

ECLASSICAL
3200L
UHPLC

USER
MANUAL



Operation Manual for O3230L Column Oven

V1.0.6

Statement

The manual is intended to help users to understand, use and maintain O3230L Column Oven. Elite Analytical Instruments Co., Ltd. does not assume the responsibility caused by business or special purpose use of the manual.

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Please read the document carefully before using O3230L Column Oven.

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 can result in serious injury or damage to health and property. The property damage includes the environment around and the instruments.



[Caution] Failure to properly follow the instructions and precautions indicated by this sign can result in minor injury or damage to health and property. Slight injury means no hospitalization is needed to the wounded. Slight property damage means the instruments 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】 O3230L Detector should only be used as a part of liquid chromatography.

Do not use it for any other purpose. Except for special instructions, the 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 coming into contact with the eyes or skin.



【CAUTION】 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°C to 30°C 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 needs 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 (0.45 μ m), and an online filter is also necessary to prevent small particles from scratching plunger rod, seal ring or blocking pipeline. 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 pipeline.
- ◆ Before sample test, ensure that the pipeline 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 pipeline jam, and even system paralysis.
- ◆ Halogen ions is harmful for stainless steel, if there is stainless steel pipe 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 pipe in your system, it is important to note that:
 - 1) 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.
 - 2) When using PEEK pipes, the pressure of the system should be lower than the tolerance pressure of PEEK material, otherwise it may burst.
 - 3) The bending radius of PEEK pipe should be more than 10mm, make the PEEK pipe natural relaxation during installation.

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

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. pipe 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.

CATALOGUE

CHAPTER 1 INTRODUCTION	2-1
1.1 BRIEF INTRODUCTION	2-1
1.2 FUNCTIONAL FEATURES	2-3
1.3 PERFORMANCE INDEX.....	2-5
1.4 PHYSICAL SPECIFICATIONS.....	2-5
1.5 INTRODUCTION TO OPTIONAL VALVES	2-6
1.5.1 6-Position, 7-Port.....	2-6
1.5.2 2-Position, 6-Port.....	2-6
1.5.3 2-Position, 10-Port.....	2-10
1.6 CONFIGURATION VALVE AND APPLICATION.....	2-11
1.6.1 Column Automatic Switching (6-Position, 7-Port)	2-11
1.6.2 Multidimensional chromatography	2-12
1.6.3 Column regeneration (2-Position, 10-Port)	2-14
1.6.4 On-line SPE (2-Position, 10-Port)	2-15
1.6.5 Sample injection + Concentration (2-Position, 10-Port)	2-16
CHAPTER 2 INSTALLATION AND TRANSPORTATION	2-17
2.1 OPEN PACKAGE INSPECTION AND STANDARD ACCESSORIES	2-17
2.1.1 Remove the package	2-18
2.1.2 Packing list	2-19
2.2 STACKING MODE.....	2-20
2.3 INSTALLATION ENVIRONMENT REQUIREMENTS	2-22
2.3.1 Site requirements	2-22
2.3.2 Power cord.....	2-24
2.3.3 Computer requirements	2-25
2.4 THE REAR PANEL IS CONNECTED TO THE INSTRUMENT	2-27
2.5 INSTALLATION OF CHROMATOGRAPHIC COLUMN PIPELINE SYSTEM.....	2-29
2.5.1 Column installation position.....	2-29
2.5.2 Chromatographic column pipeline connection	2-31
2.5.3 Chromatographic column connection with protective column	2-31
2.6 TRANSPORT	2-33
CHAPTER 3 BASIC OPERATION	3-1
3.1 POWER ON	3-1
3.2 FUNCTION.....	3-5
CHAPTER 4 ROUTINE MAINTENANCE.....	4-1
4.1 PRECAUTIONS FOR USE	4-1
4.2 FUSE REPLACEMENT	4-1
CHAPTER 5 PARTS AND MATERIALS LIST	5-1
5.1 CONSUMABLE PARTS.....	5-1
5.2 OPTIONS.....	5-2

APPENDIX **I**

Chapter 1 Introduction

1.1 Brief introduction

Classical O3230L Column Oven (O3230L for short) is one of the Classical 3200L series products launched by Elite. O3230L Column Oven is a new type of high performance liquid chromatography Column Oven with refrigeration function designed and developed by Elite on the basis of O3230L Column Oven.

As the column temperature control unit of this series of high performance liquid chromatographs, O3230L Column Oven can be conveniently used with various liquid chromatography detectors, automatic sampler, high-pressure constant flow pump and other units, and can also be used as chromatographic column temperature control unit alone.

The main purpose of O3230L Column Oven is to maintain the constant temperature of chromatographic column and flow path, so as to improve the separation effect and repeatability of analysis results. In addition to the chromatographic column, the O3230L Column Oven can also be equipped with chromatographic column switching valve, reversing valve and other flow path accessories. Thanks to the latest design of heating and cooling mode and control module, the key indicators of temperature rising and cooling speed and temperature control stability have been greatly improved. In addition, it has many functions, such as pipeline preheating, leakage alarm, over temperature alarm, temperature protection and power off, temperature calibration, etc., to ensure the safety of use, and make the analysis more

stable. Through the control of chromatographic data workstation, it is convenient to control the functions of column temperature box and meet the requirements of production and scientific research. O3230L Column Oven is very suitable for the application of high performance liquid chromatography in medicine, biochemistry, environmental protection, quality control and other fields.

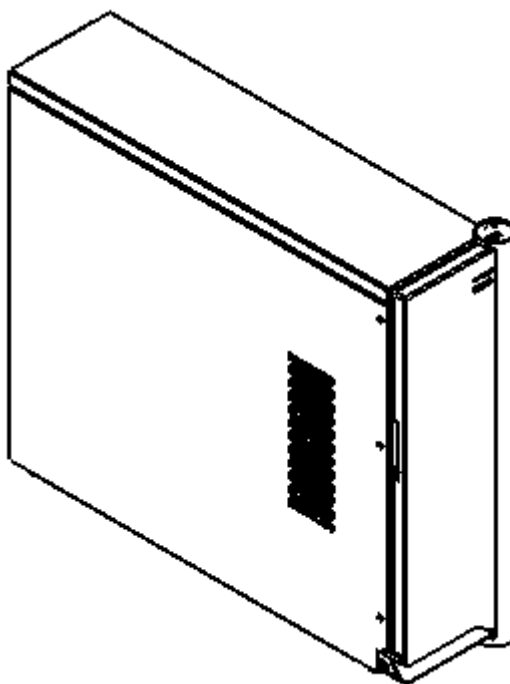


Fig.1-1 Appearance of O3230L Column Oven

In addition to Column Oven, high performance liquid chromatograph also includes high pressure constant flow pump, detector, automatic injector (manual injection valve), high performance liquid chromatography column and data processing system (recorder, integrator or workstation). In addition to providing O3230L Column Oven for customers, Elite can also supply a complete set of high performance liquid chromatograph and any other unit components of high performance liquid chromatograph. For other parts of HPLC, such as high pressure constant flow pump, UV detector, automatic injector (manual injection valve), chromatographic data workstation, recorder or integrator, please refer to the corresponding user's manual or consult the sales personnel.

