

**CONSTANT PRESSURE CONSTANT FLOW
Syringe Pump (Dual Pump)
Model RCHSB-250
Instruction Manual**



Part No.: 147-250

(Zhejiang, CHINA)

...Quality is Everything...

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1. Document Conventions

The following icons are used as necessary in this instruction manual.



NOTE. Notes emphasize additional information that may be useful to the reader.



CAUTION. Describes a situation or practice that requires operator awareness or action in order to avoid undesirable consequences



MANDATORY ACTION. Gives directions that, if not observed, could result in loss of data or in damage to equipment.



WARNING! Describes an unsafe condition or practice that if not corrected, could result in personal injury or threat to health.

ELECTRICITY WARNING! Alerts the operator that there is risk of electric shock



HOT SURFACE! Alerts the operator that there is a hot surface and that there is risk of getting burned if the surface is touched



EXPLOSION RISK! Alerts the operator that there is risk of explosion

Safety

Safe laboratory practices and procedures should be observed while operating and maintaining the constant pressure constant flow syringe pump

Battery Safety



The lithium battery can explode if they are stored in a hot location, charged improperly, or if the terminals contact metal, creating a short *circuit*

2. Introduction

RIGCHINA Group Company precision syringe pumps give you flow and pressure control throughout a broad operating range. RIGCHINA syringe pumps can be metered with great accuracy and do not exhibit pulsation or flow anomalies, typically associated with other pump types. The proven robust design lowers your down time and service costs to provide years of reliable and worry-free operation.

Versatile—RIGCHINA pumps can meet more demands than ever before.

RIGCHINA syringe pumps are now available in broader pressure ranges. Continuous Constant Flow or Pressure— Continuous Constant Flow or Pressure— RIGCHINA pumps operate in either constant fluid delivery or under constant pressure delivery.

Zero Pulsation—When pulsation cannot be tolerated in experiments, the RIGCHINA pump will deliver. Dual-pump operation offers continuous flow with no pulsation as low as 0.00001 mL/min and up to 20,000 psi of pressure.

The RCHSB-250 dual-cylinder constant flow and pressure pump uses a servo motor with a programmable controller and an intelligent touch screen for precise control of the pump's forward, backward, speed adjustment, and pressure regulation. The operation status and faults are indicated through animated demonstrations, and the real-time changes in liquid flow rate, cumulative flow, and pressure are displayed, featuring a simple operation and user-friendly interface.

The RCHSB-250 constant flow and pressure metering pump can operate independently with a single cylinder or continuously in constant flow mode with dual cylinders linked. It offers constant pressure and constant flow modes to meet the needs of different customers.

HANDLE A WIDE VARIETY OF FLUIDS INCLUDING:

- **Aqueous and organic liquids**
- **Corrosive solutions**
- **Heated fluids**
- **Liquefied gases**
- **Viscous fluids**
- **Slurries and pastes**

3. Features

- 1) **Large Screen LCD Display:** The backlit display clearly shows the pump's operating status, pressure, flow rate, and other parameters.
- 2) **Quick and Convenient Input:** All parameters can be easily entered via the touch keypad.
- 3) **High-Precision Control:** The pump uses an imported AC motor and servo system for control, offering high operating precision, large torque, compact size, and light weight. The servo system also includes protections against under-voltage, over-current, over-voltage, leakage, and overload.
- 4) **Smooth Transmission:** The pump utilizes an imported reducer, providing stable transmission, accurate transmission ratio, and low noise.
- 5) **High Displacement and Output Pressure:** The pump has a large displacement and high output pressure, reaching up to 50 mL/min at 70 MPa.
- 6) **Automatic Switching:** The dual pumps are controlled by solenoid valves to automatically switch pneumatic valves, with an automatic pressure-tracking function for smooth, pulse-free switching and high sensitivity, ensuring no leakage at high pressure.

