

**XINSHENG Pharmaceutical Instrument Co.,Ltd**

# **XSID50 DYNAMIC AXIAL COMPRESSION**

**PROJECT SOLUTIONS**



## Preface

Thank you for using our 50 dynamic axial compression chromatography columns.

Please read this manual carefully before installation and use. If you do not comply with the instructions in this manual and cause losses, we will not be liable. If you have any questions, please contact us.

We will solve your problem in a timely and enthusiastic manner.

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Notes:

XSID50 dynamic axial compression chromatography column is described in detail in this manual.

If the illustrations in this manual are different from the actual product, the actual product shall prevail.

If you find any omission in this manual, please contact us.

# Catalog

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## **1) Equipment using need to know**

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### **1.1 Using environment**

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**1.1.1** Air temperature: within the range of 10-40°C.

**1.1.2** Humidity: relative humidity in the range of 40%-85%, and the principle of humidity change is that it should not cause condensation.

**1.1.3** Environment: well ventilated, clean, and the floor should be kept dry.

**1.1.4** The installation location is far away from vibration source and fire source.

**1.1.5** There should be enough space at the equipment installation to meet the needs of packing and unpacking, and there is enough space for equipment maintenance.

### **1.2 Users need to know**

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**1.2.1** The operator should be a person who has been trained by our company, you must read this manual thoroughly before using the equipment.

**1.2.2** Should be familiar with the main switch of the gas source, so that in case of an accident, the air source can be cut off in time.

**1.2.3** When multiple people operate, they should pay attention to mutual coordination.

### **1.3 Other matters**

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**1.3.1** Please place this manual near the equipment and keep it properly.

**1.3.2** Use recommended hydraulic oil or approved equivalent oil.

**1.3.3** Confirmation of the system before it is run.

## **2) Chromatography Column**

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### **2.1 Introduction**

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Dynamic axial compression technology is column packing, maintain column pressure, column unpacking, through the movement of a piston. the periphery of the piston is equipped with a specially designed sealing structure, which can allow the piston to slide freely along the inner wall of the column tube, the same time into and can maintain a high sealing pressure. The piston movement and pressure maintenance depend on the hydraulic system. Hydraulic power is more stable than conventional spring-powered axial compression columns, more uniform, making the separation column more effective for use, It is possible to load very large diameter preparative column while maintaining comparable separation to analytical columns. It is widely used in natural plant extraction, drug synthesis, separation and preparation of proteins and peptides, and is also a necessary means for the modernization of Traditional Chinese medicine.