1.2 Functional features

The O3230L Column Oven with independent intellectual property rights is developed independently by Elite based on the current advanced technologies at home and abroad. The main features of the incubator are as follows:

- The PID segmented control technology is adopted, which can raise temperature rapidly and reduce the time needed for temperature balance;
- High precision temperature probe, temperature calibration function and built-in temperature calibration curve algorithm are used to ensure the accuracy and repeatability of temperature in the temperature chamber of chromatographic column at different room temperature;

- Alarm temperature function, customers can set the alarm protection according to the needs. When the temperature in the column temperature box is higher than the set alarm temperature, the column temperature box will automatically stop heating and give an alarm to ensure the safety of the instrument and chromatographic column;
- Ultra high temperature protection function, the instrument built-in mechanical temperature switch, when the temperature of the heating module exceeds the temperature limit of the temperature switch due to instrument failure or misoperation, the heating power supply will be cut off directly to ensure the safety of the instrument and the environment;
- In case of leakage, the temperature of the column will be stopped automatically to ensure the safety of personnel;
- The external control of chromatographic data workstation through network cable can easily control the instrument and meet the requirements of production and scientific research;
- The Peltier element is used to greatly improve the efficiency of heating and cooling and save time;
- The high integrated STM32 microcontroller and SMD packaging devices reduce the size of the circuit board and the number of devices used, and improve the reliability;
- The chromatographic column preheating pipeline was added to ensure the constant temperature of mobile phase and improve the separation repeatability of chromatographic column.

- Add three modes: Column cooler, Column heater, and Automatic, The cooling control requires a set point of 10 °C below ambient or 4 °C, whichever is greater; The heating control requires a set point of ambient temperature +5 °C (the maximum temperature is 85 °C); The automatic mode includes the above two applications, and the temperature regulation is better at the Test point near the room temperature;
- Chromatographic column switching valve, reversing valve and other flow path accessories can be selected to meet different application requirements;

1.3 Performance index

- Temperature control range (Specific condition) :

Column heater: Ambient temperature +5 °C~85°C;

Column cooler: 4 °C~ Ambient temperature -5 °C;

Automatic: 4~85°C

- Maximum alarm temperature: 90 °C
- Temperature setting resolution: ≤ 0.1 °C
- Accuracy: ≤ 0.1 °C
- Temperature overshoot: ± 0.1 °C
- Communication mode: network port communication
- Pressure limit: 41/120MPa (Depending on valve)

1.4 Physical specifications

- Weight: 23 kg
- Power supply: AC 220 V ($\pm 10\%$), 50 Hz

- Power consumption: 420VA
- Dimension: 600mm×170mm×480mm (Long×Wide×High)

1.5 Introduction to Optional Valves

1.5.1 6-Position, 7-Port

a、OC3230-07S041 model:

Items	Specifications
Material	Stainless Steel
Maximum Pressure	41 MPa
Flow Passage Diameters:	Stator- 0.3-mm (0.012")
Motor Power Requirements	24 VDC ± 5% at 1 Amp max
Maximum Operating Temperature	0°C~50°C
Storage temperature	-20°C~65°C
Size	122.5 mm×49.5 mm×62.0mm

6-Position, 7-Port application attempt:

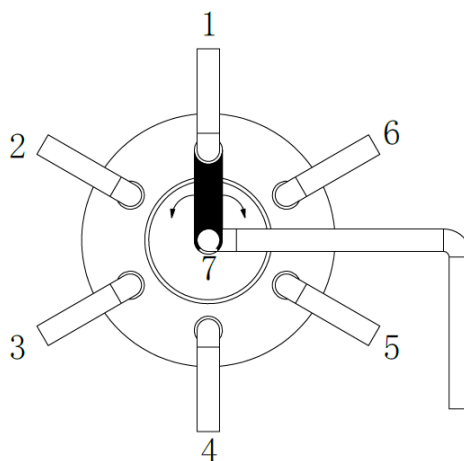


Fig.1-2 Initial valve position

1.5.2 2-Position, 6-Port

a、OC3230-06S041 model:

Items	Specifications
-------	----------------

Material	Stainless Steel
Maximum Pressure	41 MPa
Flow Passage Diameters:	Stator- 0.3-mm (0.012")
Motor Power Requirements	24 VDC \pm 5% at 1 Amp max
Maximum Operating Temperature	0°C~50°C
Storage temperature	-20°C~65°C
Size	122.5 mm \times 49.5 mm \times 61.0mm

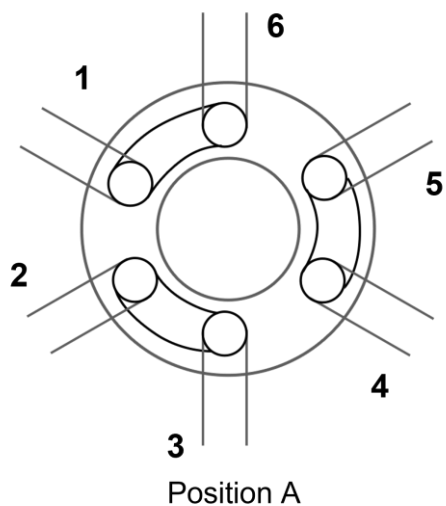
b、OC3230-06S120 model:

Items	Specifications
Material	Stainless Steel
Maximum Pressure	41 MPa
Flow Passage Diameters:	Stator- 0.3-mm (0.012")
Motor Power Requirements	24 VDC \pm 5% at 1 Amp max
Maximum Operating Temperature	0°C~50°C
Storage temperature	-20°C~65°C
Size	122.5 mm \times 49.5 mm \times 61.0mm

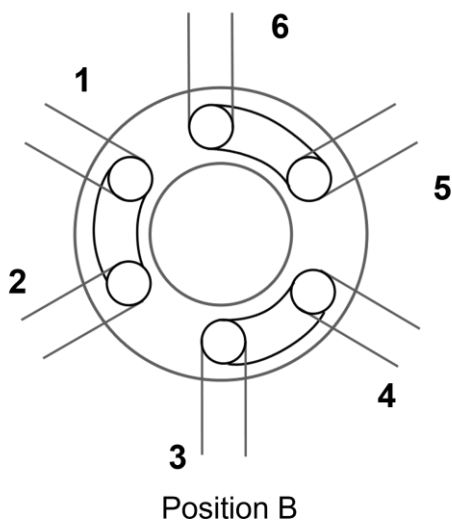
2-Position, 6-Port position and path:

a、OC3230-06S041 model:

(1) **Position A and path:**

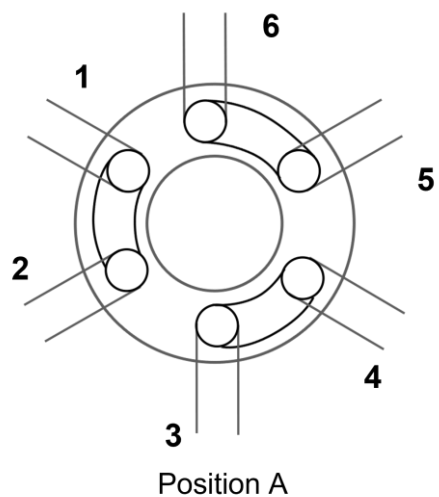


(2) **Position B and path:**



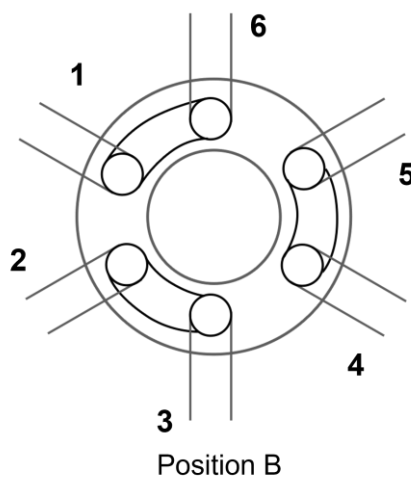
b、OC3230-06S120 model:

(1) **Position A and path:**



(2) **Position B and path:**

[--+



1.5.3 2-Position, 10-Port

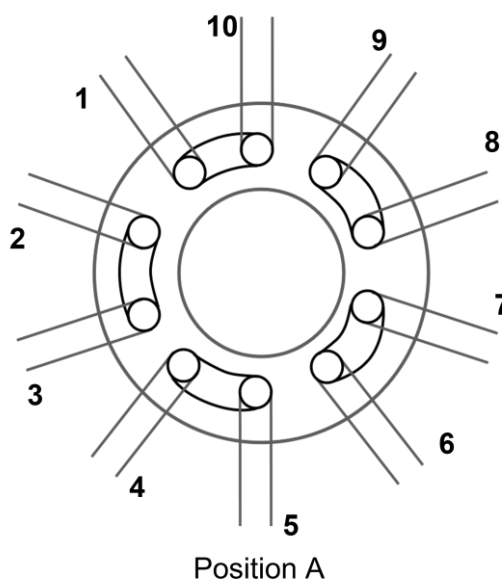
a、OC3230-10S041 model:

Items	Specifications
Material	Stainless Steel
Maximum Pressure	41 MPa
Flow Passage Diameters:	Stator- 0.25-mm (0.010")
Motor Power Requirements	24 VDC \pm 5% at 1 Amp max
Maximum Operating Temperature	0°C~50°C
Storage temperature	-20°C~65°C
Size	122.5 mm×49.5 mm×63.0mm

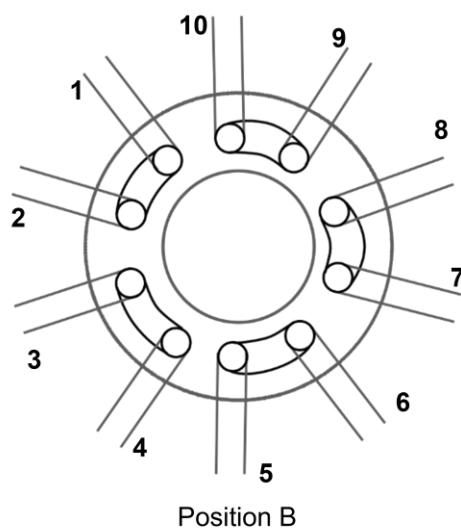
2-Position, 10-Port position and path:

a、OC3230-10S041 model:

(1) Position A and path:



(2) **Position B and path:**



1.6 Configuration valve and application

1.6.1 Column Automatic Switching (6-Position, 7-Port)

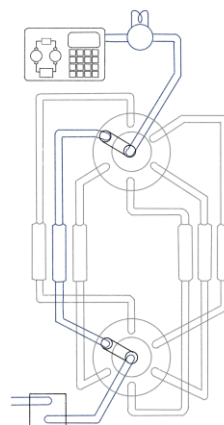


Fig.1-3 Column selection mode

a、OC3230-07S041 model:

Automatic switching of multiple columns is mainly realized by 6-Position, 7-Port

1.6.2 Multidimensional chromatography

Method one adopts a 2-Position, 6-Port with a 2-Position, 10-Port.

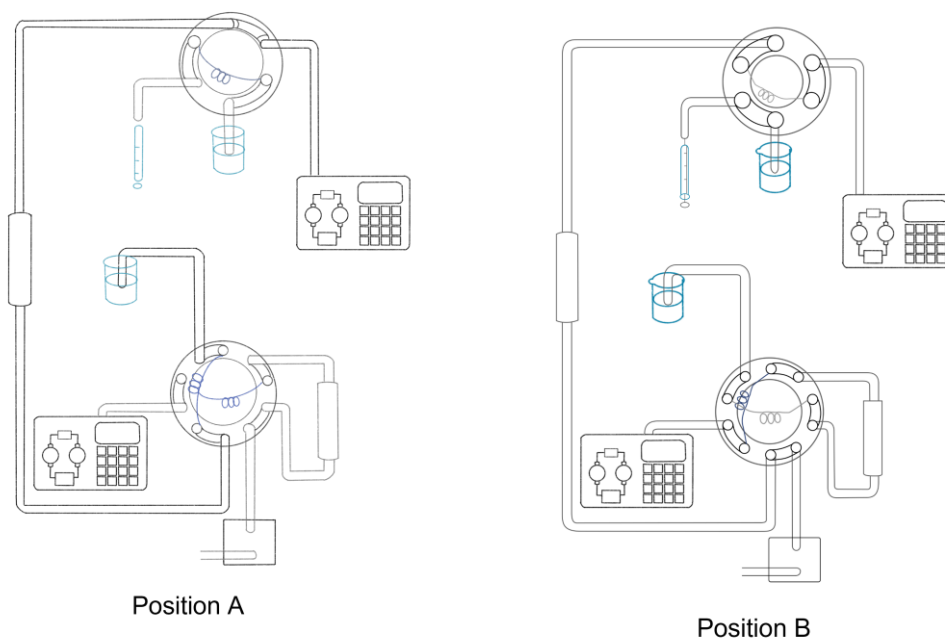


Fig.1-4 Multidimensional chromatography Method 1

Multidimensional chromatography is automated using a 2-Position, 6-Port and a 2-Position, 10-Port for sample delivery to the secondary separation unit. In Position A, pump A is used to transport the sample from column 1 to the retaining ring in the 2-Position, 10-Port, which is then switched. Such as PositionB; In Position B, pump B transports the trapped sample from the trapped ring to column 2, and the valve is switched again, as in Position A; In Position A, pump B was used for the second two-dimensional separation (column 2) and column 1 regeneration to prepare for the next experiment of pump A.

Method two adopts a 2-Position, 10-Port

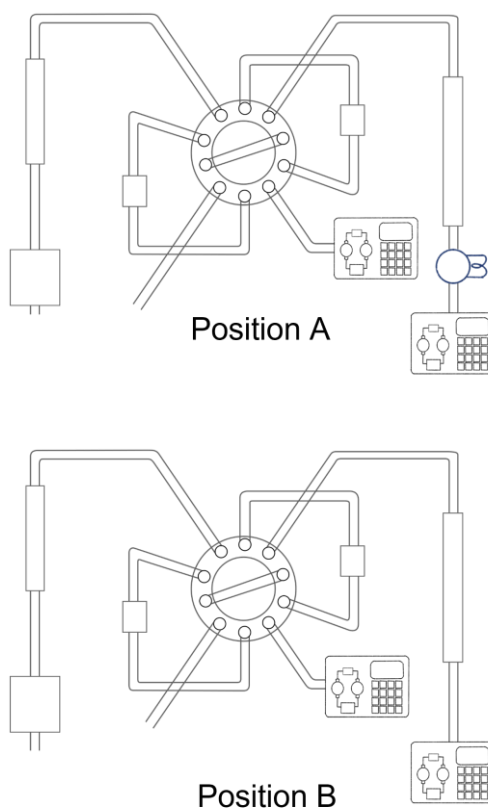


Fig.1-5 Multidimensional chromatography Method 2

In Position A, part of the sample is captured on the reversed-phase trap column 1 after passing through the A-exchange column, while the reversed-phase trap column 2 eluted a part of the sample captured before to another b reversed-phase column for further separation and identification by ESI-MS or MS-MS. In Position B, a exchange column is switched by a valve and connected to reverse trap column 2 to capture new components, while reverse trap column 1 elutes the captured components to the b reverse column for further separation.