- 7) **Dual Operating Modes:** The pump supports both constant pressure and constant flow modes, making it suitable for various displacement applications.
- 8) **Limit Protection:** The pump's limit protection pressure can be set to ensure safe operation.
- 9) **Limit Position Protection:** The pump automatically stops or retracts upon reaching the limit position.
- 10) **High-Precision Ball Screw:** Ensures high transmission precision and smooth operation.
- 11) **Precision Machining:** The pump body is finely machined, with a high-precision ground plunger, ensuring accurate displacement and no leakage at high pressure.
- 12) **RS485 Standard Interface:** The pump can be controlled via computer.
- 13) **User-Friendly Design:** The pump is mounted on a work platform, with a control keypad angled at 45° for easy operation and maintenance.

4. Specifications

The constant speed and pressure pump is composed of the pump body, transmission mechanism, reducer, AC servo motor, AC servo system, photoelectric encoder, pressure transmitter, controller, and an LCD touch screen. The dual-cylinder pump is equipped with an automatic switching system.

Table 2-1

NO.	Category	Specifications
1	Dual-cylinder pump volume	250ml*2
	Flow rate control range	0.001-50ml/min
2	Flow rate accuracy	0.3% of set value
3	Pressure control range	0-70MPa
4	Pressure accuracy	0.5%FS
5	Pipe diameter	1/8 "
6	Function	Constant flow mode
		Constant pressure mode
7	Power supply	AC 220V, 2KW

5. Operation Procedure

5.1 Preparation Before Use

- 1) Connect compressed air at 0.6-0.8 MPa to the air source interface.
- 2) Use a pipeline to connect the suction inlet to the injection medium.
- 3) Use a pipeline to connect the discharge outlet to the device to be displaced.
- 4) Connect the AC 220V power supply.

