Pump-M Series Infusion Pump

Operating Manual

Santaitech (Changzhou) Co., Ltd.

www.santaitech.com

Preface

Thank you very much for purchasing and using our Pump-M Series Infusion Pump. This manual provides detailed descriptions of the functions, operations and application methods of the Pump-M. Please read and fully understand this manual before operating the instrument to ensure correct use of the equipment

All rights of interpretation for this manual are reserved by Santaitech (Changzhou) Co., Ltd. All trademarks and product names mentioned in this manual are copyrighted to their respective legally registered companies.

Note: This manual, product, operating software and other related items are subject to modification due to system updates without prior notice.

Safety Precautions



Wear safety goggles to avoid injuries caused by chemical compounds or silicone materials.

If pipeline rupture or sudden valve opening occurs under excessive pressure, solvent ejection may happen. Never loosen pipeline fittings or open valves while the pump is running or pressurized. Stop the pump first and wait until the pressure drops to 0 bar, then wear protective gloves before any operation.



Electrical Hazard Warning: High voltage exists inside the instrument. Turn off the main power supply before opening any panel.

Opening the protective panel of the instrument requires authorized access or relevant professional training. If a non-standard power cord is used, confirm it complies with application requirements. Replacement fuses must have identical specifications to the original ones, and ensure the local mains voltage matches the equipment rated voltage.



Earthing Mark: The equipment must be properly earthed to prevent electric shock caused by electric leakage or lightning strike. The earthing resistance shall not exceed 0.1 Ω.



High Temperature Warning: Do not touch locally overheated components during operation to avoid scalding injuries.



Warning: Unknown risks may lead to severe hazards.

This instrument is manufactured in compliance with Chinese safety regulations; however, risks arising from human error or non-compliant operation cannot be ruled out. The infusion pump shall be placed in a laboratory environment and operated only by professionally trained personnel. In case of malfunctions or safety issues, contact your local distributor or the manufacturer promptly.

Table of Contents

一、 Overview ..... 오류! 책갈피가 정의되어 있지 않습니다.
1.1 Product Introduction 1
1.2 Product Features 2
1.3 Technical Specifications 3
1.4 Instrument Operation 3
14.1 Normal Operating Mode 3
1.4.2 Instrument Control Mode 6
二、 Installation ..... 오류! 책갈피가 정의되어 있지 않습니다.
2.1 Unpacking Inspection 7
2.2 Pipeline Installation 7
2.3 Installation Requirements 8
三、 Instrument Maintenance ..... 오류! 책갈피가 정의되어 있지 않습니다.
3.1 Fuse Replacement 9
3.2 Hardware Maintenance 9
3.3 Common Faults and Troubleshooting 10

Ⅰ. Overview

1.1 Product Introduction

The Pump-M Series is a high-precision, low-pulsation medium-low pressure infusion pump with flow ranges including 1–200 mL/min and a maximum working pressure of 200 psi. Featuring precise volumetric metering, it serves as the optimal choice for laboratory fluid transfer applications with flow rates below 200 mL/min (a 100 mL/min model is also available).

The flexible controller allows rapid adjustment of pump operating parameters such as flow rateand operation duration via the digital control panel, delivering excellent operational flexibility.