1.6.3 Column regeneration (2-Position, 10-Port)

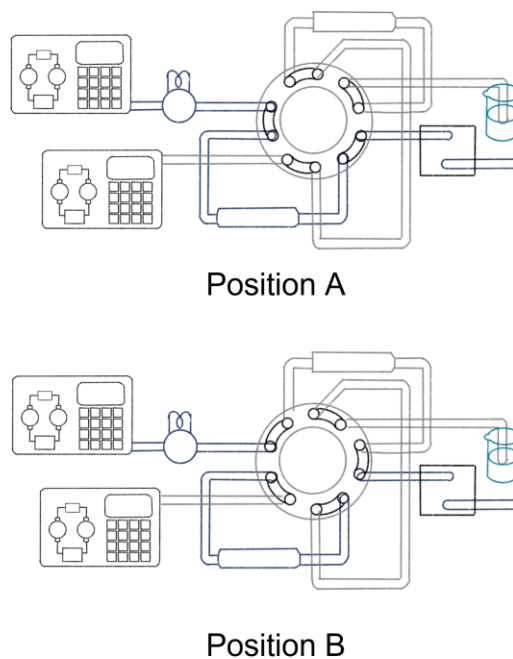
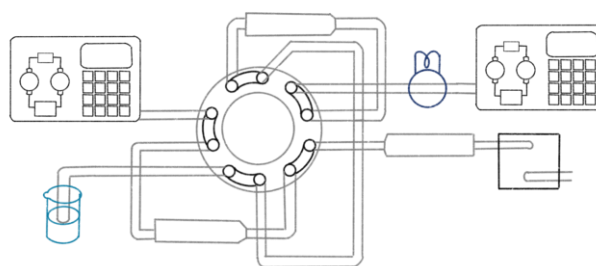


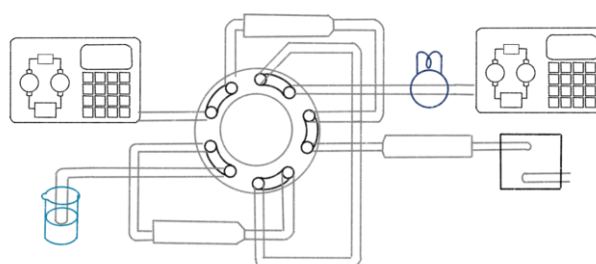
Fig.1-6 Column regeneration

Alternating column regeneration with two matched columns can increase the throughput of sample solution. In this process, one column performs the analysis while the other column performs the balancing operation, thus saving time and this method is particularly useful in gradient elution. A 2-Position, 10-Port was used to switch the two chromatographic columns, as shown in the figure. Position A, column 1 was analyzed, and column 2 was regenerated. Position B, column 2 was analyzed, and column 2 was regenerated. Position B, column 2 was analyzed, and column 1 was regenerated.

1.6.4 On-line SPE (2-Position, 10-Port)



Position A



Position B

Fig.1-7 Online SPE

Application of 2-Position, 10-Port in On-line SPE, Position A, front column 1 receives samples from pump A for cleaning treatment or concentration; At the same time, in front column 2, the previously injected samples that have been removed and concentrated are injected into the analysis column, and then analyzed by the detector. Position B, functional exchange of the two front columns. The substrate is discharged as waste, and the analyte is concentrated and retained to the front column. After switching, the sample retained in the front column is eluted into the analysis column, and then separated by the analysis column into the detector.

1.6.5 Sample injection + Concentration (2-Position, 10-Port)

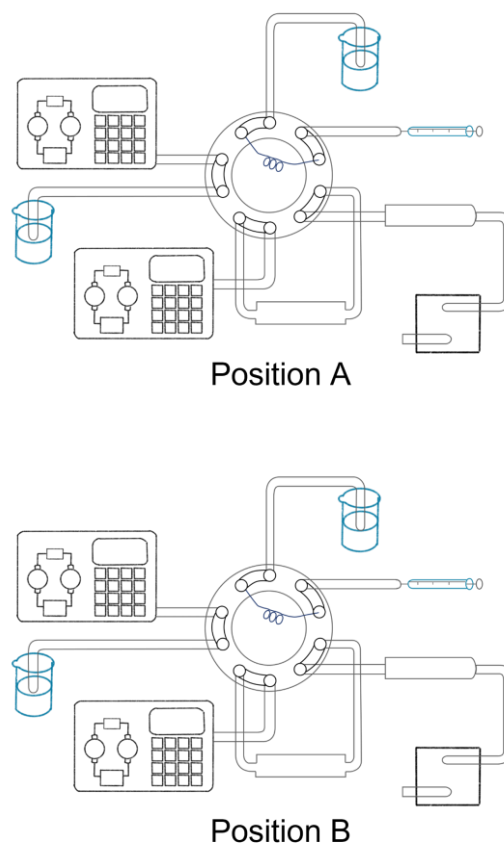


Fig.1-8 Sample injection + Concentration

In the Sample injection + Concentration system, the 2-Position, 10-Port combines the functions of a syringe and an on-off valve. In Position A, the quantitative ring receives the sample solution, while pump B injects the cleaned and concentrated target material in the front column into the analysis column. When all the target material is transported to the analysis column, the valve is switched, such as Position B; In Position B, the mobile phase from pump A is used to inject the samples in the quantitative ring into the front column for cleaning and concentration. Meanwhile, the flow from pump B is used to separate the previous samples in the analysis column and make them enter the detector one by one for analysis.

Chapter 2 Installation and transportation

2.1 Open package inspection and standard accessories

O3230L Column Oven is packed with corrugated box and foam lining. After receiving the instrument, please first check whether the outer package of the instrument is complete and undamaged. If there is any sign of damage to the outer package, please contact Elite or the local distributor in time.



[Warning]

Please do not try to check the condition of the instrument if you receive any sign of instrument damage.

2.1.1 Remove the package

Place the top of the package containing the O3230L Column Oven on the horizontal ground. Cut off the top tape with a wallpaper knife, take out the chromatographic Column Oven with inner package and the accessory package, and place them on the table top. Remove the foam material in turn and open the protective film of the instrument.



[Warning]

Please pay attention to safety during transportation, installation and disassembly, so as to prevent instrument damage or personal injury caused by careless slipping of the instrument.

2.1.2 Packing list

Before installing the O3230L, please check whether there are missing accessories according to the packing list. If one or more of them are missing, please contact Elite or the local distributor as soon as possible.

Tab 2-1 Packing list of O3230L chromatographic Column Oven

NO.	Item	ea.	Qty
1	O3230L Column Oven	pc.	1
2	Operation Manual For O3230L Column Oven (CD)	pc.	1
3	Product certificate	pc.	1
4	After sales service card	pc.	1
5	Startup package	pc.	1



[Note]

In case of any discrepancy between the packing list attached with the case and the instruction manual, the packing list attached with the case shall prevail. Any change is subject to notice.

2.2 Stacking mode

In order to ensure the best working state of the instrument, the user is recommended to place the instrument according to the stacking sequence shown in Fig. 2-1.