## **2.2 Product features**

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**2.2.1 Safe and reliable**

**2.2.2 Easy to operate**

**2.2.3 High efficiency of column, good repeatability, stability and durability**

**2.2.4 Humanized design**

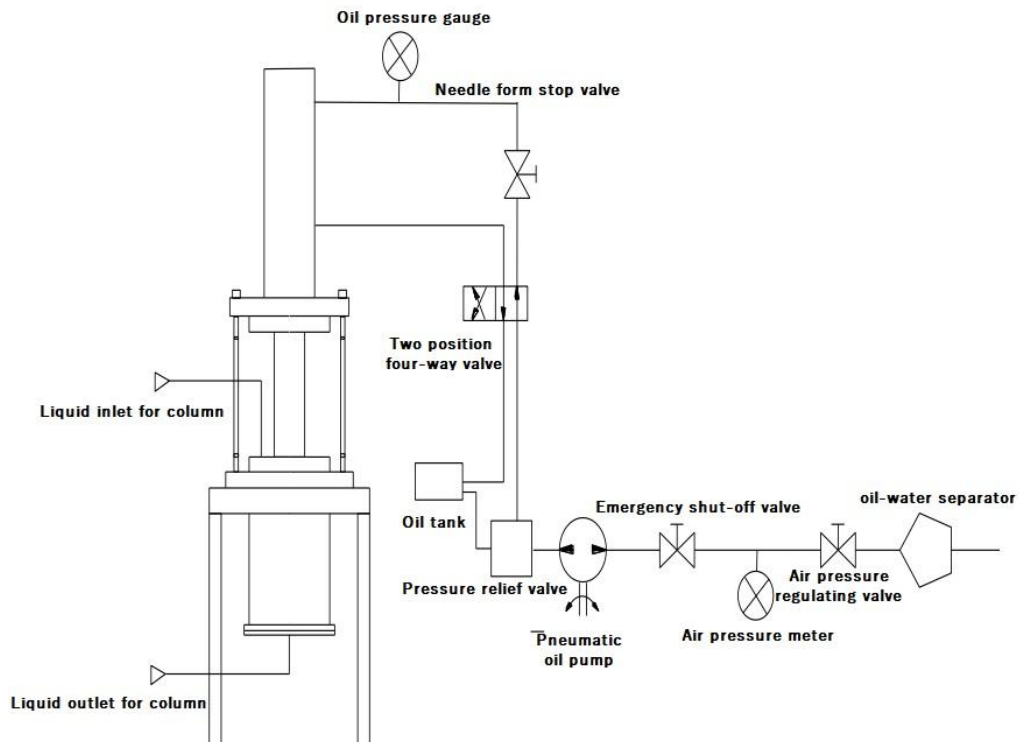
**2.2.5 Cost effective**

**2.2.6 Wide application range**

**2.2.7 Perfect after-sales service**

## 2.3 Equipment composition and working principle diagram

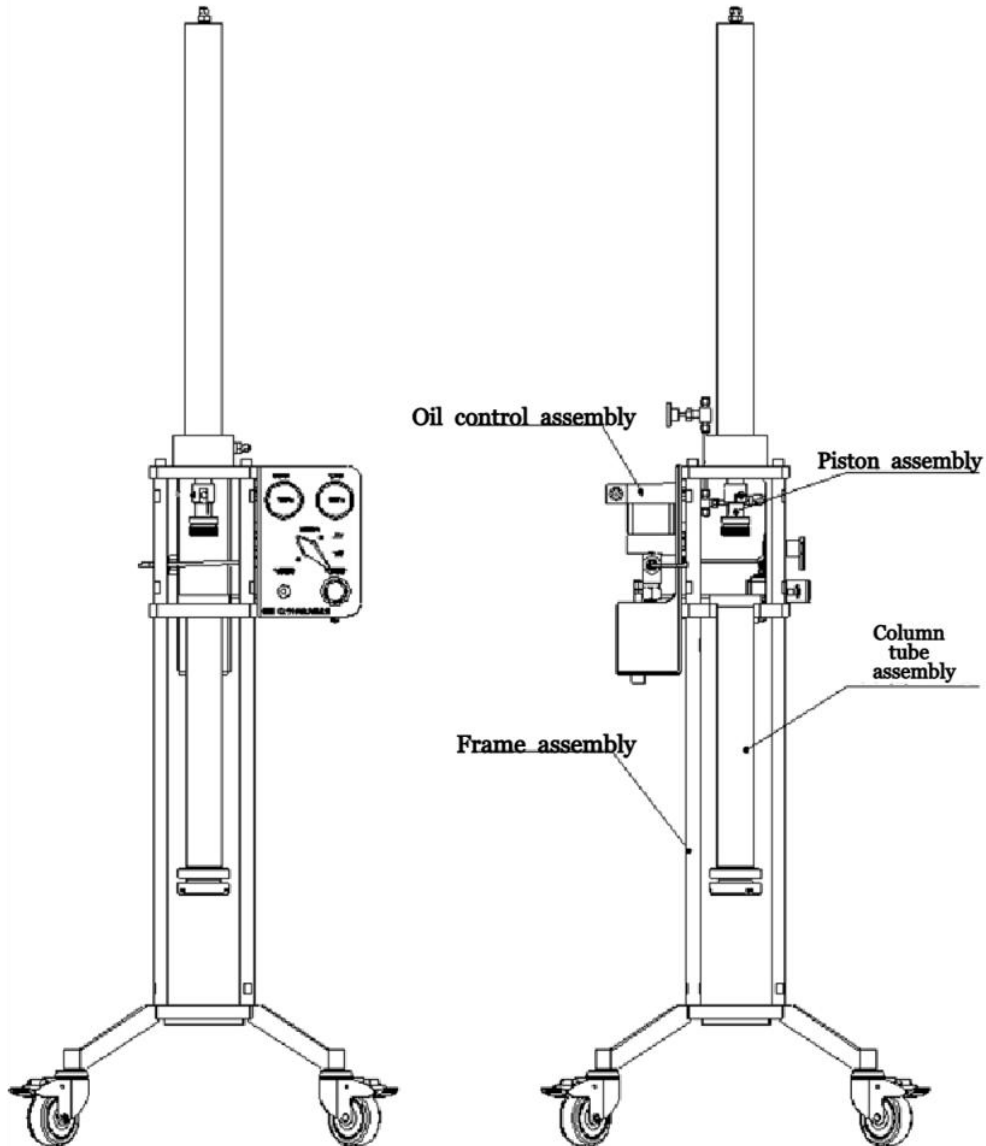
2.3.1 The following is a schematic diagram of the working principle of 50mm diameter DAC chromatography column:



The whole chromatography column system drives the oil pump through the air source to work, control the up and down movement of the hydraulic cylinder through the two position four-way valve, This drives the piston to move up and down.

### 2.3.2 Equipment structure

ID50 dynamic column is mainly composed of rack assembly, control assembly, column tube assembly and piston assembly.





Common consumables:

Serial number	Figure number /specification	Name	Texture of material	Note
1	X.S.ID50.0102	ID50 Piston screen sieve plate	316L	
2	X.S.ID50.0103	ID50 Piston sieve plate sealing ring	F4	
3	X.S.ID50.0105	ID50 Piston guide bush	F4	
4	HR-44-5-1	ID50 High pressure sealing ring	316L/F4	
5	X.S.ID50.0203	ID50 Column bottom seal	F4	
6	X.S.TY.001	Analysis tube cap	F4	
7	X.S.TY.002	Analysis of PEEK nails	PEEK	
8	X.S.TY.003	Analysis of pressure ring	316L	
9	X.S.TY.004	1-16 Analysis hollow screw	316L	
10	X.S.TY.005	1-16 to 1-16 stainless steel two-way pipeline	316L	

### 3) Chromatography column installation

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#### 3.1 Working Environment

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Air source: Air pressure  $\geq 0.4$ MPa

Air piping: 8mm diameter

Ambient temperature: Room temperature

Ambient humidity: 20%-80%

#### 3.2 Assembly of hydraulic cylinder

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Installation steps:

**3.2.1** After unpacking, put the hydraulic cylinder on the top plate of the rack, ensure that the hole positions coincide;

**3.2.2** Secure with a 6-M8\*50 inner hexagon screw;

**3.2.3** Connect the hydraulic cylinder with the change-over valve with oil pipe

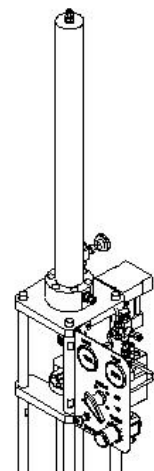
**3.2.4** Pour 46# anti-wear hydraulic oil into the oil tank, connect the air source to make the piston rod of the hydraulic cylinder walk repeatedly for more than 3 times, then hydraulic cylinder exhaust.

#### Matters needing attention:

**A:** Check the surface of each part for scratches, damage and cracks.

**B:** The installed parts are required to be upright and flat.

**C:** Ensure that all parts are firmly connected.



### **3.3 Assembly of column tube**

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Installation steps:

**3.3.1** Check whether the appearance of all parts is intact, Place the column tube on the rack, note: column tube into the piston with the mouth end facing down.

**3.3.2** The installed column bottom flange and sieve plate are placed on the lower end of the column pipe, align with the flange hole of the column tube, Pre-install two M8 \* 25 hexagon socket screws and connect them;

**3.3.3** Turn the oil line reversing valve to the downward working state, open the air pressure regulating valve, Lower the hydraulic cylinder piston rod until it is close to the bottom flange of the column, adjust the air to the minimum, after the piston rod contacts the flange at the bottom of the column, increase the hydraulic pressure to 3Mpa, stop and tighten the screws.

**3.3.4** After tightening diagonally, pull the oil circuit reversing valve to the upward working state, upward movement of the piston rod.

