

**BeneFusion SP3**

**BeneFusion SP3 Ex**

**Syringe Pump**

**Operator's Manual**



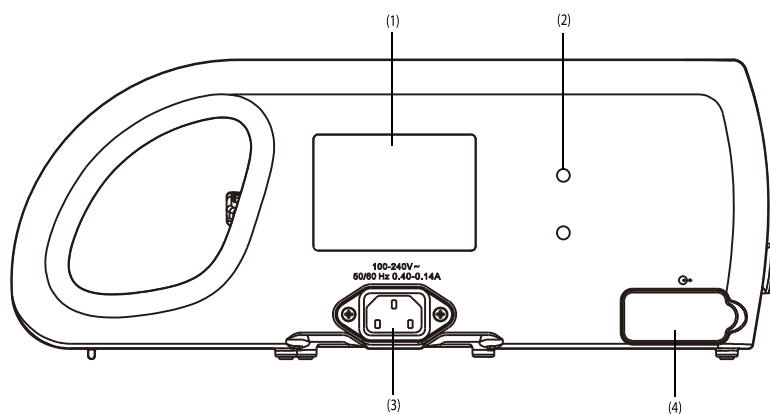
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- (8) **<BOLUS >**
- During infusion, press this key to enter the **[Bolus]** settings screen.
  - Under non-running status, press this key to enter the **[Purge Air]** prompt screen.
- (9) **<AUDIO PAUSED>**  
Pauses alarm sound (except No Battery) or low level alarms are acknowledged.
- (10) **<POWER>**  
Used for turning power on, entering in standby state and turning off operations.
- (11) **<MENU>**
- Used for entering **[Main Menu]** interface.
  - Under operation status, press and hold this key to lock; in locked state, press and hold this key to unlock.
- (12) AC/DC indicator
- On: The pump is connected to an AC/DC power supply (including shutdown).
  - Off: The pump is not connected to an AC/DC power supply.
- (13) Battery indicator
- Steady green: The battery is charging (including shutdown).
  - Flashing: The pump is running on battery power.
  - Off: There is no battery or the battery is not working.
- (14) Extension tubing clamp  
Fixes the extension tubing.
- (15) Syringe fixation clamp
- (16) Slider  
Secures syringe and drives plunger assembly.
- (17) Handle

## 2.2.2 Rear View



- (1) Product label
- (2) Pole clamp mounting holes (two)
- (3) AC power input  
Connection for the AC power cord.
- (4) Multifunction connector with the following functions:
  - DC-in connector
  - RS232 connector
  - Nurse call connector

# 7 Other Functions



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## 7.1 History Record

The equipment when in use will produce some key data stored in **[History Record]**, providing foundation for the treatment review and maintenance review at a later period. The attribute of recording events includes action, time and description.

If the equipment is disconnected from the AC or DC power supply, history records are saved and the time of equipment power-down is also recorded as an event. If the equipment runs on battery power, battery failure has no impact on the history records stored, and the time of battery failure is not recorded.

1. Select **[Main Menu]**→**[History Record]**.
2. Select **[History Record]**: Each page can demonstrate up to 2 records, and press

  to turn the pages.

### NOTE

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- **The equipment stores up to 2000 events. When the capacity is reached, earlier events will be overwritten by later ones.**
  - **A total loss of power has no impact on the history records stored.**
  - **Alarms are saved as events and will remain if the equipment is powered down. The time of equipment power down is also recorded as an event.**
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## 7.2 Power-down Storage

To prevent the loss of patient data and alarm settings when the equipment suddenly powers down, the equipment provides power-down storage. Alarms limit setting are saved and will be maintained if the equipment is powered down suddenly. The storage time is equals to the equipment's service life. The alarm limit settings before power-down are reloaded when the equipment is restarted. You can refer to **[History Record]** to view such information as infusion parameters and alarm.

## 7.3 Nurse Call

Select **[Main Menu]**→**[System Options]**→**[Nurse call]**, and set in the open menu:

- Switch

On: Indicates switching on the nurse call function.

## 11.2 Maintenance Plan

The following tasks must be conducted by professional maintenance personnel approved by the company. Please contact the company if the following maintenances are needed. Must clean and disinfect the device before the test or maintenance.

Inspection/Maintenance Items	Frequency
Perform a safety inspection according to the IEC60601-1 standard.	Once every two years. Perform after the board is changed or the pump is accidentally dropped.
Preventive maintenance (refers to the Maintenance Manual for pressure calibration, sensor calibration, and pump inspection).	Once every two years, or when you suspect the occlusion alarm is abnormal, the flow volume is inaccurate, or the syringe is incorrectly identified.

## 11.3 View Information

Select **[Main Menu]**→**[History Record]**. In the **[History Record]** interface, you can view the infusion parameters, alarm information, operation information and other information.

