the box. It is subject to change without prior notice**

2.2 Stack Order

In order to guarantee the best working state of the instrument, it is recommended that the instruments should be stacked as shown in Fig 2-1.

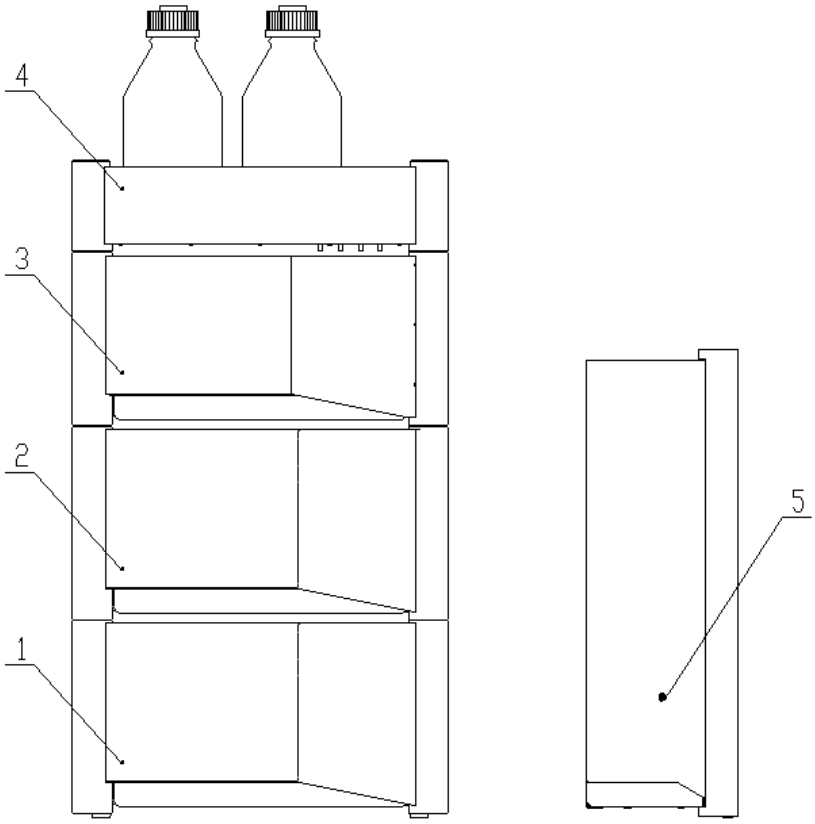


Fig 2-1 Schematic diagram of stacking sequence of EClassical 3200 high performance liquid chromatograph
1. High-pressure constant flow pump;2. Auto-sampler;3. Detector ;
4. Solvent bottle tray;5. Column oven;

2.3 Installation Requirements

2.3.1Site Requirements

- ***Environment***

S3220L auto-sampler need to work under ambient conditions in table 2-2 below. It is recommended that the ambient temperature change less than 2°C/h. If the ambient temperature fluctuates significantly, the sample volume may change slightly.

Table 2-2: Environment requirements

Items	Specifications	Requirements
1	Work environment	Room should be free of dust, inflammable and explosive materials, also, good ventilation is important
2	Electromagnetic field	No electromagnetic noise nearby
3	Operating temperature	10~40℃(50~104℉)
4	Humidity	20%~80%，non-condensing

【Caution】 **Do not use the column oven under conditions of temperature fluctuations. If the ambient temperature is too low, make the room temperature increase slowly to avoid condensation inside caused by rapid heating**

- ***Bench space***

S3220L are allowed to place on almost any laboratory bench. If you want to display the EClassical 3200L on the bench, make sure that the table can bear the weight of all components. It needs an additional 100 mm on the left,50 mm on the right,150mm on the back to facilitate the circulation of air, electrical connections.

【Warning】 **The instruments should be placed on a horizontal position, otherwise there is a danger of falling**

2.3.2 power line

To ensure that the instrument can be normal and safe, please use a dedicated power line within the specified voltage range.

- Grounding, AC power to 220V ±10%, 50 Hz;.
- Please use T2AL250V fuse

【Warning】 **The accessory power cable should be used to connect the auto-sampler with the power socket. Other cable should not be used in case of danger or damage to the instrument. If the instrument is connected to a grid above the scope of application, it may cause electrical shock or damage to the equipment and staff.Please unplug the power cord before replacing the fuse to avoid electric shock. For the safety of the person and the protection of the instrument, an external fuse is installed at the rear of the instrument**

2.4 Communication connection

EClassical 3200L high performance liquid chromatograph uses P3220L pump to manage and control the communication of each unit component. Refer to Fig 2-2 for the schematic diagram of the communication line connection.

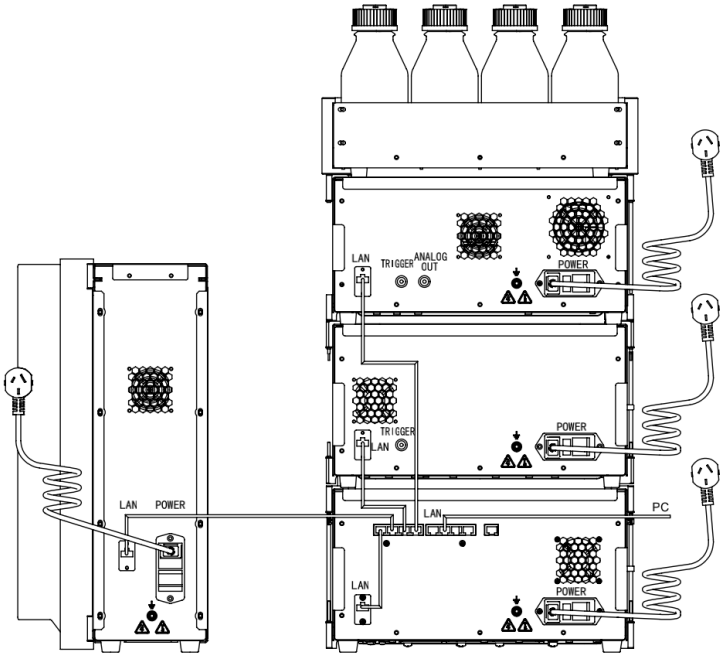


Fig 2-2 EClassical 3200L circuit and communication connection

2.4.1 Circuit connection

EClassical P3200L series of high pressure constant pump constant follow these steps:

1） Place the pump in the HPLC system according to the stack order.

2） Make sure the power switch on the rear panel of the pump is OFF.

3）Connect the pump to the power supply.

【Caution】 **The power switch is off, and the instrument is still live. To disconnect the power completely, please unplug the power cord on the rear panel of the instrument!**

2.4.2 Communication connection

S3220L auto sampler communication connection, please follow the steps below：

1) Confirm that the pump power switch is in the OFF state.

2) Connect the computer network port and the pump switch network port with a network cable.

3) Connect the network port of the pump switch and the network port of the auto sampler with a network cable.

【Warning】 **The pump switch network port adopts a parallel structure, with a total of 8 yellow network ports, and each device is connected to the corresponding numbered network port position of the pump according to the number on the rear panel. Please use the dedicated communication line provided by our company. If you use another brand or unknown communication line, it may cause the instrument to fail to communicate or to interrupt the communication. If there is no P3220 pump, you can use a router instead.**

2.4.3 Synchronous trigger interface connection

Connect the synchronization interface to the trigger connection terminal on the rear panel of the auto sampler, and connect the synchronization interface to the detector trigger line for communication connection.

2.5 Pipeline and flow path connection

EClassical 3200L high performance liquid chromatograph pipe and flow path connection as shown in Fig 2-3.

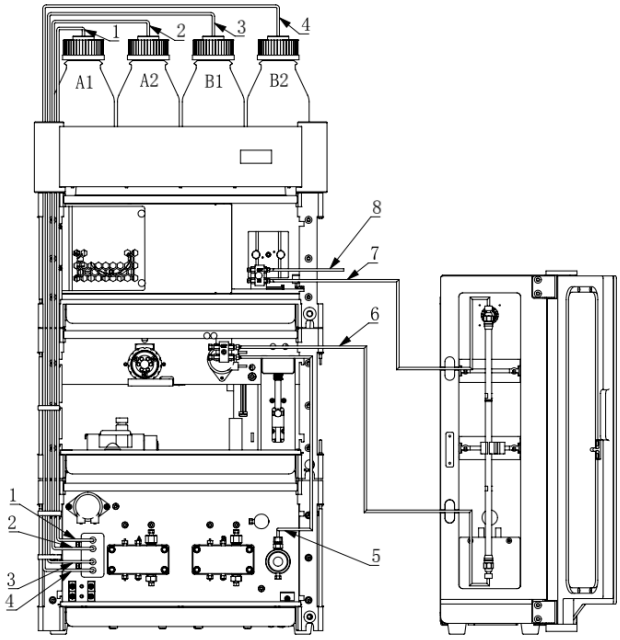


Fig 2-3 EClassical3200 high performance liquid chromatograph recommended configuration total flow diagram

2.5.1 Pipeline connection

- ***Cut tube***

Please use the special pipe cutter provided by the manufacturer to cut the pipe to a suitable length. The cutting surface should be flush, and then bend back and forth until the pipe is cut.

【Caution】 **Make the cut surface of the tube as flat as possible to avoid dead volume. In addition, avoid deformation of the inner diameter of the tube, causing the tube to be blocked.**

- ***Connect the blade ring***

The correct way of connecting screws and stainless steel blade rings for stainless steel pipes as shown in Fig 2-4 and Fig 2-5.