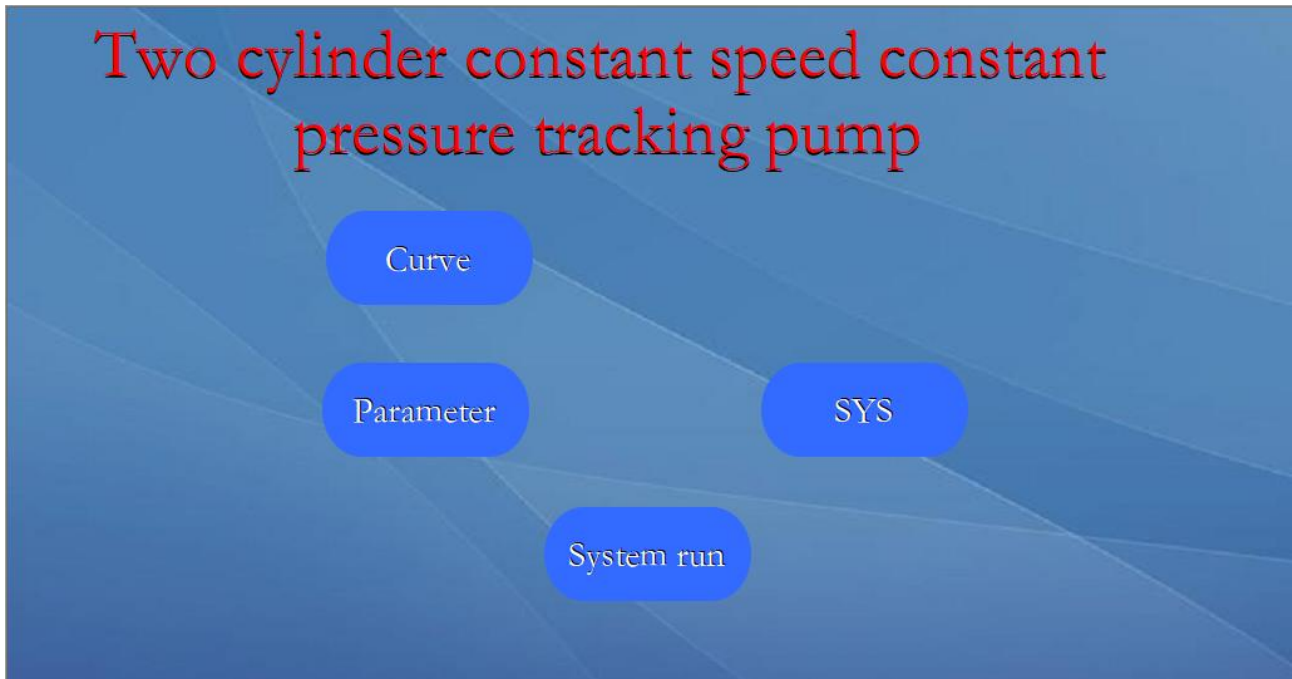


5.2 Constant Pressure Setting

- Press the **"Injection/Discharge"** button on the control panel to choose between liquid injection and discharge functions.
-
- The pump can quickly inject or discharge liquids at a flow rate of 50mL/min

5.3 Usage Steps

- Turn on the power switch to display the startup screen as shown.



5.4 System Settings

- 1) Press the system key to set the plunger diameter and pressure limit protection value. After setting, press the confirm key, then press the return key to save and return to the previous screen.
- 2) Press the stop key to stop the pump. Press the pause key to pause the pump. Press the continue key to resume operation.

Click **Parameter** to display the following screen:

- **Mode:** Choose the operating mode, with options for AB pump constant speed or AB pump constant pressure.

- **Suction:** Set the manual AB pump suction flow rate.
- **Drainage:** Set the manual AB pump drainage flow rate.
- **AT Absorb:** Set the automatic AB pump suction flow rate during continuous operation. The set value should be greater than the discharge flow rate during operation.
- **Alarm press:** Set the upper limit pressure alarm. When this pressure is reached, the pump will automatically stop.
- **ALM Restart:** Set the restart pressure. When the pressure falls below this level, the pump will restart automatically.

After setting the parameters, press **Return** to go back to the start screen.

The screenshot shows a control interface with a top status bar containing 'date ABCD', 'System run 12', and 'Week 12'. The main title is 'Parameter' and there is a 'Return' button. The central table displays the following data:

Mode	AB Press mode	
Suction	12.345ml/min	12.345ml/min
Drainage	12.345ml/min	12.345ml/min
AT Absorb	12.345ml/min	12.345ml/min
Alarm press	12.34MPa	
ALM Restart	12.3457MPa	

5.6 Flow Rate Setting

In constant flow mode, the pump will output the medium at the set flow rate.

Click **System run** to display the following screen:

■ **Constant Flow Mode:** The interface will display as follows:

- 1) Press **A Absorb**, **A Drain**, **B Absorb**, and **B Drain** to fill the pump chambers with the medium.
- 2) Set the desired flow rate in the **Flow set** box.
- 3) Press **Run** to start the pump.