Select **[Main Menu]**→**[System Options]**→**[Version Information]**. In the **[Version Information]** interface, you can view the Software Version, Brand Library Version and other versions.


## 11.4 Accuracy Calibration

The syringe in the pump needs no daily calibration. But calibration is required when the pump is used for the first time, is replaced with a new syringe brand or when you suspect the deviation of the flow volume is much larger.

Prepare the following materials before the calibration:

- Syringe: Standard 5ml, 10ml, 20ml, 30ml, and 50ml/60ml syringes, without liquid.

The steps for calibration are as follows:




1. Load the syringe correctly and pull the syringe to the full scale position. "L" in the fig. below refers to the full scale position of the 50ml syringe.
2. Select **[Main Menu]**→**[User Maintenance]**→Input User Maintenance Password→**[System Calibration]**→**[Accuracy Calib.]**.
3. Select Brand and Size of the current syringe in the **[Syringe Selection]** interface.
4. Press  and the pump starts automatic calibration.
5. The screen prompts **[Calibration successful]** after the calibration is successful.





## C Alarm Information

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This chapter presents the alarm information of the pump. Prompt information for operation guidance will not be presented in this chapter.

The table shows the appropriate solutions for each information related to alarm triggering. If the problem still exists after operating according to the solutions, please contact the company.

Alarm	Priority	Causes	Solutions
[Occlusion]	High	During infusion, an occlusion in the infusion tube between patient and equipment occurs and reaches the preset threshold.	<ul style="list-style-type: none"> <li>Check the line and eliminate source of the alarm.</li> <li>Check if the occlusion pressure setting is reasonable.</li> </ul>
[No Battery]	High	Battery is empty when powered with built-in battery.	Connect to the AC/DC power.
[VTBI Complete]	High	Infusion volume delivered reaches the preset VTBI.	<ul style="list-style-type: none"> <li>Alarm is cleared after  is pressed.</li> <li>If KVO Rate is preset, press  to confirm KVO infusion.</li> </ul>
[KVO Finish]	High	KVO infusion has run for 30 minutes.	Alarm is cleared after  is pressed.
[Syringe Disengaged]	High	Syringe is disengaged during infusion.	Correctly load the syringe.

[System Error]	High	Power supply voltage abnormal (overhigh), AD value of sensor abnormal, communication abnormal and other errors.	Alarm cannot be cleared. Please stop operation and contact the service personnel.
[Syringe Empty]	High	Syringe is empty during infusion.	Alarm is cleared after  is pressed.
[No Syringe]	High	Start infusion without loading syringe or loading syringe incorrectly.	Check and correctly load the syringe.
[System Abnormal]	Medium	Power supply voltage abnormal (low) and other abnormal.	Alarm cannot be cleared. Please stop operation and contact the service personnel.
[Standby Time Expired]	Medium	Pump is in standby mode and standby time is completed.	Alarm is cleared after  or  is pressed.
[Reminder]	Low	Perform no operation during the setting value of [Reminder Time].	Operate the pump.
[Low Battery]	Low	Only powered with built-in battery, battery charge is insufficient.	Connect to the AC/DC power.
[Time Near End]	Low	Infusion remaining time reaches the setting value of [Time Near End].	<ul style="list-style-type: none"> <li>Alarm will not be cleared automatically until the infusion is completed, and then switch to [VTBI Complete] or [Syringe Empty] alarm.</li> <li>Press  to stop infusion and alarm is cleared.</li> </ul>



[Syringe Near Empty]	Low	Required time for the remaining liquid within the syringe reaches the setting value of [Time Near End].	<ul style="list-style-type: none"> <li>Alarm will not be cleared automatically until the infusion is completed, and then switch to [VTBI Complete] or [Syringe Empty] alarm.</li> <li>Press  to stop infusion and alarm is cleared.</li> </ul>
[No AC Power]	Low	Power cord disconnected.	Connect to the AC/DC power.
[Communication interrupted]	Low	Network communication between pump and CIMS is interrupted for 3 minutes after successful communication.	<ul style="list-style-type: none"> <li>Recover the network communication with CIMS.</li> <li>If the alarm persists, contact the service personnel.</li> </ul>
[KVO Running]	Low	Start KVO infusion.	<ul style="list-style-type: none"> <li>Alarm is cleared automatically when KVO mode runs 30 minutes.</li> <li>Press  to stop infusion and the alarm is cleared.</li> </ul>
[Infusion interrupted]	Low	After any of the [Occlusion], [Syringe Disengaged] or [No Battery] alarm is cleared.	Press  to resume infusion.
[Please reset time]	Low	RTC time is reset when the pump is on.	Reset the time.
[Para. Unconfirmed]	Low	No operation is performed within 10s under the parameters setting status.	Edit and confirm parameters.