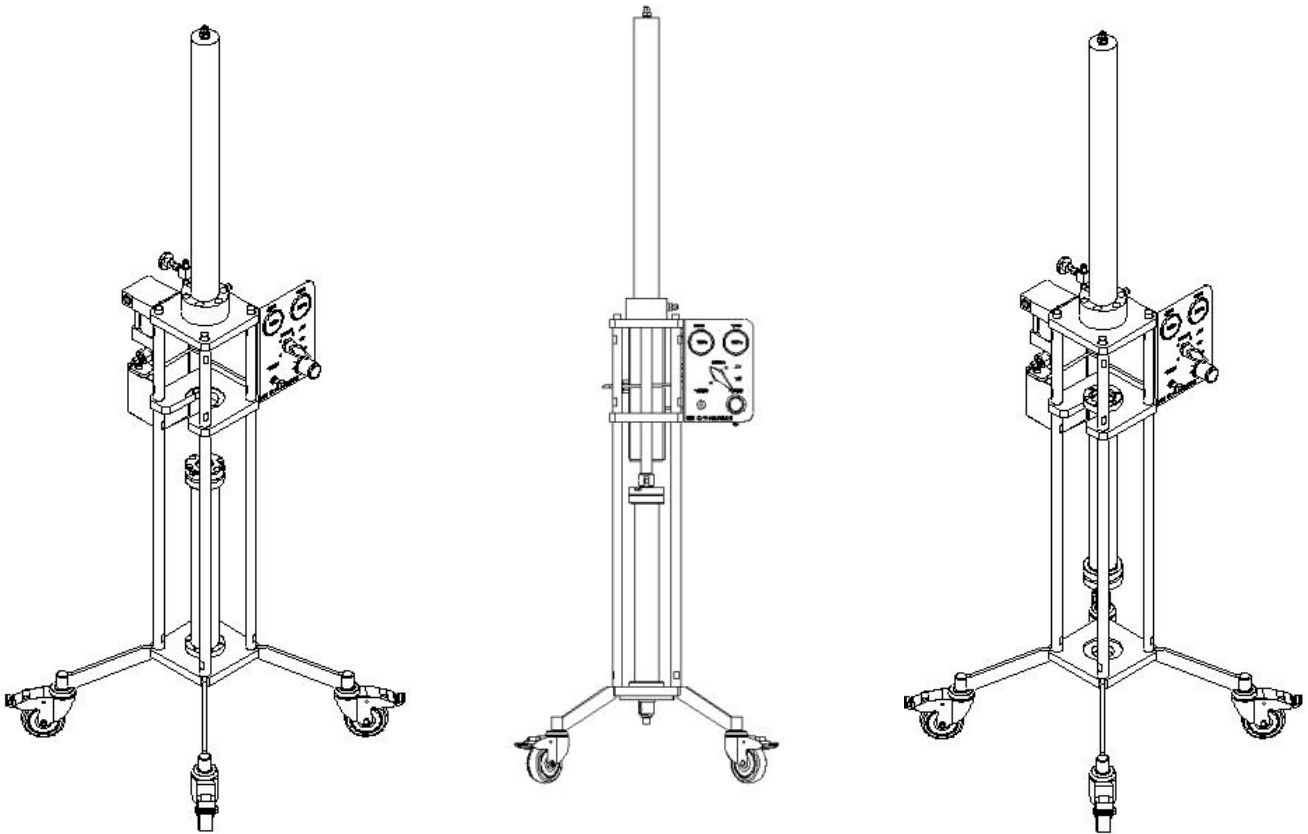
**3.3.5** Remove the installed column pipe, turn it over 180 and install it on the column pipe again.

**Matters need attention:**

**A:** Check the appearance of all parts for scratches and damage.

**B:** Whether the column bottom flange is horizontal when the piston rod presses the column bottom flange.

**C:** Do not tighten the screws too tightly.



### **3.4 Assembly of piston**

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#### **Installation steps:**

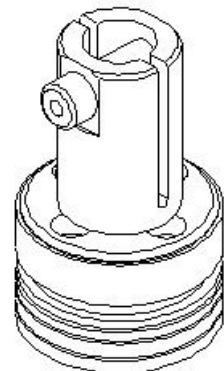
**3.4.1** Check whether the appearance of each part is intact and clean.

