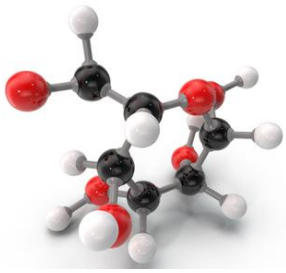
M-100 Biosensor Analyzer

Operating Manual

Version--8.9



Company Profile

Shenzhen Sieman Technology Co., Ltd. is a provider based on the vast global market, which is dedicated to providing the global advanced devices, technologies and concepts for the users in the pharmaceutical, fermentation industry, life sciences, biological engineering, food, fine chemical, teaching and research industries, as well contributing our strength to the scientific and technological progress of the world. A professional team composed of our technical application specialists, sales specialists and after-sales engineers will provide our customers with high-quality and professional pre-sales technical consultation, solution design and after-sales service.

Chapter I: Introduction on Device

1. Concept

This device is available for detecting the concentration of the test sample by use of the specially designed bio-oxidase membrane electrochemical sensor. The device can automatically collect samples and import them into the test area. The test substance contained in the sample will undergo an enzymatic hydrolysis reaction under the catalysis of an immobilized bio-oxidase to generate hydrogen peroxide. The concentration of the test substance is calculated by the hydrogen peroxide concentration that is generated in the detection of hydrogen peroxide electrode. The device can calibrate a standard item with a known concentration, and the voltage value of the standard item is a measure of the concentration of the test substance. The unknown concentration can be obtained through the comparison with the voltage signal of the standard item. The sensor electrodes will be automatically cleaned by the system buffer solution after each measurement is completed, and the next test can be performed after cleaning.

2. Purpose

The M-100 series biosensor analyzer successfully developed by our company is an intelligent analysis equipment available for the fast and accurate determination of Glucose, Lactate, Glutamate, Lysine, Ethanol, Methanol, Glutamine, Glycerol, Xylose, Sucrose, etc., which has a wide range of applications in a number of industries and departments such as food fermentation, biochemicals, pharmaceuticals, brewing, feed fermentation, universities, research institutes, disease control centers, and sports.

3. Features

● Fully automatic mixing and cleaning system

● High-precision Teflon coating sampling needle

● Ultra high reliability imported pump and valve control system

● Automatic sampling to avoid human error

● Fully automatic calibration to ensure the accuracy of test results

● Minimum sample size is only 10uL.

● Reliable performance and quality due to independent core technologies based on more than 20 years of manufacturing experience

●Excellent electromagnetic compatibility performance to ensure the reliability of the instrument system.

● Embedded sample tray with up to 15 sample positions

● Visual and intuitive operation interface, 8-inch color touch screen human-computer interaction

● Test results being reviewed, printed and transmitted in real time

● External reagent in low cost and easy operation

4. Technical Indicators

Test principle	Enzyme electrode method
Electrode	Rod electrode
Measuring range	Glucose(G1001): 0.05 ~ 1g / L Glucose(C1001): 0.3 ~ 9g / L Lactate: 0.03 ~ 2g / L Glutamate: 0.03 ~ 1g / L Lysine: 0.03 ~1g / L Methanol: 0.03 ~ 0.5g / L Ethanol: 0.03 ~ 1g / L Xylose：0.03 ~ 1g / L Glycerol：0.03 ~ 1g / L Sucrose：0.03 ~ 2g / L Glutamine：0.03 ~ 1g / L
Resolution	0.01g/L
Precision (CV%)	<2%
Enzyme membrane life	Glucose: ≤30 days Lactate: ≤30 days Glutamate: ≤30 days Lysine: ≤30 days Sucrose: ≤15 days Ethanol / methanol: 5~10 days Xylose: ≤15 days Glycerol: ≤15 days Glutamine：≤15 days
Ambient temperature	10~35°C
Relative humidity	≤85% (no condensation water)
External dimension	480×320×210mm
Power supply	110V or 220V, 50Hz, 60Hz, separate three-hole socket with good grounding
Power	100VA
Weight	9kg
Screen	8-inch color touch screen