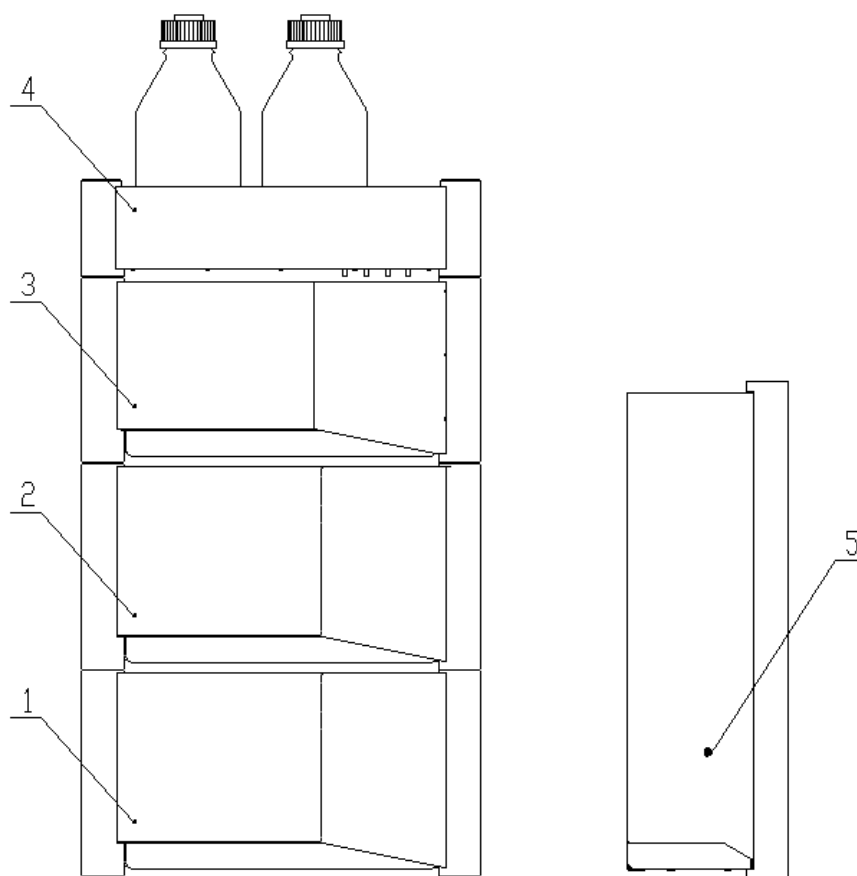


Fig. 2-1 Stacking sequence of Eclassical 3200 HPLC

1. High pressure constant flow pump;
2. Automatic sampler;
3. Detector;
4. Solvent bottle tray;
5. Column Oven

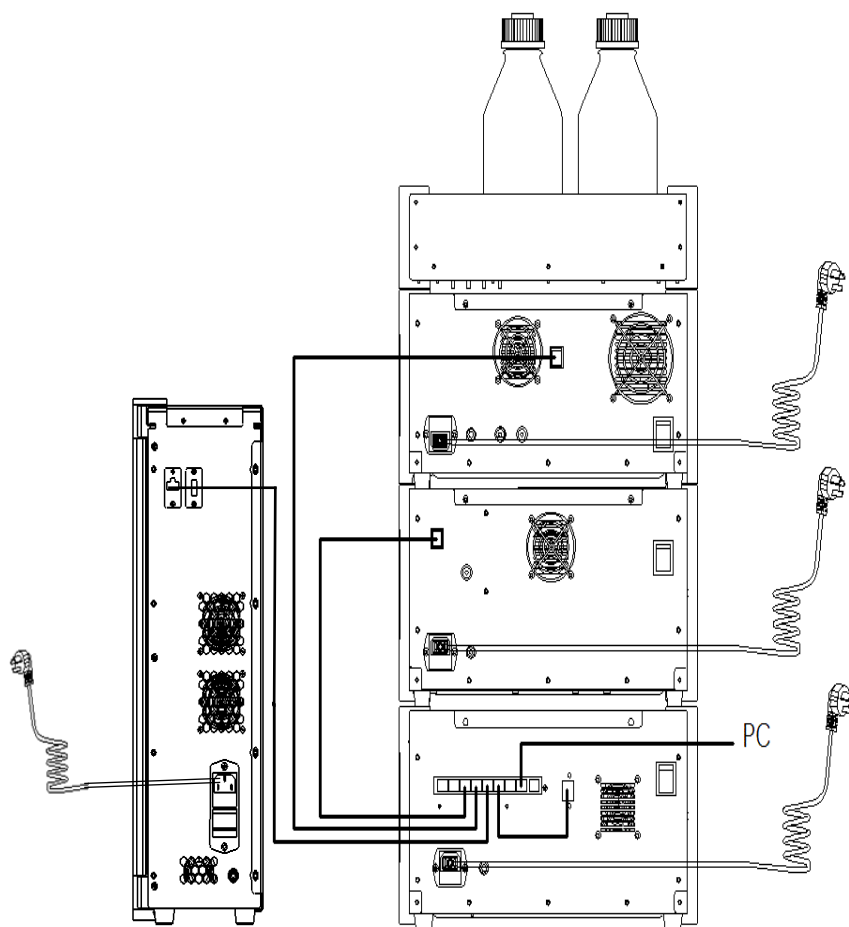


Fig. 2-2 Connection diagram of the back panel of Eclassical 3200 HPLC

2.3 Installation environment requirements

2.3.1 Site requirements

- *Environmental Science*

Refer to Tab.2-2 for operating conditions of the temperature chamber.

It is suggested that the ambient temperature change should be less than 2 °C / h. If the ambient temperature fluctuates greatly, the stability of temperature control may be affected.

Tab.2-2 Environmental requirements

No.	Type	Requirement
1	Indoor environment	Indoor should be clean and dust-free, no flammable and explosive materials, good ventilation
2	Electromagnetic field	There is no electromagnetic noise source nearby
3	Operating temperature range	4°C~40°C
4	Relative humidity	20% ~ 80%, non condensing



[Caution]

If the ambient temperature is too low, please slowly raise the room temperature to avoid condensation inside the instrument due to rapid temperature rise.

- **Workbench**

The location of O3230L Column Oven should be close to computer and detection equipment, and the area required for constant temperature of O3230L Column Oven is 600×160 mm in size and the table top should be stable and level. When placing, reserve at least 5 cm space from the left end of the instrument, at least 10 cm space at the right end, and at least 25 cm space at the back end to ensure the line connection. Ensure no occlusion at the rear end and good air circulation. Too high room temperature will affect the heat dissipation of the O3230L Column Oven, and then affect the cooling effect of the O3230L Column Oven, which may make the O3230L Column Oven fail to reach the refrigeration set value.



[Warning]

The whole set of instruments should be placed in horizontal position, otherwise there is a risk of falling down!

2.3.2 Power cord

In order to ensure the normal and safe operation of the instrument, please use the special power line within the specified voltage range.

- Grounding, AC power supply 220 V \pm 10%, 50 Hz
- Please use T5AL250V fuse



[Warning]

- ◆ Please use the special power cord provided by alite. If you choose other brand or unknown power cord, it may cause damage to electronic components or personal injury!
- ◆ If the instrument is connected to the power grid higher than the applicable range, personnel may be shocked or the instrument may be damaged!
- ◆ Please unplug the power cord of chromatographic Column Oven first, and then replace the fuse to avoid electric shock accident.
- ◆ For the sake of personal safety and instrument protection, an external fuse is installed at the rear of the instrument.