System run Return

date: ABCD
System run: 12 Week: 12

AB constant mode

Entrance: 12.34Mpa

Entrance sensor, A sensor, B sensor

A SV alarm, A pump, B pump, B SV alarm

A pump res alarm, B pump res alarm

ALM rst

Run

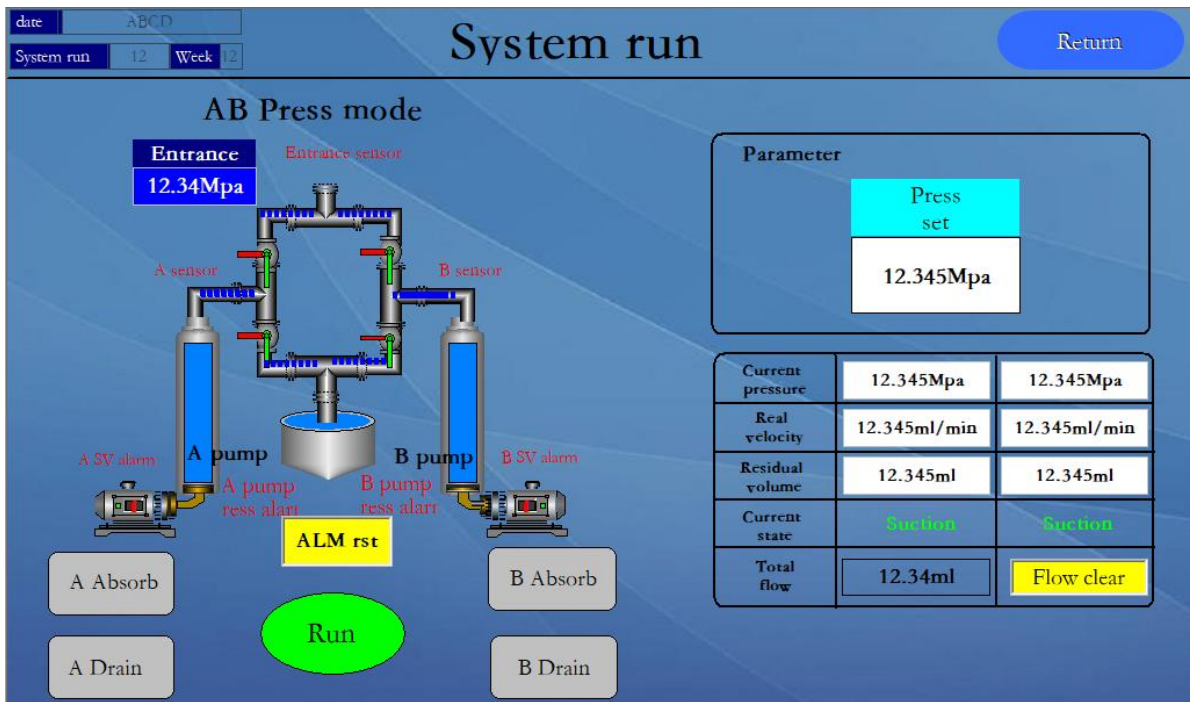
A Absorb, A Drain, B Absorb, B Drain

Parameter	
Flow set	12.346ml/min

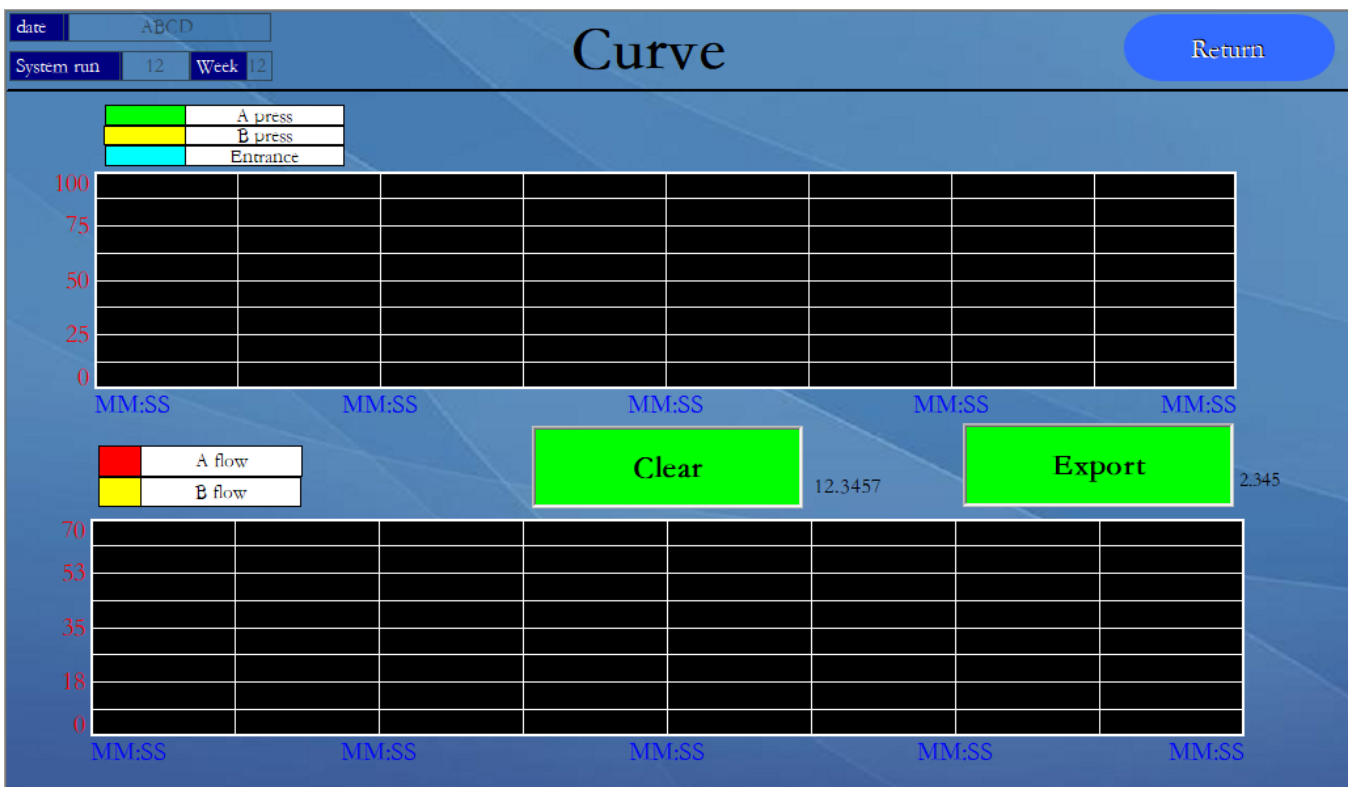
Current pressure	12.345Mpa	12.345Mpa
Real velocity	12.345ml/min	12.345ml/min
Residual volume	12.345ml	12.345ml
Current state	A STOP	B STOP
Total flow	12.34ml	Flow clear