Chapter Ⅱ: Composition and Installation of Device

1. Composition of Device

Front view

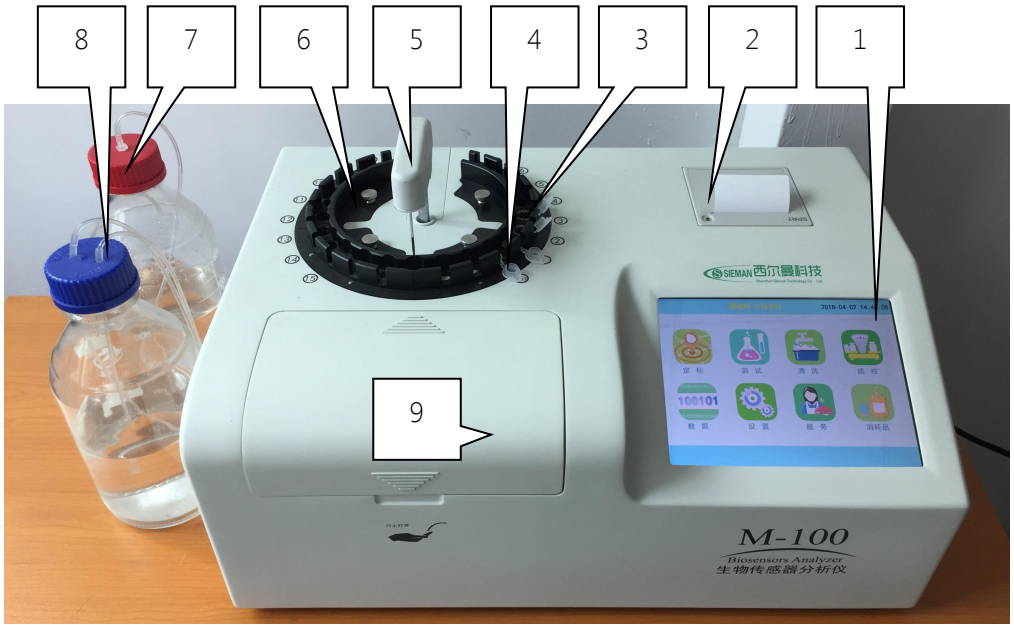


Fig.1

1. Touch screen
2. Printer
3. Sample position (No.1 to 15 cup position)
4. Standard solution cup position
5. Full-automatic sampling rack
6. Sample tray
7. Waste bottle (red bottle cap)
8. Buffer bottle (blue bottle cap)
9. Test chamber door cap

Rear view

Fig.2

1. Power interface / switch (built-in fuse)
2. USB interface
3. Ethernet port
4. RS232 serial port
5. Fan

Side view

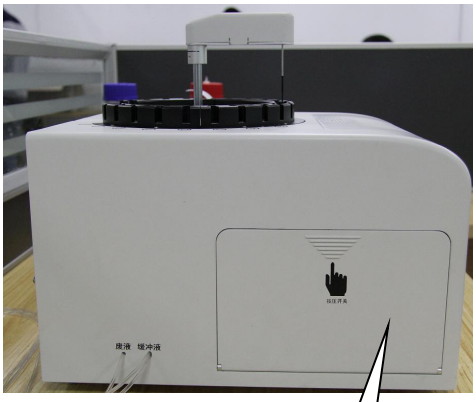


Fig.3

Fig.4

1. Double peristaltic pump
2. Single peristaltic pump
3. Buffer inlet
4. Waste liquid outlet
5. Peristaltic pump chamber cover

2. Installation of Device

Installation of pump tube

The pump tube is connected when the instrument leaves the factory, but the pump tube clip is not installed in place. This is to prevent the pump tubing from sticking when there is no liquid activity. Figure 4 shows the snap-in position of the peristaltic pump and pump tube in the factory state. Figure 5 shows the peristaltic pump in place.(**When the instrument is used for the first time, the pump pipe buckle must be installed in place as shown in Figure 5, otherwise the instrument can not work normally.**)