**3.4.2** First, put the piston sieve plate into the sealing ring of the piston sieve plate, then screw the sieve plate sealing ring into the piston.

**3.4.3** Install the high-pressure seal, guide sleeve and piston pressing plate into the rear piston in turn, fasten with 4-m6 \* 12 socket head cap screws.

**3.4.4** Tighten the 1 / 16 PEEK pipe with hollow screw and pressure, no leakage of liquid.

**3.4.5** Thread PEEK pipe out of the piston connecting rod for standby, and then connect it to the piston.



#### **Matters needing attention:**

**A:** Clean piston parts before assembly.

**B:** Check the surface of each part for scratches, damage and cracks.

**C:** The installed parts are required to be upright and flat.

**D:** Ensure that all parts are firmly connected.

**E:** Connect the piston component to the hydraulic cylinder, spare.

## **4) Chromatography column packing**

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### **4.1 Preparation before column packing**

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Ensure that the sieve plate, column tube are clean, no water.

### **4.2 Slurring**

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**4.2.1** Calculate the weight of packing material ( $\pi r^2 h$ ) according to the ID of column and the height of column packing, Methanol or isopropanol was used as Slurring liquid, the required amount can be adjusted according to different packing materials.

**4.2.2** Pour the slurring liquid slowly along the inner wall of the container into the container that has been with packing material , Try to avoid touching the packing material and causing dust to fly. stir while pouring the slurring liquid, make the mixture until the slurring liquid is poured all the way in.

**4.2.3** Put into the ultrasonic shaker for degassing, it should be stirred continuously during this period

### **4.3 Column packing**

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**4.3.1** Switch the two position three-way switching valve to the upper end of the column pipe and connect with the liquid outlet, The discharge liquid pipe is fixed in the waste liquid bottle.

**4.3.2** Quickly pour the Slurring liquid into the column tube and start column packing.

**4.3.3** When the piston runs downward and the discharge liquid pipe starts to discharge liquid, continue to operate for 3-5 seconds and press the off switch.

**4.3.4** Quickly switch the two position three-way switching valve, connect the lower end of the discharge liquid pipe with the liquid discharge port, then turn on the emergency stop switch, and the piston continues to go down until it no longer moves and the liquid no longer flows out.

**4.3.5** Resting phase: Maintain the column packing pressure and let it rest for about 20 minutes.

#### **Matters need attention:**

**A:**The packing process of chromatography columns needs to be done carefully and conscientiously, any mistake will cause the failure of column packing.

**B:** Before packing, the column tube should be thoroughly cleaned with an appropriate solvent.

**C:** Because of the different nature of different packing materials, the specific packing process is also different. The specific conditions for column packing column should be changed accordingly to the selected packing materials. In the process of process exploration, the piston pressure should increase from small to large. too much piston pressure will damage the packing material.

**D:** The sealing ring on the piston is a consumable, Its service life is related to the user's packing frequency and The packing process. Therefore, the empty friction between the piston and the column wall under the condition of no liquid is absolutely prohibited.

**E:** After the chromatography column is packing material, pay attention to daily maintenance during use: The solvent used should be ensured to be filtered. When the preparation is completed, the chromatography column shall be thoroughly rinsed. The reversed-phase chromatography column shall be filled with organic solvent (such as methanol or acetonitrile) when not in use. It should be avoided that pure water stops in the chromatography column for a long time

**F:** When weighing and mixing the packing material, personnel must wear masks to ensure their own safety.



## **5) Manufacturer guarantee**

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The Company, as a manufacturer of preparative column systems, undertakes to provide services by the company that include but are not limited to the following:

**5.1** XINSHENG Promise to provide after-sales service and support for all products.

**5.2** XINSHENG Promise to on the premise of observing the use rules, any quality problems of chromatography column (except sealing ring) within 12 months, all within the scope of warranty. The manufacturer is responsible for ensuring the normal operation of the equipment. but If the separation of the preparation column is caused by the filling process of the preparation column, the manufacturer will not make any commitment.

**5.3** XINSHENG Promise to when the equipment provided by us has problems, we guarantee to respond within 24 hours. Provide fault analysis and treatment report in time after fault treatment.

**5.4** XINSHENG after the warranty period of the products provided expires, we will continue to provide users with long-term technical support and services.

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