【Caution】 **Please use matching screws and blade rings. Stainless steel corresponds to stainless steel, and PEEK corresponds to PEEK .**

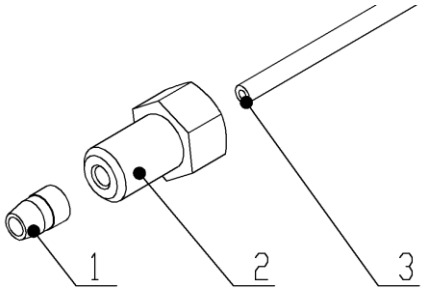


Fig 2-4 Connection diagram
1.SS Ferrule;2.SS Nut;3. SS Tubing;

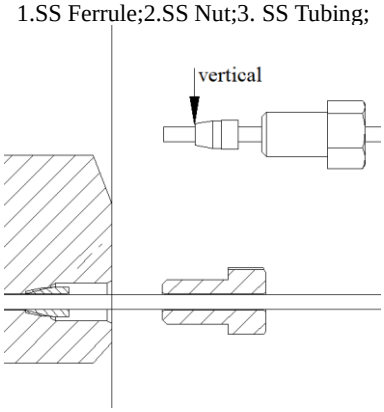


Fig 2-5 Seal ring and tube

【Caution】 **Insert the pipe and touch it to the bottom end of the opening so that there is no dead volume. The strength is subject to no leakage, otherwise the screw will be damaged.**

2.5.2 Flow connection

For the flow path connection of the complete set of EClassical 3200L high performance liquid chromatograph, please follow the steps below：

1）Solvent filter cup assembly and infusion line connection

Connect in order according to the label on the figure.

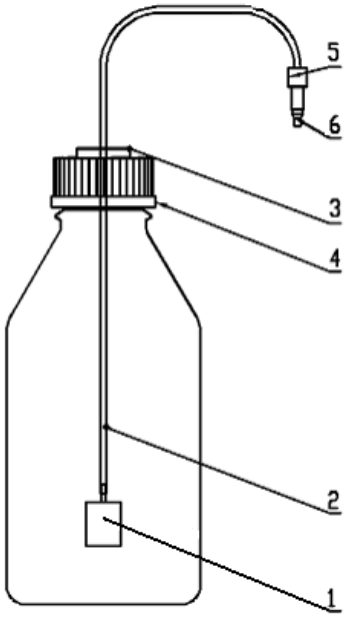


Fig 2-6 Solvent filter cup assembly and infusion pipeline connection

1. Solvent filtration;2. Infusion tube;3. PTFE plug;4. Bottle cap;5.1-8 Solenoid valve connecting screw;6.Omni-Lok;

2）Connect the liquid storage bottle to the inlet of the pump head

Connect the FEP infusion tube and solvent filter cup assembly provided with the instrument to the pump inlet according to Fig 2-7.

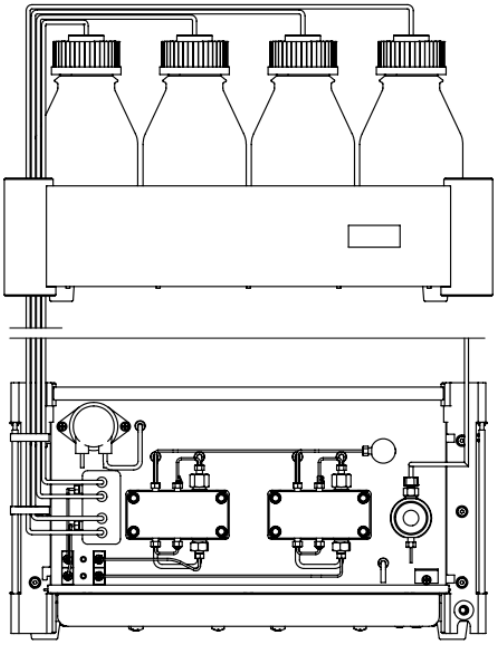


Fig 2-7 Connection diagram

【Note】 **The filter head of the solvent filter bowl assembly needs to be cleaned frequently to prevent contamination。**

To obtain stable analysis results, the mobile phase in the liquid storage bottle must be degassed

The mobile phase must be filtered through a filter membrane with a pore size not greater than 0.45μm.

3）Connection between pump outlet and auto sampler

- **Connection between pump outlet and manual injection valve**

Connect the outlet of P3200 and the inlet of the injection valve with a stainless steel tube (with connecting screw and sealing blade ring). Usually the No. 2 hole of the Rheodyne injection valve is the inlet (also the inlet of the injection valve), and the No. 3 is the outlet. The connection method is as follows Fig 2-8.

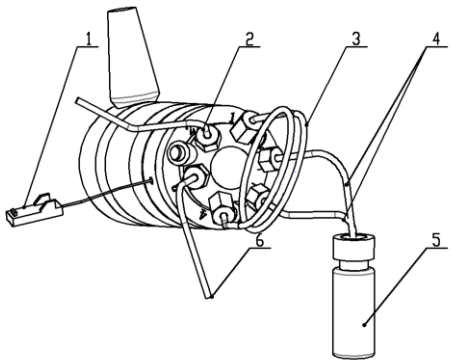


Fig 2-8 Manual injection valve connection in the flow path
1. Automatic trigger interface;2. Mobile phase inlet;3. Sample loop;4. Waste pipe;
5. Waste bottle;6. Mobile phase outlet;

- **Connection between pump outlet and auto sampler**

Install the mobile phase capillary (stainless steel or PEEK pipe，standard configuration is 1/32" stainless steel tube) on the inlet of the auto-sampler with the standard screws and blades, and connect the other end of the pipe to the pump (gradient system is connected to the mixer). Connect as shown in Fig 2-9.

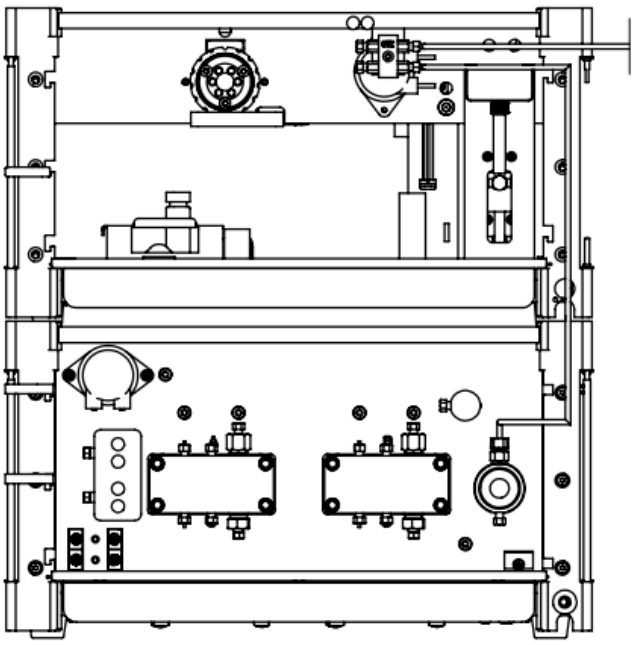


Fig 2-9 Connection between pump outlet and auto sampler

4）Connection between injector and chromatographic column

The tubing (stainless steel tube or PEEK tube, standard 1/32" stainless steel tube) should be connected to the outlet of the injector, and then connected to the chromatographic column. The connection method is shown in Fig 2-10.

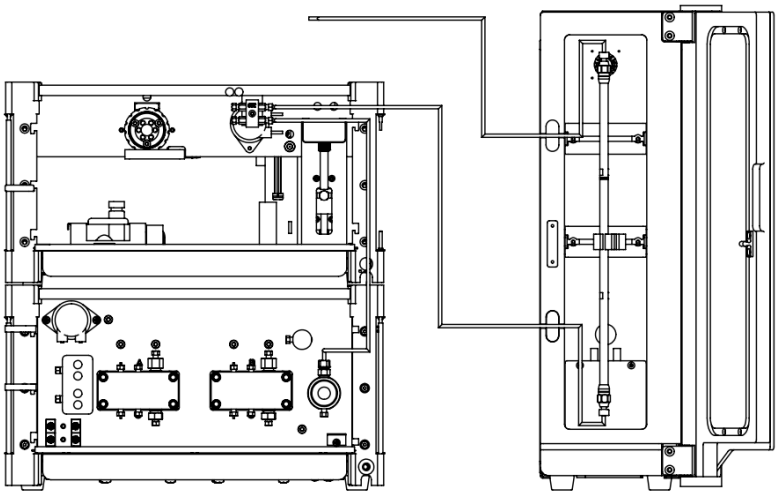


Fig 2-10 Connection of injector and chromatographic column

5）Connection between chromatographic column and detector

The connection between the chromatographic column and the detector is shown in Fig 2-11. The outlet of the chromatographic column is connected to the inlet of the detector. The entrance and exit of the detector are bottom in and top out.

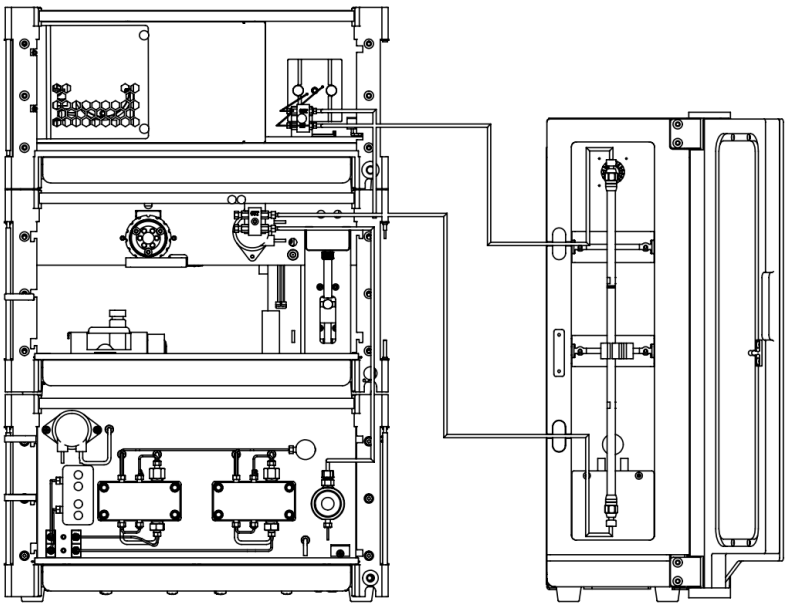


Fig 2-11 Connection between chromatographic column and detector

6）Connection of plunger cleaning pipeline

The silicone tube coming out of the liquid storage bottle containing the cleaning solution is connected to the inlet of the peristaltic pump, and the outlet of the peristaltic pump is directly inserted into the Y-shaped interface reserved on the main pipe of the waste liquid of the system, as shown in Fig 2-12.