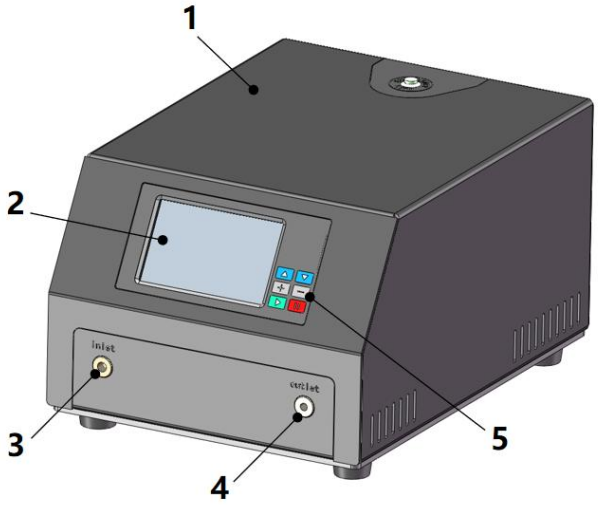


Figure 1

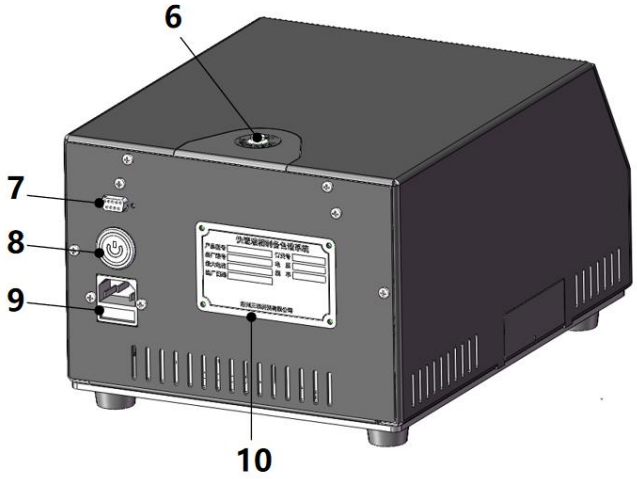


Figure 2

Note ：

1. Top cover of infusion pump
2. Touch screen – displays and sets parameters including flow rate and pressure
3. Pump inlet port
4. Pump outlet port
5. Physical key area
6. Emergency stop button
7. RS232/485 communication interface
8. Power button – for power on/off
9. Power supply socket
10. Nameplate

1.2 Product Features

1、Valve-free design with only one moving component, eliminating valve blockage and leakage issues commonly found in diaphragm and peristaltic pumps.

2、Ceramic pump head with high pressure resistance, avoiding frequent damage to peristaltic tubes and diaphragms.

3、Globally sourced key components; the high-precision valve-free ceramic metering pump delivers stable and reliable performance. Compact size saves laboratory space and facilitates transportation, equipped with highly integrated circuitry.

4、Extremely high material hardness ensures outstanding wear resistance and long service life. Its dense crystalline structure with zero porosity provides ultra-smooth surfaces, minimal friction and low fluid residue.

5、Low thermal expansion enables tighter plunger clearances for enhanced metering accuracy.

6、Supports data communication via RS232 and RS485 interfaces.

7、Wetted materials are resistant to organic solvent corrosion.

8、Built-in overpressure protection and flow calibration system.

9、Large LCD display screen.

10、Software Functions

(1) Real-time display of current pressure and set flow rate

(2) Timing function for preset pump runtime.

1.3 Technical Specifications

Item	Pump-M 100I	Pump-M 200I
Fluid Delivery Mechanism	Valve-free metering pump, high precision, long service life, maintenance-free	Valve-free metering pump, high precision, long service life, maintenance-free
Flow Rate	1–100 mL/min	1–200 mL/min
Flow Accuracy	±1%	±1%
Maximum Pressure	100 psi (6.9 bar)	200 psi (13.8 bar)
Power Supply	100–240 V, 50/60 Hz	100–240 V, 50/60 Hz
Power Consumption	45 W	50 W
Dimensions (L×W×H)	330×240×185 mm	330×240×185 mm
Net Weight	6 kg	6 kg
Part No.	IPMP1090	IPMP1089

1.4 Instrument Operation

14.1 Normal Operating Mode

The device defaults to Normal Operating Mode after power-on, with the main user interface displayed directly (Figure 3)

1.4.1.1 User Interface



(Figure 3 User Interface)

The user interface contains four data labels: Flow Rate, Pressure, Timer and Progress. Pressure and Progress cannot be edited, while Flow Rate and Timer values are adjustable. Tap the Flow Rate value area to pop up a numeric keypad (Figure 4 Numeric Keypad). Tap digital buttons on the keypad to input target values and tap Confirm to save the new flow rate. Similarly, tap the Timer value area to pop up the numeric keypad and adjust timing values.



(Figure 4 Numeric Keypad)

After setting flow rate, tap Start to run the pump (Figure 5 Pump Running Interface). If no timer value is set before startup, the pump runs continuously at the set flow rate; otherwise, it stops automatically after the preset duration.



(Figure 5 Pump Running Interface)