■ **Constant Pressure Mode:** The interface will display as follows:

- 1) Press **A Absorb**, **A Drain**, **B Absorb**, and **B Drain** to fill the pump chambers with the medium.
- 2) Set the desired pressure in the **Press set** box.
- 3) Press **Run** to start the pump.



Click "**Curve**" to display the curve as shown below:



Click **"SYS"** to display the following screen:

These parameters are the basic parameters of the pump, pre-set at the factory.

date ABCD

System run 12 **Week** 12

SYS Return

A PAR

Pressure zero 12.3457MPa

unger diamet 12.3457mm

Full pressure 12.3457MPa

ratio 12.3457

Screw pitch 12.3457mm

Full volume 12.3457MI

Up small 12.3457

Down big 12.3457

B PAR

Pressure zero 12.3457MPa

unger diamet 12.3457mm

Full pressure 12.3457MPa

ratio 12.3457

Screw pitch 12.3457mm

Full volume 12.3457MI

Up small 12.3457

Down big 12.3457

valve test

A suction valve

A drain valve

B suction valve

B drain valve

Limit switch state

A lower limit

A upper bound

B lower limit

B upper bound

ENG

Kp 12.3457 Ki 12.3457 Kd 12.3457

Kp 12.3457 Ki 12.3457 Kd 12.3457

Range 12.3457MPa

High pressure test

Refill mode High pressure

6. Warranty and Returns

6.1 Warranty

Rigchina Group Company warrants its products to be free from defects in material and workmanship for a period of 12 months from the time of shipment. If repair or adjustment is necessary, and has not been the result of abuse or misuse within the twelve-month period, please return, freight prepaid, and correction of the defect will be made without charge.

Out of warranty products will be repaired for a nominal charge.

Please refer to the accompanying warranty statement enclosed with the product.

6.2 Returns

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Rigchina will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Rigchina Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

Our shipping address is:



RIGCHINA GROUP COMPANY

Location:: No.80-82, Qiude Road, West Cheng Industrial Estate,
Yongkang city, Zhejiang Province,
China, Postcode: 321300



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