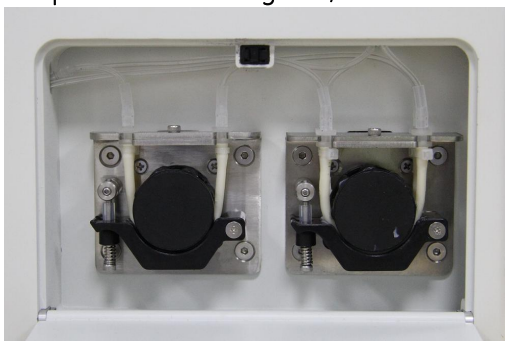


Fig.5

1 .Pump tube　　2 .Pump tube pressure plate　　3. Pump tube clamp

3. Installation and maintenance of electrode

3.1 Electrode installation

The ex-factory device has been installed with electrode rod as shown in Fig.6, but the electrode enzyme membrane is not installed.

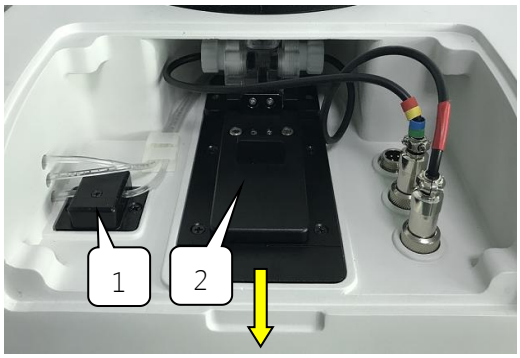


Fig.6

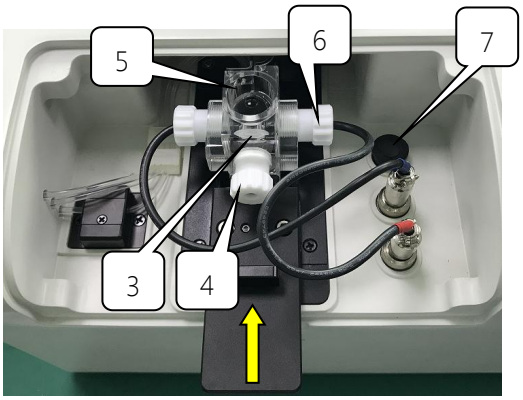


Fig.7

1. Photosensitive detector　　2. Slider　　3. Stirrer

4. Dummy electrode　　5. Reaction cell (two channels / three channels)

6. Electrode　　7. Reserved positions for electrodes

Before use, the electrode enzyme membrane is installed according to the following steps.

1. Pull the slider in the direction shown by the arrow in Fig.6 to the state as shown in Fig.7;
2. Unscrew the electrode rod as shown in Fig.8, wipe the surface of electrode silver sheet with a sponge, and use the sponge gray side clean it first, then use the sponge white side clean it, as shown in Fig.9;
3. Use a dropper to add a small amount of buffer to the silver sheet as shown in Fig.10;
4. Clamp the edge of the enzyme membrane aprons with tweezers to install the electrode enzyme membrane into the groove on the end face of the electrode rod as shown in Fig.11;

(Note: tweezers must not touch the middle of the enzyme membrane to avoid damaging the enzyme membrane)

5. After the enzyme membrane is installed, wipe the buffer overflow around the electrode rod as shown in Fig.12, and install the electrode back to the reaction cell as shown in Fig.13;


Fig.8

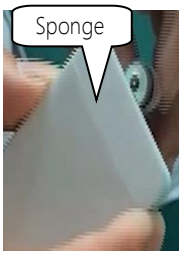


Fig.9

Fig.10

Fig.11

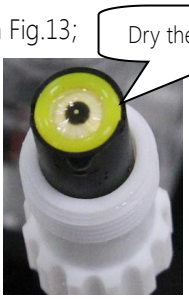


Fig.12

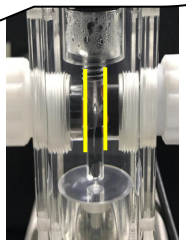


Fig.13

6. Push the slider inward in the direction of the arrow as shown in Fig.7 until it is in place;

This device contains at least one test channel and up to three channels.