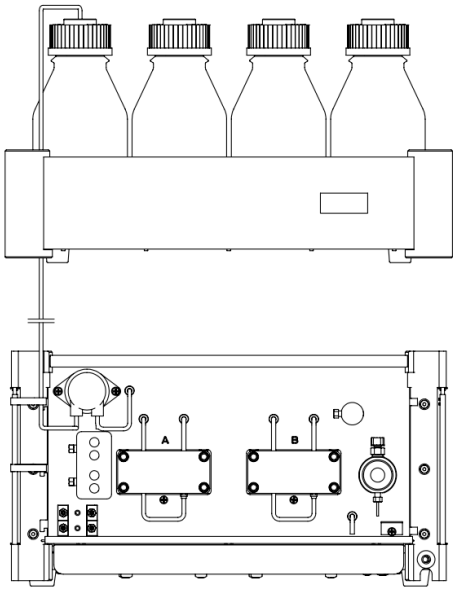


Fig 2-12 Schematic diagram of the connection of plunger cleaning pipeline

【Note】 **The installation position of the waste liquid bottle should generally be placed no higher than the position of the instrument.**

7）Connection of pipelines at multi-channel body

The multi-channel body is the collection place of the system waste liquid, in which the mobile phase waste liquid, the cleaning and discharge waste liquid, the discharge pipe discharge liquid, and the accidental pump leakage discharge liquid are all collected in the multi-channel body. This place is connected with the accidental waste discharge pipeline of the chromatographic column thermostat by the Y tee, and drains the waste into the waste tank together.

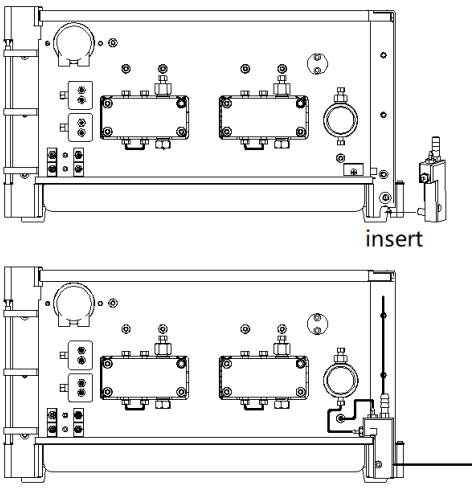


Fig 2-13 Multi-channel pipeline connection

2.6 Clean Bottle Assembly

Before using the mobile phase liquid, it should be strictly filtered with a membrane with a pore diameter of not more than 0.45μm, and degassed. Otherwise, the tiny solid particles in it will seriously damage the service life of the syringe and reduce the injection precision, while the tiny bubbles will cause the injection. Repeatability is worse.

The degassed mobile phase liquid is poured into t mobile phase bottle, and the mobile phase bottle is sealed with the matching bottle cap. Place the mobile phase bottle in the standard position as shown in Fig 2-14, then insert the pipe into mobile phase bottle and make sure the pipe is at the bottom of the mobile phase bottle.

2.7 Sample tray

The auto sampler sample tray is divided into a left tray (1#~60#) and a right tray (61#~119#, blank). The position of the positioning pins under the two trays is different. Please place them in the style of Fig 2-14.

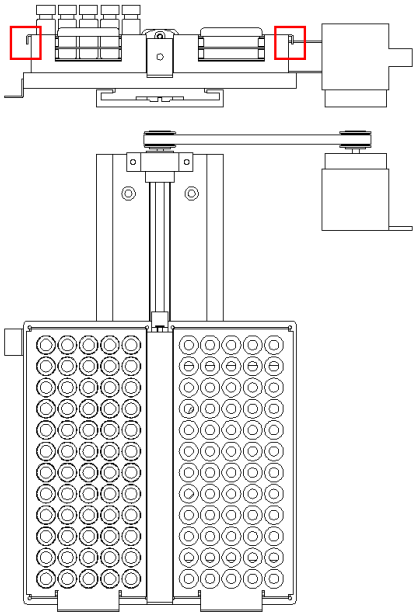


Fig 2-14 Sample tray placement

2.8 Syringe Exhaust

When the mobile phase bottle is replaced, the washing liquid at the front end of the liquid washing pipe will be lost, and the air bubbles will be entered into the pipe. To ensure good sample repeatability, the syringe should be vented after replacing the liquid washing bottle. Usually, the auto-sampler will automatically perform self-test and syringe exhaust after power-on, so the waste bottle should be placed before starting up. If the waste bottle is replaced after the instrument has self-tested, after replacing the waste bottle, click on the “Cleaning” button in the “Auto-sampler” module in Kromstation to vent the syringe.

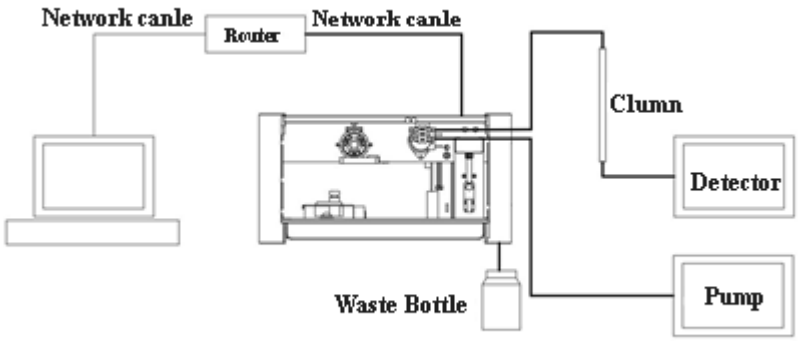


Fig. 2-15 Connection diagram

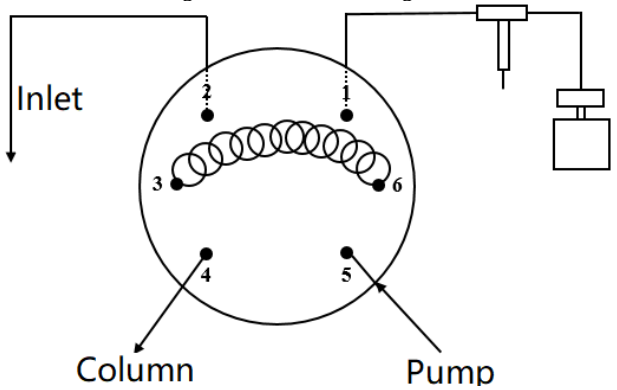


Fig 2-16 Six-way valve connection diagram

【Warning】 **The router used to connect to the auto-sampler is a dedicated communication router. It is not allowed to connect to any other network and connection. Otherwise, communication stability and reliability may be greatly reduced or communication may be interrupted. The instrument communication caused by the user's private connection to the network may result. The problem, our company has the right to refuse to carry out maintenance and repair.**

2.9 Verification

In normal instance, the instrument customers received have been tested and came with verification, the performance met our requirements in factory, users have no need to test and verify. If you have any doubt about the performance of the instrument, verify it refer to the following steps:

【Caution】 **The test results of the automatic sampler are affected by the whole system. It is important to ensure the normal operation of other equipment except the automatic sampler.**

- **Chromatographic conditions**

Components	content
moving phase	methanol/water=85/15(v/v)
chromatographic column	C18
velocity	1.0mL/min
wavelength	254nm
response time	1.0S
automatic sampler washing liquid	methanol/water=85/15(v/v)
standard sample	naphthalene

- **Method setting**

Use the default parameters of the automatic sampler in S3220L.

- **Injection repeatability（S3220L）**

Sample volume is 10μL, repeat injection 11~13 times, and the RSD value is calculated for 11 times of peak area. RSD≤0.5%.

- **Injection linearity（S3220L）**

Injection volume is 5μL, 10μL, 15μL, 20μL, 25μL, respectively. For each 3-time injection, linear curves are taken for the average of the same volume input peak area and the input volume, $r^2 \geqslant 0.999$.

- **Samples of residual（S3220L）**

When the sample volume is 20μL, one stitch for the standard naphthalene samples and the blank solution, peak area of Standard naphthalene is divided by the blank solution the peak area of naphthalene , and multiplied by 100%, the residual shall be ≤0.01%.

2.10 Transportation

The detector is a precision instrument, please gently while long-distance transportation, severe vibration, drops are likely to cause damage to the internal parts of the instrument. The random original packaging can effectively protect the instrument.

When the instrument is required to move or returned for service, please follow these steps for packaging.

1) Turn off the power.
2) Unplug the power cord and communication lines.
3) Removing the connecting pipe and other elements between components.
4) Remove the detector from chromatography system, put it into special sealed bag on a large platform.
5) Placed the fixed detector and other accessories into original packaging carefully.
6) Tape the box sealed to prevent liquid from entering. Cover the packaging box with plastic wrap is recommended.
7) Transport packaged instrument.

【Caution】 **Before packing, please check the box, if the original packaging has been damaged, do not use it, you should consult your local dealer or Elite Analytical Instruments Co., Ltd. customer service staff to solve!**

Chapter 3 Instrument operation

3.1 Power On and Turn Off

Power On:Put the total power switch on the back panel at the "I" position, and the automatic sampler enters the energizing state, the power indicator light on the front panel turns red. After a short time of self-inspection, the instrument enters the normal operation state, and the state indicator light will change from colorless to green and always on.