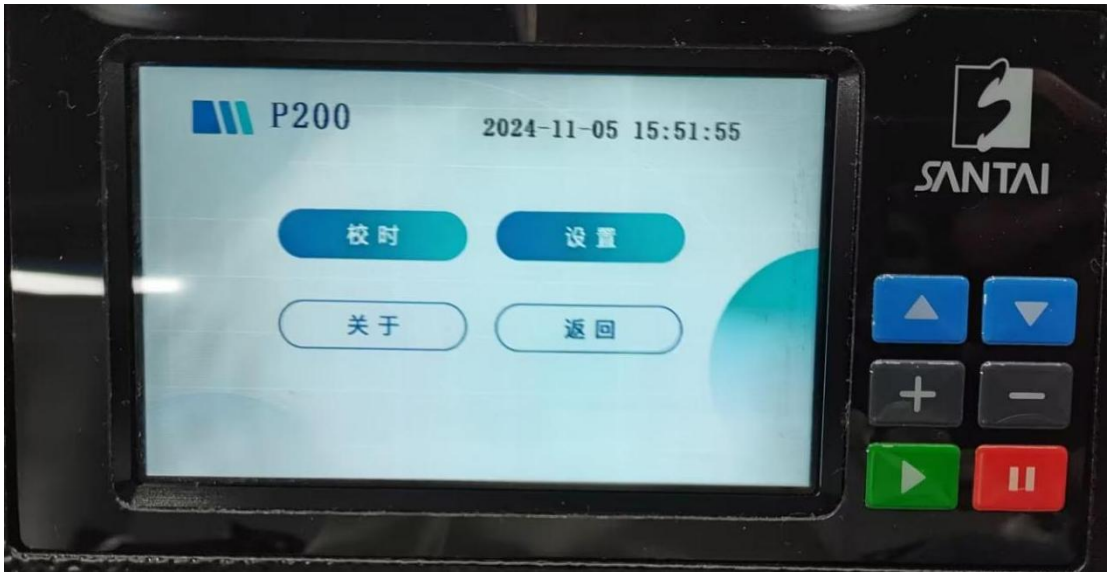
Physical buttons on the equipment can also adjust Flow Rate and Timer values:

UP/DOWN: Switch editable items between Flow Rate and Timer

+/-: Increase or decrease parameter values、RUN/STOP: Start or stop pump operation.

1.4.1.2 Advanced Interface

When the pump is stopped, tap More to enter the advanced function interface (Figure 6 Advanced Function Interface), including Time Calibration, Settings and About.



(Figure 6 Advanced Function Interface)

Tap Time Calibration to enter time setting page, with Year, Month, Day, Hour, Minute, Second displayed. Tap each value field to edit. The year range is limited to 2000–2099. Tap Time Calibration again to complete time synchronization.

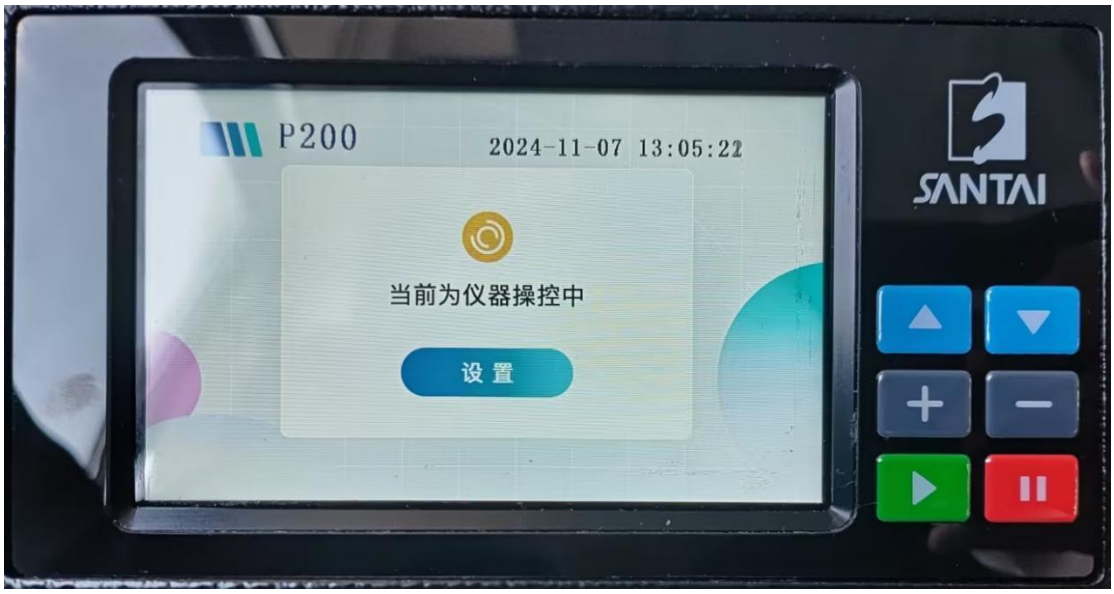
Tap About to view factory production date, serial number and equipment model.

Tap Settings to adjust Max Flow Limit, Max Pressure Limit and Instrument Cont rol. Tap value fields to edit; the upper limit value depends on the pump model, rangin g from 0–100/200. Long press Confirm to save and return to advanced menu.