3.2 Replacement of electrode enzyme membrane

The electrode enzyme membrane has a useful life, so that a new electrode enzyme membrane needs to be replaced as per the prompts of the device.

Please note the storage conditions and expiry date on the enzyme membrane packaging.

When the instrument prompts to replace the enzyme membrane (first check whether the instrument has misreported the membrane due to the lack of standard solution) on the main interface of the instrument, click "Service", "Replace membrane", and then "OK". When the instrument is ready, press the following figure The steps are shown below.

1. Unscrew the electrode rod from the reaction cell and remove the electrode enzyme membrane;
2. Install the new electrode enzyme membrane to the instrument according to the steps of "3.1 Electrode Installation";
3. Click Finish on the instrument interface, the instrument automatically enters the calibration, and the membrane is changed.

Note: **Due to the biological activity of the enzyme membrane, the activity of the newly installed enzyme membrane will change slightly in a short period of time. This process is about 4 hours. The machine can also be tested normally during this period. However, if a high precision test is needed, it should be carried out after 4 hours.**

4.Place standard solution and sample

Place the standard solution Take out the M-100 analyzer standard solution, use a pipette to suck the standard solution (not less than 500ul) and add it to the sample cup (Fig. 14), and put the standard solution into the calibration position (Fig. 15).

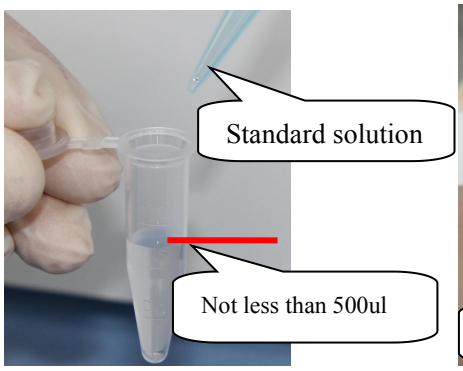


Fig.14

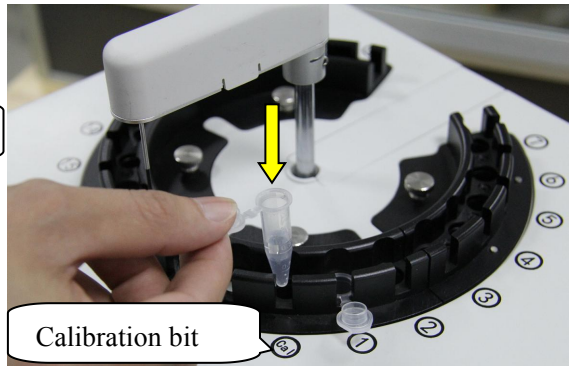


Fig.15

Place the sample Centrifuge the sample and take the supernatant into the EP tube as shown in Fig.16 and Fig.17. **(If the sample pH is in the range of 5-8, the supernatant can be directly centrifuged for testing; if it is not in this pH range, it must be adjusted to this pH range before testing)**