Turn Off:Put the total power switch on the back panel in the "O" position.

3.2 Software installation

There are third kinds of automatic sampler control software: Kromstation (including S3220L automatic sampler control module) and S3220L automatic sampler control module.

The Kromstation (including the control module of S3220L automatic sampler) can be used by using the EClassical 3200L chromatography system of our company. This software can fully control the instrument in the above two systems. and automatic sampler.

Other uses can use S3220L automatic sampler control module to control the automatic sampler.

3.2.1 Selection of lotions

Hardware requirements

- The lowest hardware requirement: Intel Core 2 CPU，2G RAM, more than 1G hard-disk space .
- Display resolution: at least 1024×800，64K(16 bit image).
- Others: USB for encryption (Hardware Key) and software installation.Network interface (LAN) for device communication.
- Network management requirements: the computer used to connect the HPLC is not networked. If it is necessary to connect to the Internet, please contact the engineer of Elite Analytical Instruments Co., Ltd.

Operation system requirements

- Windows 10 64 bit or higher version.
- The operating system used to run the Kromstation.
- The fire walls of the control system are closed.
- The operating system of "make the computer to sleep" option is set to "never".
- Set the network adapter properties, confirm the "allow the computer to turn off this device to save power" of network adapter "power management" option is not be selected.
- Antivirus software is not recommended for computers connected to the EClassical 3200L, and must ensure that mobile storage equipment for the copies of data without any computer viruses.

Workstation requirements

- The Kromstation is required to control the instrument's operation.

3.2.2 Computer network IP Settings

- Before installing software, you should set up your computer network.
- Right-click network places on your desktop and left-click properties.

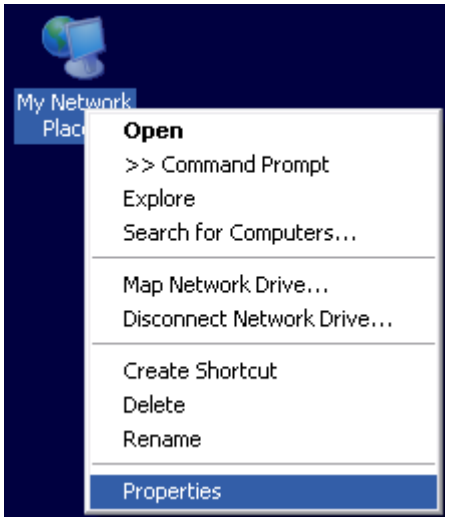


Fig. 3-1 Computer network Settings picture 01

After entering the network connection window, right-click local connection and left-click properties.

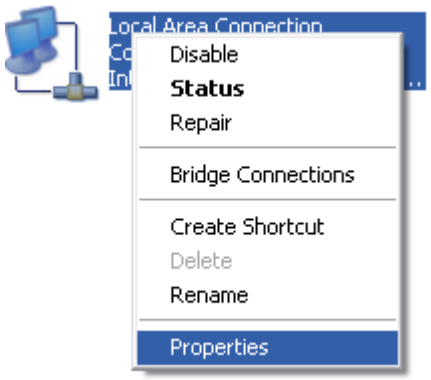


Fig. 3-2 Computer network Settings picture 02

After selecting Internet protocol (TCP/IP) in “this connection uses the following items”, click “Properties”.

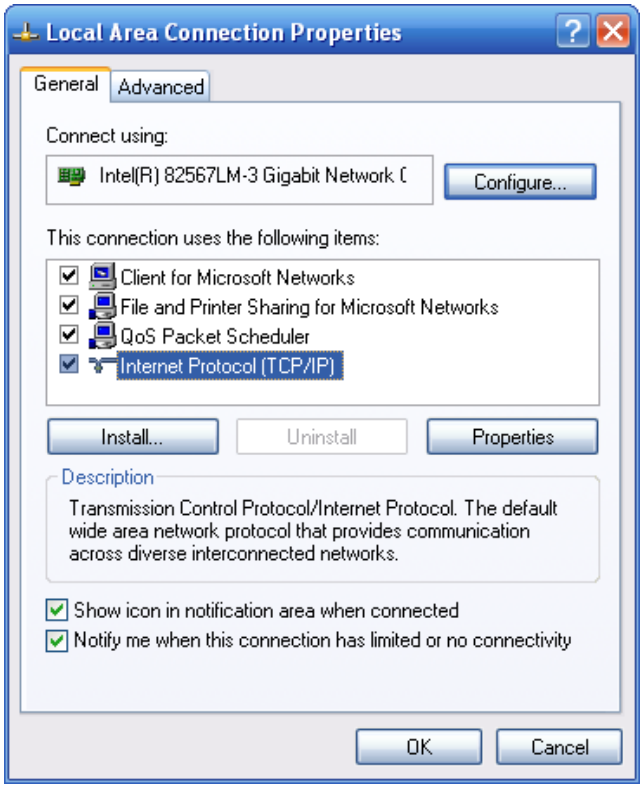


Fig. 3-3 Computer network Settings picture 03

After entering the “Internet protocol (TCP/IP) properties” dialog box, set the IP address as shown in Fig. 3-3. Click “ok” after setting.

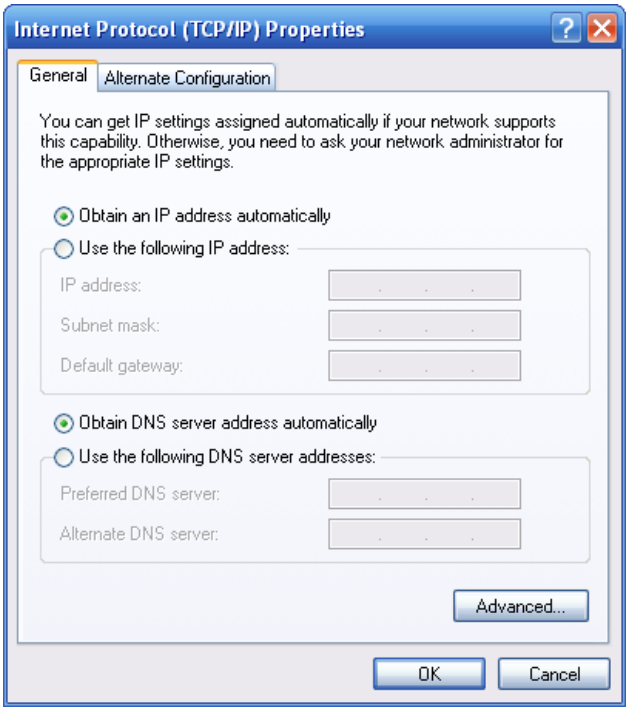


Fig.3-4 Computer network Settings picture 04

Click ok again in the local connection properties dialog box to make the system accept the above changes.

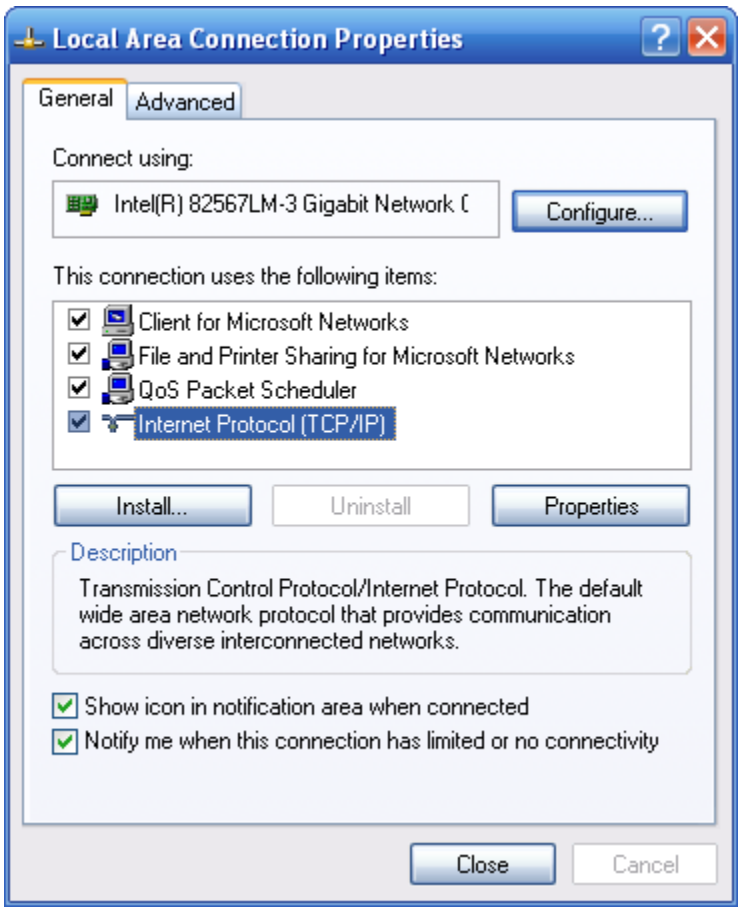


Fig.3-5 Computer network Settings picture 05

【Caution】 **Client-computers must be equipped with network communication and corresponding drivers in the form of LAN interfaces as hardware communication.**

3.2.3 chromatography data workstation installation

The installation method of Kromstation is shown in the operating instructions attached to the disk of Kromstation.

3.2.4 automatic sampler control module installation

Put the S3220L control module into the optical drive, copy all folders, find the " Control Module.exe" file and double-click, it will run.

3.3 Workstation structure

All the methods and most functions of the detector can be realized by the control of chromatographic data workstation. Fig. 3-6 shows the structure of the chromatographic data workstation.