2.3.3 Computer requirements

Hardware requirements

- Minimum hardware requirements: Intel Core 2 CPU, 8G memory (PDA module requires 16G memory or above), C drive 4G or above, Kromstation installation path data storage space, reserved based on customer actual experimental volume, recommended 50G or above.
- Minimum display resolution: 1024×800, 64K color (16 bit true color).
- Others: USB interface for data transmission and CD-ROM drive for software installation.

Operating system requirements

- Windows 10 and above (eg Windows 10, Windows 11) , 64-bit..
- Confirm that the operating system used to run Kromstation workstation is genuine.
- Make sure that the firewall of the operating system is turned off.
- Set the "put the computer to sleep" option in the operating system to "never".
- Set the properties of the network adapter and make sure that "allow the computer to turn off this device to save power" in the power management option of the network adapter is not selected.
- It is not recommended to install anti-virus software on the computer used to connect to EClassical 3200L high performance liquid chromatograph, and it is necessary to ensure that the mobile storage device used for data copy is free from any computer virus.

2.4 The rear panel is connected to the instrument

The rear panel of O3230L is shown in the Fig.2-3 and Fig.2-4. The settings and their corresponding functions are shown in Tab.2-3 and Tab.2-4.

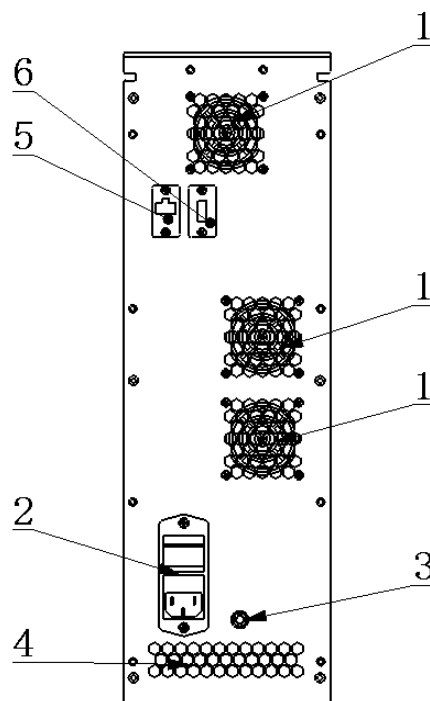


Fig. 2-4 Schematic diagram of back panel of O3230L

Tab.2-4 Rear panel settings and functions

NO.	Component	Function
1	Instrument cooling fan	It is used for heat dissipation of instrument.
2	Power switch assembly	Instrument power switch and power cord socket.see Fig 2-4 and Tab 2-4
3	Terminal grounding	Ground connection terminal is used for instrument grounding.
4	Cooling outlet of switching power supply	Fuse (T5AL250V) containing the instrument.
5	Lan-2 network cable interface	This interface is connected with P3200L high pressure constant flow pump interface through network cable for external control.
6	Type-B	

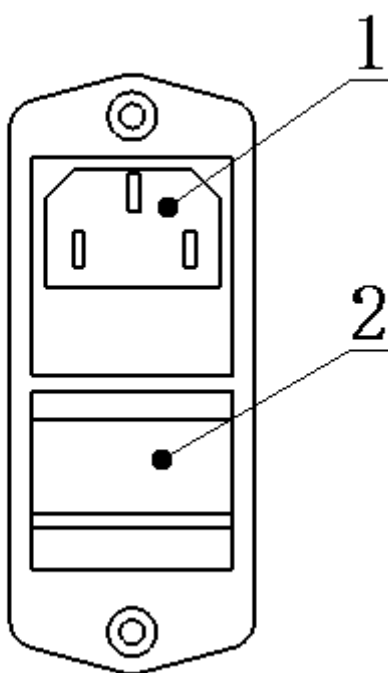


Fig. 2-5 Power switch assembly

Tab.2-5 Power switch assembly settings and functions

NO.	Name	Function
1	Main power socket	For instrument power supply
2	Power switch	Main power switch

2.5 Installation of Chromatographic Column Pipeline System

2.5.1 Column installation position

The installation position of O3230L Column Oven is as follows Fig. 2-6.

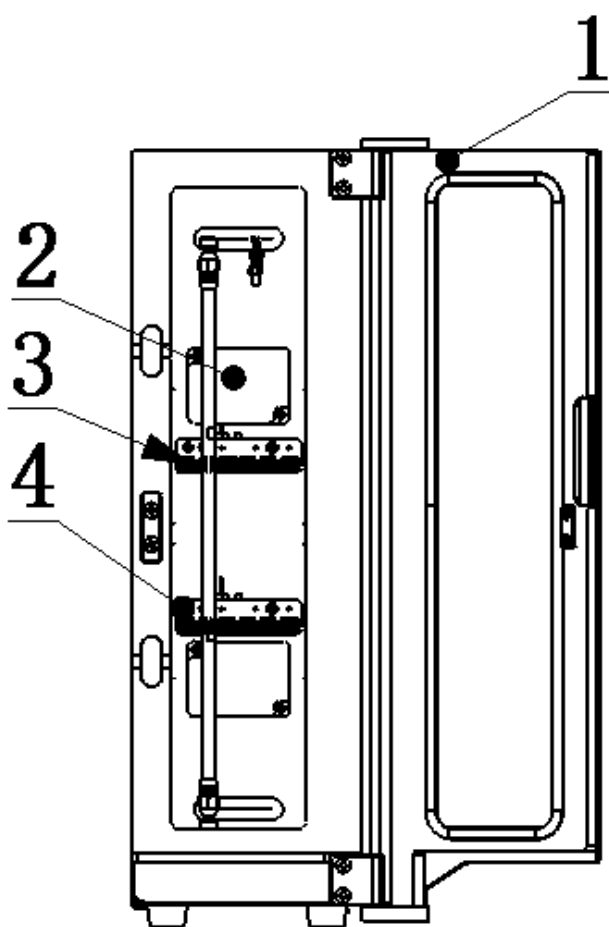


Fig.2-6 chromatographic column installation location

Tab 2-6. Component name and function of chromatographic column

NO.	Name	Function
1	Front door of chromatographic Column Oven	It is used to close the heating chamber.
2	Heat conduction positioning plate	Preheat the liquid.
3	Chromatographic column clamp	Used to fix chromatographic column.
4	Column clamp mounting frame	The column clamp is used to place the chromatographic column

2.5.2 Chromatographic column pipeline connection

- 5) Use stainless steel (or PEEK) pipe to connect the preheating tube inlet and the injector.
- 6) Use stainless steel (or PEEK) pipeline to connect the preheating tube outlet and chromatographic column.
- 7) Connect the column to the detector with stainless steel (or PEEK) pipeline.
- 8) Place the connected chromatographic column in the chromatographic column clamp, adjust it to the appropriate position, and place the pipeline in the front and rear pipeline outlet.
- 9) Run the high pressure constant flow pump and make sure that there is no leakage at each connection.
- 10) Cover the side cover and complete the pipeline connection

2.5.3 Chromatographic column connection with protective column

If it is necessary to connect the protective column in front of the chromatographic column, the protective column can be placed under the installation block near the inlet end. If the direct connected protective column is used, the total length of the chromatographic column plus protective column shall be less than 310mm.



[Note]

In order to ensure good column efficiency and separation effect, the thinner the inner diameter of the pipeline used to connect the chromatographic column is the better, and the shorter the length, the better.