Note: If Instrument Control is enabled, power off and restart the machine to activate I nstrument Control Mode.

1.4.2 Instrument Control Mode

This mode applies when the infusion pump is connected to Sepabean machine L. After enabling Instrument Control, the equipment boots directly into this mode with t he control interface displayed (Figure 7 Instrument Control Interface). All parameter a djustments must be sent from the host instrument; only the Settings page is locally acc essible via touchscreen.



(Figure 7 Instrument Control Interface)

Ⅱ. Installation

2.1 Unpacking Inspection

1. Check all packaging of the Pump-M infusion pump.
2. Inspect the pump and accessories for damage after unpacking. Contact our Sales Department or authorized agents if damage is found.
3. Retain all shipping and packaging materials for future transport.
4. Check all items against the packing list. Contact sales immediately if any items a re missing.

2.2 Pipeline Installation

Install the supplied flexible tubing to corresponding connector ports as marked on the instrument panel.



Instrument inlet port: 3/16 inch tubing

Instrument outlet port: 1/8 inch tubing

Refer to the attached schematic diagram for 12g separation column connection.



2.3 Installation Requirements

Normal operating conditions:

Ambient temperature: 5～35 ℃

Relative humidity: 20%～80%

Power supply: 100～240 V, 50/60 Hz

The room shall be free of flammable, explosive, strong corrosive gas, severe vibration, electromagnetic interference and strong air convection. Ensure reliable earthing.

Ⅲ. Instrument Maintenance

3.1 Fuse Replacement

Fuse replacement steps:

1、Turn off the power switch.

2、Unplug the power cable from mains socket.

3、Use a flathead screwdriver to open the fuse cover.

4、Install new fuse and close the fuse box cover

3.2 Hardware Maintenance

3.2.1 Solvent Filter Cleaning

Remove clogged solvent filter from bottle head assembly. Place filter in a beaker of isopropanol for ultrasonic cleaning, then rinse thoroughly with pure water.

3.2.2 Pump

This is a maintenance-free valve-free metering pump. Users are not allowed to disassemble pump assemblies; only solvent connectors connected to the pump can be operated.

3.2.3 Preventive Maintenance Schedule

Maintenance Item	Cycle
Inspect pipelines and fittings for kinks, leakage or air bubbles	Weekly; or whenever flow deviation, leakage or air bubbles occur
Replace tubing and fittings	Annually
Check cleanliness of solvent reservoir bottles	Daily

3.3 Common Faults and Troubleshooting

Symptom	Cause	Solution
Pump runs but no fluid output	Empty solvent reservoir	Refill the solvent bottle
Actual flow lower than set value	Contaminated filter head	Clean or replace filter head
	Kinked tubing	Replace tubing
No solvent delivery	The pump is not running and the power switch is not on	Turn on power
	Bottle lower than pump head	Raise bottle to same/higher level
Abnormally high pressure	Blocked pipeline	Clear blockage
	Tubing inner diameter too small	Fit tubing with proper inner diameter
Pump stops during operation	Pressure exceeds upper limit	Reset max pressure limit
		Replace the chromatographic column
		Replace the pipe with an appropriate inner diameter
Reduced pump flow	Air bubbles trapped in pump	Run pump at high flow to purge air
	Clogged solvent filter	Open the inlet pressure cap of the pump head. If the solvent cannot flow out of the delivery pipe quickly, it indicates that the filter is clogged and needs to be cleaned or replaced
	Plunger seal leakage	Replace the plunger seal
Unstable flow	Trapped air bubbles	Purge air at high flow
	Immiscible solvents	Add transitional solvent for miscibility
	Leaking / partially blocked tubing	Inspect tubing segment by segment
Humming noise, pump fails to start	Motor malfunction	Stop pump for inspection
	Driver abnormality	Stop pump for inspection
	Overpressure	Refer to "Abnormally high pressure"

To ensure your safety, colleagues' safety and equipment operation safety, please comply with the following rules:

- Ensure sufficient indoor ventilation;
- Use national standard certified power cords;
- Wear safety goggles and protective gloves;
- Clean up spilled liquid and secure solvent bottles;
- No smoking or open flame when handling flammable solvents.

Santaitech (Changzhou) Co., Ltd.

No.78 Qingyang Road, Xinbei District, Changzhou City, Jiangsu Province, China

Tel: 0519-8515 0175

Service Hotline: 400-625-6090

Email: techsupport@santaitech.com

Websites: www.santaitech.com

www.chembeaggo.com