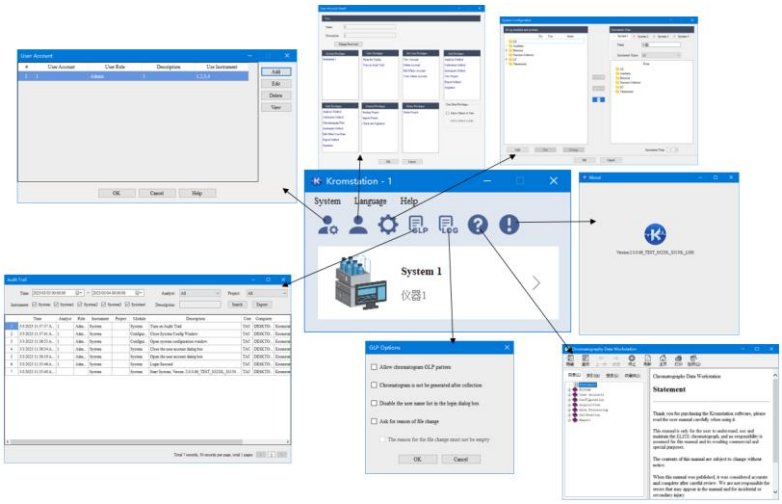


Fig.3-6 Kromstation workstation structure diagram

3.4 Preparatory work

3.4.1 Selection of lotions

Before using the S3220L for the experiment, you should first observe whether the lotion is sufficient, and it is recommended to add the filtered and degassed lotion before opening the instrument.

When choosing a lotion, consider the following:

- Samples are highly soluble in detergents.
- Poor stability of lotion leads to precipitation and Plug the inlet valve and line
- Washing liquid and moving phase can be mixed at any ratio, washing liquid should not produce interference peak
- The device should be used to allow washing fluids within the pH range
- Normally, the moving phase can be used as wash solution, but when the fluid phase contains buffer salts, the non-salt mobile phase can be used as wash solution.

【Note】 **When the washing liquid is empty, there may be a problem of no peaks when the sample is injected, so be sure to increase the washing liquid when using the sampler**

3.4.2 Power On Self-Test

Set the power switch on the rear panel of the instrument to the "I" position, and the S3220L will perform a self-check operation for about 60 seconds.

【Caution】 **When S3220L self-test, you must close the front door, never allow the hand into the instrument, otherwise may cause serious mechanical damage to the human body!**

3.4.3 Place sample tray

After the S3220L self-test is completed, the user can take out the sample tray, place the sample bottle, and then put it into the automatic sampler.

【Caution】 **The tray must be placed smoothly in the order of left tray (1#~60#) and right tray (61#~120#). The wrong placement may cause serious damage to the needle or motor .**

3.4.4 Standard vial selection

The standard vial recommended for S3220L is shown in Table 3-1.

Table 3-1 Recommended standard vial type

	Name	Specifications	Minimum sample volume	Distance from needle tip to bottle bottom (set)
	Standard Vial	1.8mL	≈360μL	1.0mm
	Standard Casing	300μL	≈15μL	2.0mm

【Caution】 **To ensure the injection performance of the S3220L, use the recommended standard vial and casing. If the use of non- standard vial and sleeves lead to poor sampling repeatability, sample needle damage and other consequences ， the user should bear!**

3.5 System Configuration

Before using S3220L, please add S3220L auto sampler in the configuration interface of Kromstation and enter the IP address of the instrument. The specific operations are as follows:

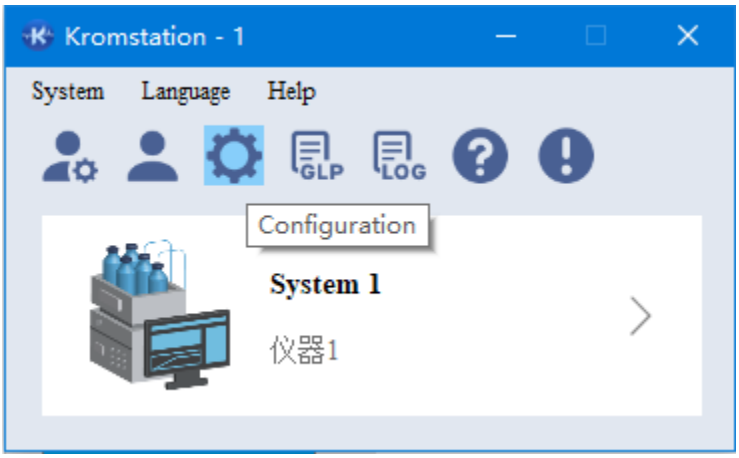


Fig.3-7 Configuration Interface 01

2) The system configuration interface is displayed. As shows in Figure 3-8:

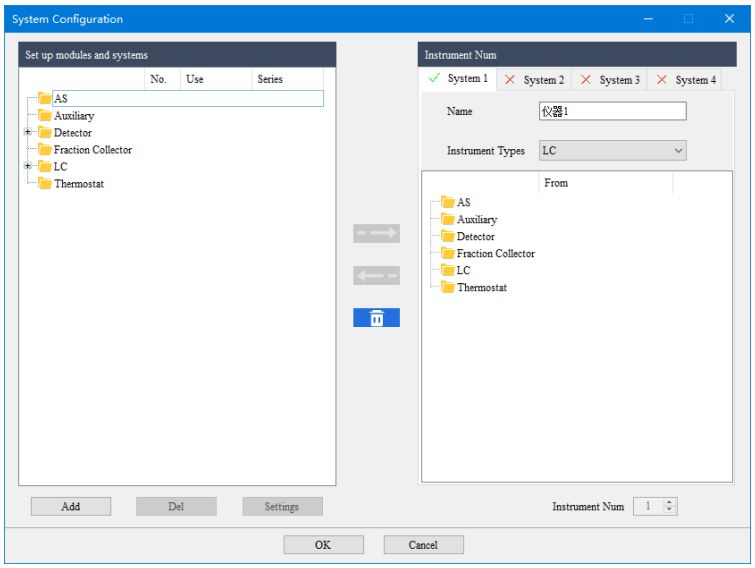


Fig.3-8 Configuration Interface 02

3) Click the "Add" button at the lower left corner of interface Fig. 3-8, and the interface as shown in Fig.3-9 will pop up:

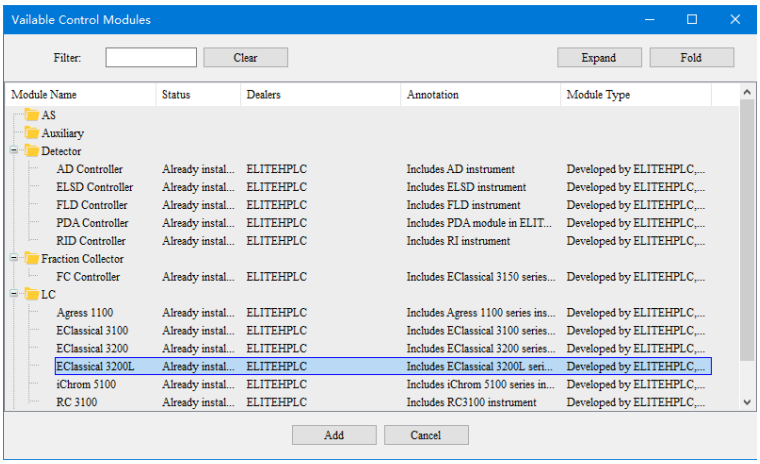


Fig.3-9 Configuration Interface 03

4) Select EClassical 3200L Controller, double-click to enter the configuration screen, and enter the IP address to verify the system.

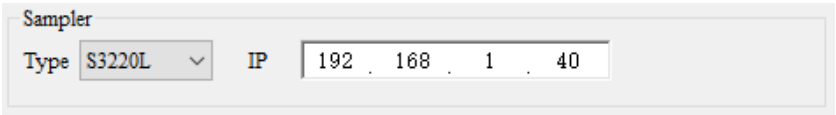


Fig.3-10 Configuration interface

3.6 Method setting

3.6.1 Sampling function

Before using the S3220L for sequence analysis, first set the auto sampler method, as shown in Fig 3-11.

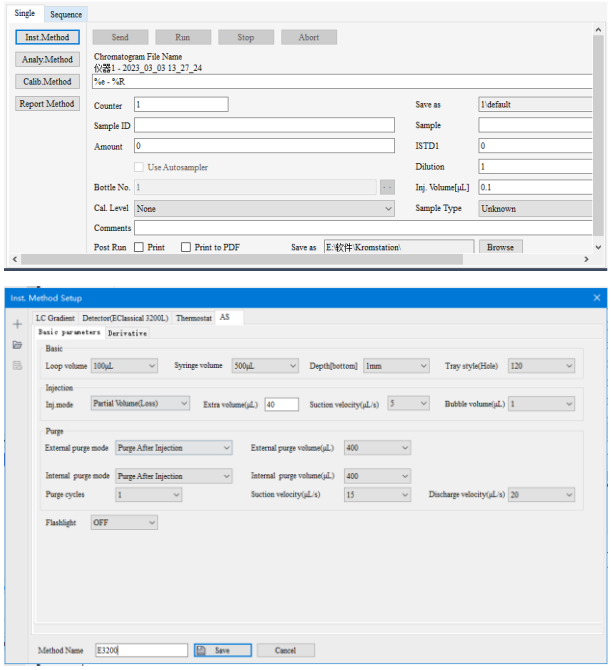


Fig.3-11 Method setting interface

- ***Sampling mode***

  There are three kinds of injection modes to choose from, which are full quantitative loop injection, partial lossy injection and partial lossless injection.

- ***Additional injection volume***

  It is recommended to use 33 μL for the additional sample loss under full quantitative loop injection, partial lossy injection and partial lossless injection modes. It can ensure the injection repeatability.

- ***Suction sample speed***

  By default, it can meet the suction speed of most sample viscosities. If the sample is particularly viscous, this parameter can be reduced to 2.

- ***Bubble volume***

  It is used to isolate the bubbles between the sample and the cleaning solution or blank solution, and can well prevent the sample diffusion effect. Normally 1 μL can meet the needs of most cases.