[Warning]

Some commonly used mobile phase solvents are flammable, explosive and toxic. Therefore, it is necessary to be very careful in the connection of chromatographic column. Once the liquid leaks from the connection head of chromatographic column, it must be removed in time.

2.6 Transport

Chromatographic Column Oven is a kind of precision instrument. When it is transported for a long distance, please handle it with care. Violent vibration and drop may damage the internal parts of the instrument. The random original packaging provided by Elite can effectively cushion the physical vibration of electronic parts and mechanical parts, so that the instrument can get the best protection.

When the instrument needs to be transported or returned to the factory for maintenance, please follow the following steps for packaging.

- 1) Turn off all instrument power.
- 2) Unplug the instrument power cord and communication cable.
- 3) Remove the connecting pipeline between the chromatographic Column Oven and other unit components of the chromatograph.
- 4) Take the chromatographic Column Oven out of the chromatographic system carefully, place it on a wide platform and put it into a special sealing bag.
- 5) Put the original packaging foam into the frame of chromatographic Column Oven and fix it.
- 6) Carefully put the fixed chromatographic Column Oven into the original packing box, and put other accessories together according to the delivery list.
- 7) Seal the mouth of the packing box with adhesive tape. In order to

prevent liquid from entering, it is recommended to cover the sealed box with a layer of fresh-keeping film.

- 8) Transport the packed instruments.



[Warning]

If the package has been damaged, please contact the local customer service personnel!

Chapter 3 basic operation

3.1 Power on

- 1) Connect the power supply and plug the power cord into the power socket. Note that the power switch should be off (i.e. "O") at this time (on the back panel, "I" is marked as power on and "O" is marked as power off).
- 2) Press the power switch.
- 3) At this time, the power indicator light flashes, O3230L starts self-test, and the indicator light is always on after the O3230L self-test is passed. At this time, you can view the status of O3230L the actual temperature value and the set temperature value in the device monitoring window of the workstation. The default unit is °C.



[Note]

There is a long strip-shaped indicator light under the front panel of O3230L series high-pressure constant flow pump, which is both a power indicator and a status indicator, as shown in Figure

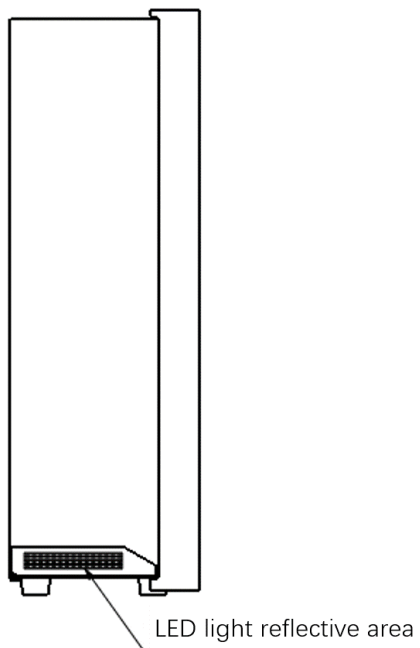


Fig.3-1 Column oven front panel diagram



[Note] The indicator light can directly indicate that the instrument is in power supply or sleep state and fault alarm prompt. See Fig. 3-2 for the specific status and significance of the indicator light.

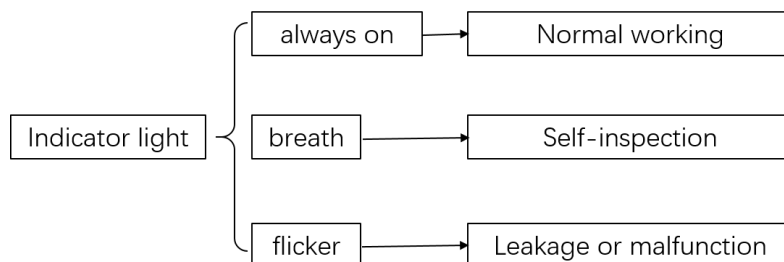


Fig.3-2 Status and significance of indicator light



[Note] If it is the first time to use the O3230L Column Oven, the parameters in the main interface are the default parameters of the O3231 chromatographic Column Oven after power on and self-test, otherwise, the O3230L chromatographic Column Oven will maintain all the parameters before shutdown after the previous use.



[Note] The temperature setting range of O3230L Column Oven will change with the setting of alarm temperature, and the maximum input range is 4°C ~ 85 °C.



[Note] The setting of alarm temperature should consider the maximum temperature that the chromatographic column can bear.



[Note] If the chromatographic Column Oven is in alarm state, please check whether the alarm temperature is set too low, such as near or

below room temperature. If the chromatographic Column Oven alarm caused by non-human factors repeatedly occurs, please contact our customer service personnel.



[Note]

The temperature of O3230L Column Oven has been calibrated before delivery. It is not recommended that customers calibrate the temperature at normal room temperature (20°C~ 30 °C). If it is necessary to calibrate the temperature, please record and backup the original temperature calibration value.

3.2 Function

The temperature rising function of O3230L is mainly controlled by Kromstation workstation. In the instrument method of chromatographic data workstation, the column temperature and alarm temperature required for the experiment are set. After other instrument parameters in the method are set, save the method and run the method. At this time, the column temperature box will operate according to the temperature set by the method, The alarm and temperature can be seen in the monitoring window.

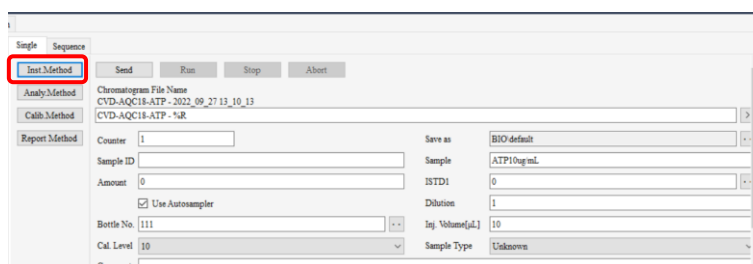


Fig.3-3 Interface for instrument method setting of Kromstation

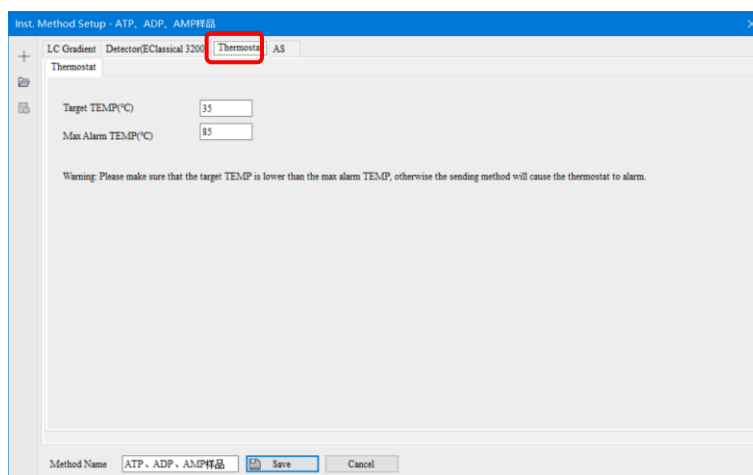


Fig.3-4 Column temperature setting interface of Kromstation

Chapter 4 Routine maintenance

4.1 Precautions for use

Under normal conditions, the chromatographic Column Oven does not need too much maintenance in the process of use. In order to ensure the use effect of chromatographic Column Oven and the repeatability of the experiment, please pay attention to the following points:

- 1) During operation, the front door of chromatographic column temperature box should be closed tightly, otherwise the time to reach the set temperature value is too long or the actual temperature value fluctuates greatly.
- 2) Keep the components of chromatographic Column Oven clean. If the chromatographic column leaks liquid, it should be cleaned up in time, especially when using flammable and explosive hazardous solvents as mobile phase. In addition to cleaning up the leaked liquid in time, all instrument positions should be well ventilated.
- 3) When replacing chromatographic column, it is better to cut off power for safety.