- ***Cleaning method***

  There are four modes to choose from: no cleaning, cleaning before injection, cleaning after injection, and cleaning before and after injection. It is recommended to use post injection cleaning and pre and post injection cleaning, which can not only avoid cross contamination, but also prevent the solidified sample from damaging the injection valve.

- ***Suction liquid velocity***

  When cleaning the sample probe, the suction rate of the washing solution.

- ***Discharge liquid velocity***

  The discharge rate of the washing solution when cleaning the sample probe.

- ***Cleaning times***

  The number of times to clean according to the cleaning mode.

- ***Cleaning volume***

  Volume of lotion consumed during each cleaning.

- ***Floodlight***

  Set the switch of S3220L in the instrument method.

【Note】 **When using the non-destructive injection mode, it is recommended to replace the cleaning solution with an organic phase solution with the same proportion as the initial mobile phase.**

3.6.2 Derived function

Before using the S3220L for derivatization sequence analysis, first set the auto sampler derivatization method, as shown in Fig.3-12.

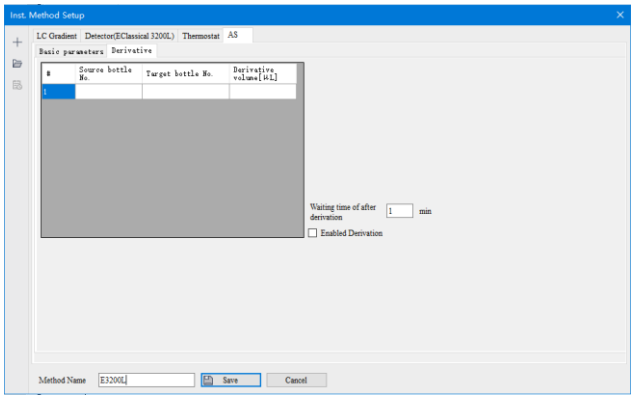


Fig.3-12 Derivation setting interface

- ***Number of source bottle***

It refers to taking a certain volume of sample from the sample bottle to the target bottle number.

- ***Target bottle number***

It refers to taking a certain volume of sample from the source bottle number into the sample bottle, and performing derivatization / mixing reaction in the sample bottle.

- ***Volume***

It refers to the sample volume from the source bottle number to the target bottle number.

- ***Wait time after derivation***

It refers to the waiting time from the end of the whole derivation process to the time before injection.

- ***Enable derivatives***

When using the derived function, check the box on the left, otherwise the derived function will not be enabled.

The derivative function of sampler can not only realize the derivative injection process, but also realize the automatic configuration process of standard curve.

- ***Example of derivation method settings***

For example, the user needs to use 100 μg/ml naphthalene solution and prepare 50 μg/ml naphthalene methanol solution as follows:

Sample placement: place solvent methanol in 4#sample bottle and standard naphthalene (100 μg/ml) in 5#sample bottle.

Method setting: set the derivatization method according to the following Fig.3-13 methods. The solution obtained in the last 1#bottle is 50 μg/ml naphthalene methanol solution.

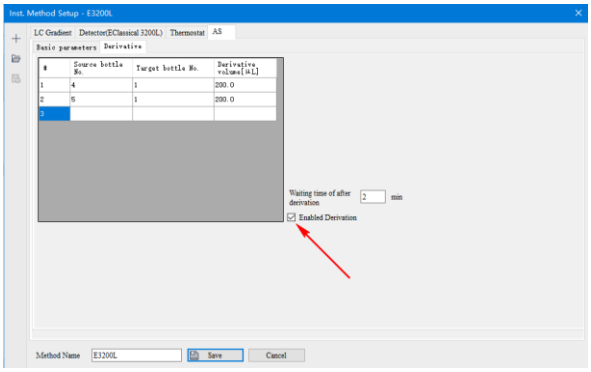


Fig.3-13 Derivation method settings

【Note】 **In order to ensure the injection accuracy and derivatization effect, it is recommended that the total derivatization volume be greater than or 、equal to 400 μL and less than or equal to 1800 μL.**

3.7 Sequence analysis

3.7.1 Kromstation chromatographic data workstation

When using kromstation chromatographic data workstation to control sampler, the sequence analysis can be set and run according to the following steps:

1) After entering the workstation, click the "sequence" interface, as shown in

Fig.3-14 below. Click the sequence analysis button to enter the sequence analysis dialog box.

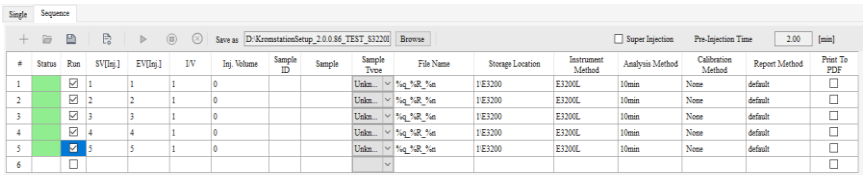


Fig.3-14 Sequence analysis open method

2) In the sequence analysis dialog box, fill in the starting sample bottle number, ending sample bottle number, injection times, injection volume, sample type, spectrogram name, storage location, instrument method, analysis method, calibration method, reporting method, etc.

Sequence analysis dialog box settings:

- **"Status"** refers to the status of the sequence. It refers to whether the sequence is in the status of waiting for running, running or completed running. The running status is displayed as , the waiting running status is displayed as , and the running completion status is displayed as .
- **"Operation"** refers to whether the line sequence needs to be operated. If it needs to be operated, it will be displayed as a status. If it does not need to be operated, it will be displayed as a status.
- **"Starting bottle"** refers to the starting sample bottle number.
- **"Termination bottle"** refers to the termination sample bottle number.
- **"Number of injections"** refers to the number of injections per sample bottle.

- **"Sample ID"** refers to the sample identification number, which is used to distinguish samples. Description information of no more than 64 characters can be set.
- **"Sample name"** refers to the name of the injected sample.
- **"Sample type"** is only used when the sample for this injection is "unknown", "standard" or "bypass". The "unknown" is generally used when the sample is injected, "standard" generally refers to the standard curve. The "bypass" is not injected and is generally used when the system is balanced.
- **"Spectrum name"** refers to the name of the chromatogram saved, and the suffix of the spectrum name can be selected as required.
- **"Total sample quantity"** refers to the sample quantity required to prepare the solution.
- **"Sample dilution degree"** refers to the sample dilution factor. The result calculated by the calibration file will be automatically multiplied by the corresponding dilution factor to obtain the final calculation result, which appears in the report form, and the default value is 1.
- **"ISTD1 quantity"** refers to the quantity of internal standard substance 1 in the internal standard method. If there are multiple internal standards, you can right-click to select Add.
- **"Instrument method"** refers to the method of controlling the instrument.
- **"Analysis method"** means the method used for the analysis, including the running time.
- **"Standard method"** refers to the calibration method to be used for automatic calibration of this chromatogram.

【Note】 **When using the derivation method, "sample type" needs to select "unknown" or "calibration", and "bypass" cannot be selected.**

3) After editing the sequence, the workstation will automatically check the sequence. Click the run sequence in the toolbar above the sequence to start the analysis sequence.

4) After the sequence analysis is completed, the corresponding sequence status changes, as shown in Fig.3-15.

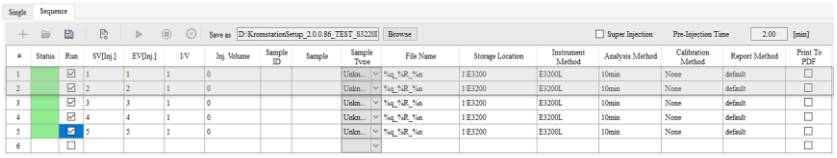


Fig.3-15 Status after sequence analysis

5) If you want to run the sequence again, just select the completed sequence and right-click "reset status", as shown in Fig.3-16.

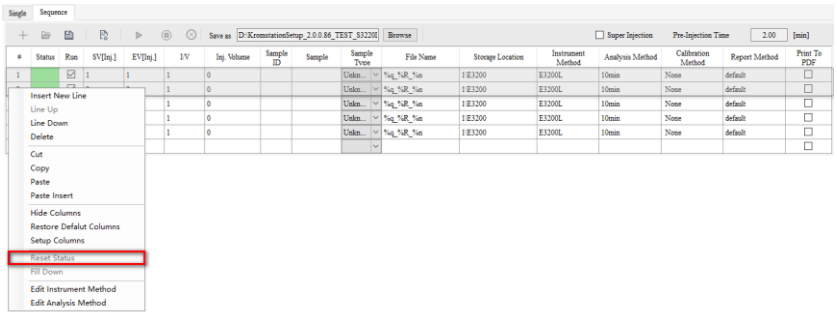


Fig.3-16 Complete sequence reset

Chapter 4 Maintenance and repair

4.1 Indicator status and meaning

An LED indicator is installed at the bottom of the front panel of S3220L, which represents the power and instrument status indicators, as shown in Fig.4-1.

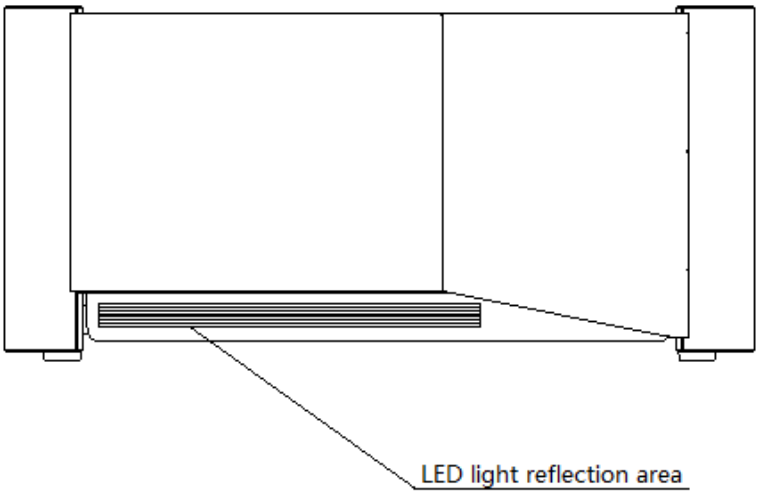


Fig. 4-1 LED indicator

The power indicator light can intuitively indicate that the instrument is in the state of self-checking, running, and fault alarm; the self-checking state indicator light flashes slowly, when the self-checking passes, the indicator light is always on, and it means that the instrument is in normal operation state, when an alarm occurs When the indicator light flashes quickly, it means that the instrument has a fault alarm.

4.2 Failure comparison table

When the workstation detects a failure, a prompt dialog box will automatically pop up, and the error code will be given in the dialog box. The user can query the cause of the failure according to the error code.

Table 4-1 Error code and fault comparison table

Fault number	Fault description	Indicator status	Solution
SB00	System CPU operation failure	Flashing	----
SB01	EEPROM failure	Flashing	----
SB02	8M crystal oscillator failure	Flashing	----
SB03	32K crystal failure	Flashing	----
SB04	Operational failure	Flashing	----
SB05	Leakage	Flashing	----
SS00	System CPU operation failure	Flashing	----
SS01	EEPROM failure	Flashing	----
SS02	8M Crystal vibration failure	Flashing	----
SS03	Syringe motor failure	Flashing	----
SS04	Y axis motor failure	Flashing	----
SS05	X axis motor failure	Flashing	----
SS06	Injection valve motor failure	Flashing	----
SS07	Syringe motor failure	Flashing	----

4.3 Troubleshooting and handling of common faults

The automatic sampler sometimes malfunctions during operation. Please contact our customer service or local agent if you can not solve the problem by looking at the common trouble and solution list.

4.3.1 Poor repeatability of injection

Poor sampling repeatability is One of the more prone problems. Please check the system according to the following points.

- ***Lack of washing fluid or pipe nozzle above liquid level***

The lotion bottle must be placed in the specified position, must ensure that there is adequate washing liquid, and the lotion pipe nozzle is below the level of the lotion liquid.

- ***Insufficient degassing of washings lotion***

Very small bubbles can affect repeatability, especially when the size of the injection is very small. Therefore, the lotion must be strictly degassed before being used.

- ***Bubble volume is too large***

S3220L provides 1-5 μL bubble volume for selection. When the sample viscosity or suction rate is fast, the bubble volume is too large (for example, 4~5 μL), which may make the injection repeatability worse.

- ***The speed of inhalation is too fast.***

When the viscosity of the sample is high, the reduction of the injection rate can significantly improve the injection repeatability and the default suction rate of S3220L is 5 μL/s, which can generally meet the requirements of most samples. If you cannot achieve good injection repeatability at the default suction rate, try changing the suction rate to 2 μL/s.

- ***Syringe piston damage***

The syringe may wear out the piston or the tube wall of the syringe due to the long time of use or the unfiltered degassing of the washing liquid, resulting in air leakage and poor repeatability of the injection. Users can change syringes to improve injection repeatability.

- ***Selection of sample bottles***

Please use the standard sample bottles provided by our company. The sample bottles not approved by Elite Analytical Instruments Co., Ltd will also lead to poor sampling repeatability.

- ***Wear of injection valve***

For a long time, the automatic sampler carries on the sample analysis which is easy to precipitate. The sample is not filtered by 0.45 μm filter membrane, or no cleaning operation is carried out after the sample is injected, all of which may cause the rotor of the injection valve to be worn by solid particles, resulting in poor repeatability of sample injection and even leakage.

- ***3-way-2-position valve pollution***

Inadequate cleanliness (impurities, bacteria, etc.) may contaminate the diaphragm of 3-way -2-position isolating solenoid valves, resulting in lax sealing. Please be sure to ensure the cleanliness of the lotion, do not use lotion with high water content.

- ***Under the partial volume injection (no sample loss) mode, the blank solution is insufficient***

In the partial volume injection (no sample loss) mode, the blank position of the right tray must be guaranteed, the sample bottle with the blank solution should be placed, and the blank solution must be sufficient.

- ***Pump flow instability***

In addition to the problems of the automatic injector equipment itself, if the flow rate of the pump is instable, it may also result in poor injection repeatability.

- ***The column is damaged or the equilibrium time is not enough.***

when the column is damaged or the system equilibrium time is not enough. There may also be problems of poor repeatability. If necessary, replace the chromatographic column to prolong the equilibrium time of the system.

- ***Environment temperature instability***

Use this instrument in accordance with the temperature conditions specified in the previous article. In order to obtain more ideal experimental data, O3220L column thermostat box was used in the specified temperature conditions.

4.3.2 Injection does not produce peak

If there is no peak in the injection, please check the system according to the following points, please check the following systems:

- ***Zero sample volume.***

Please check the input value of injection volume in sequence analysis, if 0, do not sample.

- ***Sample shortage***

When the liquid level of the sample bottle is low to a certain extent, the sample cannot be inhaled, which will lead to no peak injection. At this point, the bottle should be supplemented with samples.

- ***Sample bottle position error***

Please approve that the sample bottle number entered in the ordinal list corresponds to the position actually placed on the sample tray, otherwise the air will be injected into the system because of the wrong placement.

- ***Insufficient lotion***

When the washing liquid is used up, it will cause the problem of no peaks in the sample injection. Please replenish the washing liquid in time. In order to ensure the repeatability of the injection, the washing liquid must be consistent with the mobile phase.

- ***3-way-2-position valve failure***

when 3-way-2-position valve malfunction, the sample will not be inhaled in the sample. Injection valve, thus will lead to the sample injection no peak.

- ***Injection valve failure***

When the injection valve fails, the sample will not be switched to the system, which will lead to no peak injection.

- ***High pressure constant flow pump pressure zero***

Please note that the pump pressure is zero, at this time the system mobile phase is not in the flow state, so no peak, please refer to the P3200L high pressure constant flow pump user manual check the high pressure constant flow pump.

- ***Deuterium lamp / tungsten lamp unlit***

The deuterium / tungsten lamp of the user detector does not appear any peak signal without lighting.

- ***Wavelength setting error***

Please check the wavelength setting of the detector, the wrong wavelength may lead to no peak.

- ***Mobile phase mismatch***

Please approve the preparation of the mobile phase, if the organic solvent ratio is not sufficient to remove the substance from the chromatographic column, it may cause no peak problem.

4.3.3 Column efficiency decrease or peak width increase

- ***Connection line leakage***

Please check the output of the automatic sampler, the interface, sample needle connection 3-way-2-position valve connector for leakage problems.

- ***Sample concentration or sample volume is too large***

When the concentration or volume of the sample is too large, the column saturation will decrease the column efficiency.

- ***Chromatographic column life limit***

Columns that have reached their useful life are usually less effective. Replace the columns with good performance.

- ***Error in mobile phase preparation***

The column efficiency may be reduced by the wrong solvent ratio, buffer salt and pH.

- ***Modification of buffer solution (especially ion pair reagents)***

The deterioration of buffer solution will lead to the change of ionic concentration and pH value of solution, which may lead to the decrease of column efficiency.

Common faults and solutions are shown in Table 4-2.

Table 4-2 Comparison table of troubleshooting and handling

Symptoms	Cause	Solutions
Poor repeatability of injection	Lack of washing fluid or pipe opening above liquid level	1.Replenish the lotion 2.Insert the washing pipe below the liquid level
	Insufficient degassing of washings lotion	Re-degassing the lotion
	Bubble volume is too large	Reducing bubble volume
	The speed of inhalation is too fast.	Reduce the suction rate
	Syringe piston damage	Replacement of syringe
	Selection of sample bottles	Use recommended standard sample bottles
	Wear of injection valve	Maintenance of sampling valve roto
	3-way-2-position valve pollution	Replacement parts
	Under the partial volume injection (no sample loss) mode, the blank solution is insufficient	Add blank solution
	High pressure constant flow pump flow instability	1.Removing bubbles 2.Washing filter cup assembly 3.Cleaning one-way valve
	Column damage or insufficient balance time	1.Replacement of chromatographic columns 2.Extend the balance time.
	Experimental environment temperature instability	1.Choosing stable temperature experiment as far as possible. 2.Use O3200L chromatographic column temperature box
Injection do not peak	The injection volume is zero.	Modification of injection volume re-injection
	Sample shortage	Add enough samples
	Sample bottle position error	Put the sample bottle in the right place
	2-bit 3-way solenoid valve failure	Please contact customer service cente
	Sampling valve failure	Please contact customer service cente
	X/Y/Z/S shaft motor fault	Please contact customer service cente
	High pressure constant flow pump pressure zero	1.Check if the emptying valve is open 2.Check whether the system is seriously leaking 3.Emove air bubble 4.Clean filter cup assembly 5.Clean one way valve
	Deuterium lamp / tungsten lamp unlit	Re lighting the deuterium lamp / tungsten lamp
	Wavelength setting error	Reset wavelength

	Errors in mobile phase preparation	Reformulated mobile phase
Column efficiency decrease or peak width increase	Connection line leakage	1.Refastening pipe joint 2.Retighten after replacement of edge ring screws
	Sample concentration or injection volume is too large.	To reduce the concentration or volume of a sample.
	Chromatographic column life limit	Replace chromatographic columns with good performance
	Errors in mobile phase preparation	Reformulated mobile phase
	Modification of buffer solution (especially ion pair reagents)	Reformulated buffer solution

Chapter 5 Maintenance and repair

In order to ensure the normal operation of the automatic sampler, some components need to be maintained and repaired. Maintenance mainly refers to simple maintenance, such maintenance can generally be carried out through the front panel. Maintenance mainly refers to those that need to replace internal parts and disassemble the automatic sampler.