4.2 Fuse replacement

- 1) Turn off the power switch.
- 2) Remove the power cable from the power outlet.
- 3) Referring to Fig.2-5, open the fuse back cover with a screwdriver.
- 4) After replacing the new fuse, push on the fuse box cover.



[Note]

Fuse model: T5AL250V

Chapter 5 Parts and materials list

5.1 Consumable parts

NO.	Describe	Stock code
1	3/16"-32 SS Nut	14510027
2	1/16"SS Ferrule	14990070
3	1/16"SS Union	14990115
4	SS Tubing OD1/16"~ID0.007"	12010005
5	Finger Tight I	3215F-120X
6	Silicone Tubing OD9.0 mm × ID6.0 mm	13010119
7	Power Cable	17000119
8	Twist-Pair	17000116
9	T5AL250V Fuse	15080017
10	Cloumn Clip φ 7	14990850
11	Cloumn Clip φ 10	14990851
12	Cloumn Clip φ 13	14990852

5.2 Options

6-Position, 7-Port Options (OC3230-07S041)

NO.	Describe	Qty	Units	P/N
1	6-position, 7-port OC3230-07S041	1	ea	3215MHP7970-500-4
2	1/16" SS Ferrule	11	ea	14990070
3	3/16"-32 SS Nut	11	ea	14510027
4	Finger Tight I	0.9	ea	3215F-120X
5	OD1/16"~ID0.007" (400mm each) SS Tubing	2.8	m	12010005
6	SS Union	4	ea	14990115
7	Valve support	1	ea	14080270
8	Valve seat	1	ea	14080271
9	Drip tray	1	ea	14080303
10	SS Pagoda Connector	1	ea	14996321
11	Valve Accessories	1	ea	18050042
12	Silicone Tubing OD9.0mm*ID6.0mm	1	m	13010119

2-Position, 6-Port Options (OC3230-06S041)

NO.	Describe	Qty	Units	P/N
1	2-position, 6-port OC3230-06S041	1	ea	3202MHP7900-500-1
2	1/16" SS Ferrule	10	ea	14990070
3	3/16"-32 SS Nut	10	ea	14510027
4	Finger Tight I	0.8	ea	3215F-120X
5	OD1/16"~ID0.007" (400mm each) SS Tubing	2.4	m	12010005
6	SS Union	6	ea	14990115
7	Valve support	1	ea	14080270
8	Valve seat	1	ea	14080271
9	Drip tray	1	ea	14080303
10	SS Pagoda Connector	1	ea	14996321
11	Valve Accessories	1	ea	18050042
12	Silicone Tubing OD9.0mm*ID6.0mm	1	m	13010119

2-Position, 6-Port Options (OC3230-06S120)

NO.	Describe	Qty	Units	P/N
1	2-position, 6-port OC3230-06S120	1	ea	3215HT718-000
2	1/16" SS Ferrule	10	ea	14990070
3	3/16"-32 SS Nut	10	ea	14510027
4	OD1/16"~ID0.007" (400mm each) SS Tubing	2.4	m	12010005
5	SS Union	6	ea	14990115
6	Valve support	1	ea	14080270
7	Valve seat	1	ea	14080271
8	Drip tray	1	ea	14080303
9	SS Pagoda Connector	1	ea	14996321
10	Valve Accessories	1	ea	18050042
11	Silicone Tubing	1	m	13010119
12	Circuit Board	1	ea	32028382-108

2-Position, 10-Port Options (OC3230-10S041)

NO.	Describe	Qty	Units	P/N
1	2-position, 10-port OC3230-10S041	1	ea	32027960-500-1
2	1/16" SS Ferrule	14	ea	14990070
3	3/16"-32 SS Nut	14	ea	14510027
4	Finger Tight I	1.2	ea	3215F-120X
5	OD1/16"~ID0.007" (400mm each) SS Tubing	4	m	12010005
6	SS Union	5	ea	14990115
7	Valve support	1	ea	14080270
8	Valve seat	1	ea	14080271
9	Drip tray	1	ea	14080303
10	SS Pagoda Connector	1	ea	14996321
11	Valve Accessories	1	ea	18050042
12	Silicone Tubing OD9.0mm*ID6.0mm	1	m	13010119

Appendix

Brief introduction of connecting pipe material

In the liquid chromatography system, the column system, pipelines, connectors, and the volume outside the column of the injector and detector may cause the peak broadening. The unsuitable selection of pipeline material will lead to the broadening of spectral band and even the denaturation of samples, which will directly affect the reliability of the analysis results. Good pipeline connection can give full play to the function of the instrument and improve the working efficiency.

According to the difference of pressure, mobile phase and sample properties, different materials should be used in liquid chromatography. Commonly used pipeline materials include stainless steel, peek, polytetrafluoroethylene, polyvinylidene fluoride, polyethylene or polypropylene, of which stainless steel pipe is the most commonly used.

The outer diameter of the liquid chromatography connecting tube is 1 / 16 "(1.59mm) except for the front and back of the column. The inner diameter can be selected according to the needs. The commonly used sizes are 0.007" (0.175mm), 0.01 "(0.25mm), 0.02" (0.5mm), 0.03 "(0.75mm) and 0.04" (1.0mm).

Stainless steel pipe is generally used for parts with high pressure. In liquid chromatography system, the part from pump outlet to column inlet belongs to high pressure section, so stainless steel tube is recommended. The stainless steel pipe has good corrosion resistance and precise coaxiality. The matching of pipe hole and joint hole should be paid attention to when selecting.

Polymer tube can be used in other low pressure parts of liquid chromatography system, such as liquid storage bottle, pump, detector outlet, injector discharge port and vent valve outlet. Polytetrafluoro-Ethylene (PTFE) is the most commonly used plastic junction tube because it is inert to the chemical reagents in liquid chromatography.

PEEK tube is more inert than stainless steel tube when the pressure is below 20MPa, which is suitable for the analysis of biological samples.


Security Information

- *General safety information*

The following general safety precautions must be followed at all stages of instrument operation, maintenance and repair. Failure to follow the special warnings in other places in this manual will violate the safety standards for the design, manufacture and use of the instrument. Alitek will not be responsible for the loss caused by the user's failure to comply with these requirements.

- *Safety standards*

The instrument is class I safety equipment (i.e. providing protective grounding terminal), and is manufactured and tested according to national safety standards.

sign	explain
	For the equipment marked with this mark, the user should refer to the instruction manual to avoid injury to the operator and damage to the instrument.
[warning]	Warn you of situations that may cause injury or death. Do not operate beyond the warning range unless you have fully understood and met the required conditions.
[be careful]	You are warned that data loss or equipment damage may occur. Do not operate beyond the scope of care unless you have fully understood and met the required conditions.
[note]	Remind you that the experimental data may not be ideal or the instrument can not work normally, unless you have fully understood and met the required conditions, do not operate beyond the scope of attention.

ELITEHPLC

About Elite

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