When replacing internal parts, it is necessary to open the cover and remove the faulty parts from the system. The specific operation procedures shall be operated by professional maintenance engineers on site or by professionals according to the maintenance process. In case of any maintenance problem, please contact customer service personnel.

【Note】 **Please do not open the cover without guidance to avoid personal injury or instrument failure!**

5.1 Sample ring replacement

The sample ring volume of the standard automatic sampler is 100 μL. for the users who want the sample volume to be 10 μL or 20 μL, if they want to have better sample injection repeatability (RSD < 0.3%), they can choose to purchase a 10 μL or 20 mL sample ring and replace the sample ring.

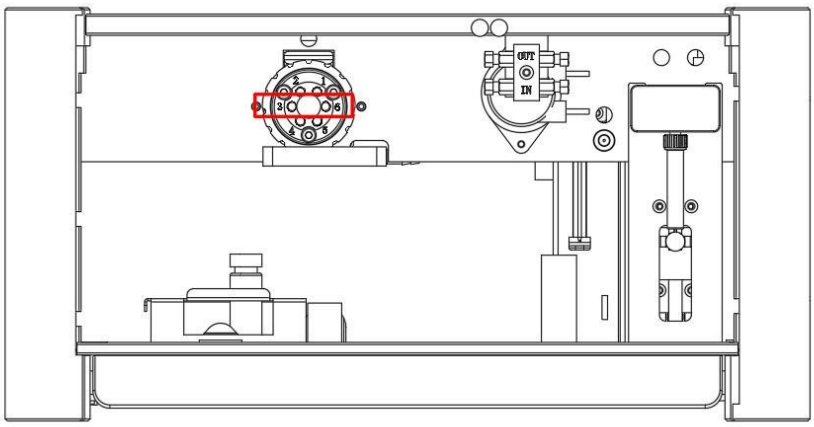


Fig. 5-2 Removal of cover and sample ring position

The specific replacement steps are as follows:

1) Remove the screw of the outer cover of the automatic sampler and open the cover of the automatic sampler.

2) Wrench to remove the screws on the injection valve at the position 3# and 6#, and remove the sample ring.

3) According to the requirement of "2.5.1 pipeline connection", the new sample ring is put into the sampling valve 3# and 6#.

5.2 Replacement of sampling needle

In general, the sample needle of S3220L is very strong, and the equipment has good positioning performance, so the sample needle will not be damaged.

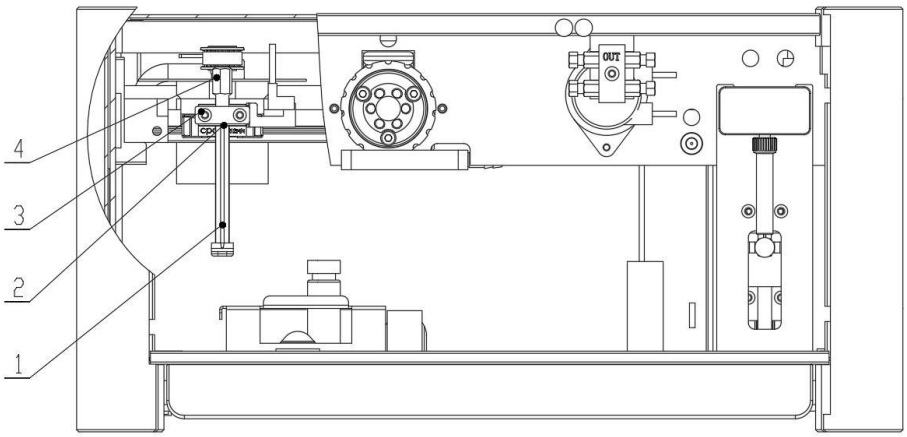


Fig. 5-3 Sample needle position and component name
1. Sample needle; 2. Connecting screw; 3. Pin seat; 4. Needle pressing cap

If a sample needle replacement is required under special circumstances, following these steps:

1) Turn off the power.

2) Push the Z axis assembly (sample needle assembly) to the center of the X axis.

3) Remove the sample needle with a 1/4 "~5/16" wrench.

4) According to the requirement of "2.5.1 pipeline connection", install.

5) Turn on the power supply of the system organizer and wait for the automatic sampler self-inspection to be completed.

Chapter 6 Components and Material List

6.1 Consumption Parts

No.	Describe	PN
1	3/16″-32 SS Nut	14510027
2	1/16″SS Ferrule	14990070
3	1/16"Solenoid Valve Connecting Screw	14992845
4	Omni-Lok	33120148
5	SS Tubing OD1/16"～ID0.007"	12010005
6	SS Tubing OD1/16"～ID0.02"	12010007
7	Pre-Cut Pipe 1/16"-30mm- 1/32"-500mm-0.007"	18990147
8	Silicone Tubing OD9.0 mm × ID6.0 mm	13010119
9	Silicone Tubing OD3.0 mm × ID1.0 mm	13010033
10	PTFE Tubing OD1/16" × ID0.03"	13010031
11	PTFE Tubing OD1/16" × ID0.01"	13010029
12	BPT Tubing	13010158
13	Teflon 6.4×9.6×1.6	13010116
14	Clean bottle assembly/250mL	18080171
15	Clean bottle assembly/250mL/1/8	18080259
16	Power Cable	17000119
17	Twist-Pair	17000035
18	Trigger Wire	18080168
19	T2AL250V Fuse	15080006
20	T-Tee	14992920
21	3-way-2-position valve	15260032
22	Sample needle	14039805
23	Injector	33120892
24	6-way-2-position valve（42MPa）	3202MHP7900 -500-1
25	6-way-2-position valve（102MPa）	3202HT715-000
26	6-way-2-position valve（120MPa）	3215HT718-000
27	Sample loop 100 μL	18990217
28	Sample loop 20 μL	32027755-202

6.2 Optional parts

72 hole sample tray

No.	Name	Describe	PN
1	Sample tray	72 hole	18990294
2	Transparent sample vial	4mL	3201C4015-1
3	Brown sample vial	4mL	36010218
4	Sample vial cap	Blue / 4ml (applicable)	3201C4015-97B
5	Vial cushion	Pre cut / Blue TEF / white silica gel	3201C4015-55

120 hole sample tray

No.	Name	Describe	PN
1	Sample tray	120 hole	18080184
2	Transparent sample vial	2mL	3201C4000-1
3	Brown sample vial	2mL	33120970
4	Sample vial cap + viale cushion / pre cut	2ml (applicable)	3201C5000-55B
5	Vial cushion	2ml (applicable)	3201C4000-98B

210 hole sample tray

No.	Name	Describe	PN
1	Sample tray	210 hole tray	18080185
2	1ml transparent test tube 8 * 40MM + plug	1mL	3312C0000078

Double 96-well sample tray

No.	Name	Describe	PN
1	ST3200-096 Sample tray upgrade package		3403090063
2	96 well plate	0.5ml/sterilization-	3201267245
3	96 well plate	0.5ml/sterilization+	3201267334
4	96 well plate	2ml/sterilization-	3201278752
5	96 well plate	2ml/sterilization+	3201278743
6	96 hole sealing pad	Thermoplastic rubber / sterilization-	3201276002
7	96 hole sealing pad	Thermoplastic rubber / sterilization+	3201276000
8	96 hole sealing pad	Silica gel / sterilization-	3201276011

Appendix

Introduction for Tubing Materials

In HPLC systems, column system, piping, fittings, and outside the injector and Extra-column of detector are likely to cause peak broadening. Improper tube material will also lead to peak broadening, even causes the sample degeneration, which affects the reliability of analysis results directly.

Different pipeline material is needed according to system pressure, properties of mobile phase and samples. Commonly used pipe materials including stainless steel, polyether ether ketone (PEEK), Teflon, poly (vinylidene fluoride), polyethylene or polypropylene, the stainless-steel pipe is most commonly used.

Outer diameter of HPLC system is 1/16"(1.59 mm). Inside diameter can be chosen according to your need, Commonly used inside diameter including 0.007"(0.175 mm)，0.01"(0.25 mm)，0.02"(0.5 mm)，0.03"(0.75 mm) and 0.04"(1.0 mm) etc..

Stainless steel tube is generally used in high pressure part. In HPLC systems, from the pump discharge to column inlet part is high pressure section, stainless steel tube is recommended.

Stainless steel tube has good corrosion resistance and coaxially, bore pipe and joint should be matched well while using it.

Also, polymer tube can be used in many sections of HPLC system, such as low pressure parts：from liquid bottle to export pump, detector and sampler drainage mouth, emptying valve outlet and others. Teflon is inertial to HPLC solvent and is the most commonly used plastic pipe.

When the pressure is lower than 20 MPa, peek tube is lazier than stainless steel tube and is more suitable for biological sample analysis.

Safety Information

General safety information

At different stages of the instrument operation, maintenance and repair, everyone should abide the following general safety rules. Breaking these rules may cause damage to instruments or staffs. Elite Analytical Instruments Co., Ltd is not responsible for the impact caused by non-standard operation.

Standard of security

The safety class of this equipment I (to provide ground protection terminal), and it is manufactured and tested according to national safety standard.

Symbols	Descriptions
	Before using equipment marked with this symbol, please refer to the instruction manual first to avoid harm to the operator and the equipment.
［Warning］	Casualties may appear. Please do not operate beyond the scope of warning, unless you have fully understood and met the required conditions.
［Caution］	Data loss or equipment damage may appear. Please do not operate beyond the scope of caution, unless you have fully understood and met the required conditions.
［Note］	Unsatisfactory experimental data and instrument failure may appear. Please do not operate beyond the scope of note, unless you have fully understood and met the required conditions.

ELITEHPLC

About Elite
Suzhou Elite Science & Technology Co., Ltd.
701#, Building 10, Liandong U Valey,No. 179 Zhujiawan Street,
Gusu District, Suzhou, Jiangsu , China.
Tel: +86-512-67997535
E-mail:info@eliteHPLC.com
Web:http://www.elitehplc.com