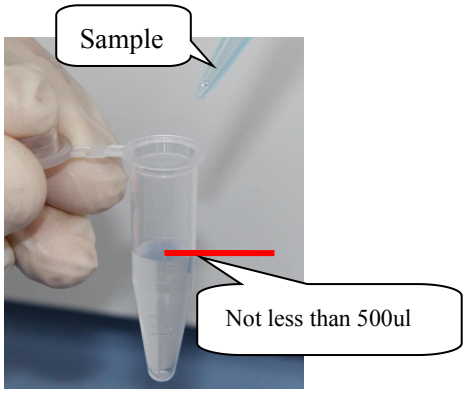


Fig.16

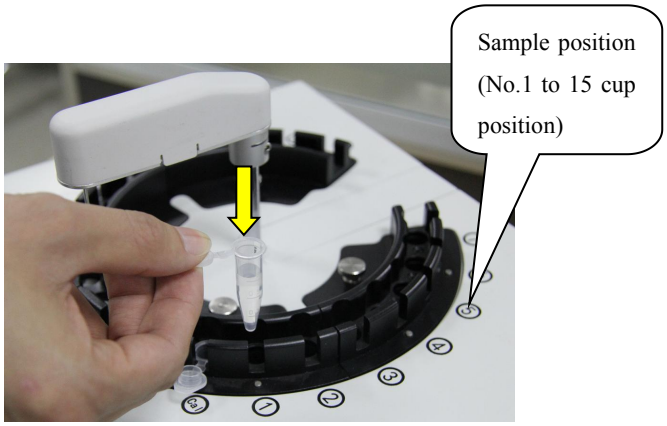


Fig.17

After placing the EP tube of standard solution and samples to the appropriate test position, click the **"Test"** icon in the main menu interface first, and then click the **cup number** where the sample is located. The instrument will automatically perform calibration and complete the test.

Note: If the standard solution in the calibration position is left in the air for more than 4 hours, please replace it. Do not recycle standard solution.

5. Preparation of buffer solution

Pour the buffer powders into a 1L reagent bottle as shown in Fig.18-19, and ensure that all buffer powders enter the 1L reagent bottle.

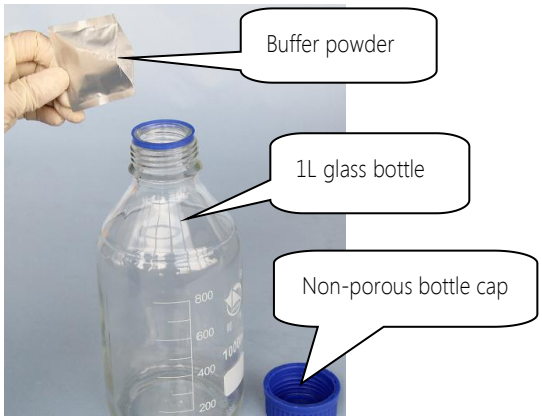


Fig.18

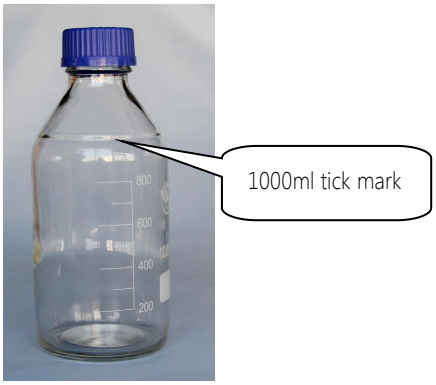


Fig.19

Add the deionized pure water to the 1000ml tick mark of the reagent bottle.

Shake the reagent bottle upside down to fully dissolve the buffer solution in the reagent bottle and leave it for 2 hours before use.

6. Verification of test accuracy

An example of glucose verification: Use the deionized pure water to respectively prepare 0.5g/L, 1g/L, 1.5g/L, and 2g/L glucose aqueous solutions. Make sure that the concentration of the prepared sample is within the test range of the device. Dilute it before testing if it exceeds the measurement range.

Note: The commercially available glucose powder for analysis is D-glucose, of which D-glucose is divided into α-D-glucose and β-D-glucose (the specific ratio varies depending on the manufacturer). After D-glucose is completely dissolved in aqueous solution, α-D-glucose will gradually transform to β-D-glucose, which will last about 4 hours. The glucose oxidase-based biosensor only recognizes β-D-glucose, so that it is necessary to wait for about 4 hours before testing a series of prepared glucose standard solutions on the device, otherwise the measured value will be low.

7. Opening and Closing of Device

This device is designed for continuous use. The electrode enzyme membrane system and fluid flow must be energized to maintain reliability.

It is recommended to disconnect the power of device only if it is not used for a long time (more than 4 weeks), and take appropriate measures before disconnecting the power.

It is necessary to clean the pipeline with pure water before shutting down when the device is not in use for a long time!

Replace the buffer solution with pure water, and operate the device according to the procedures of **"Service" → "Device Suspension"** in the main menu, in order to prevent the pipeline from crystallizing and affecting the next reactivation.

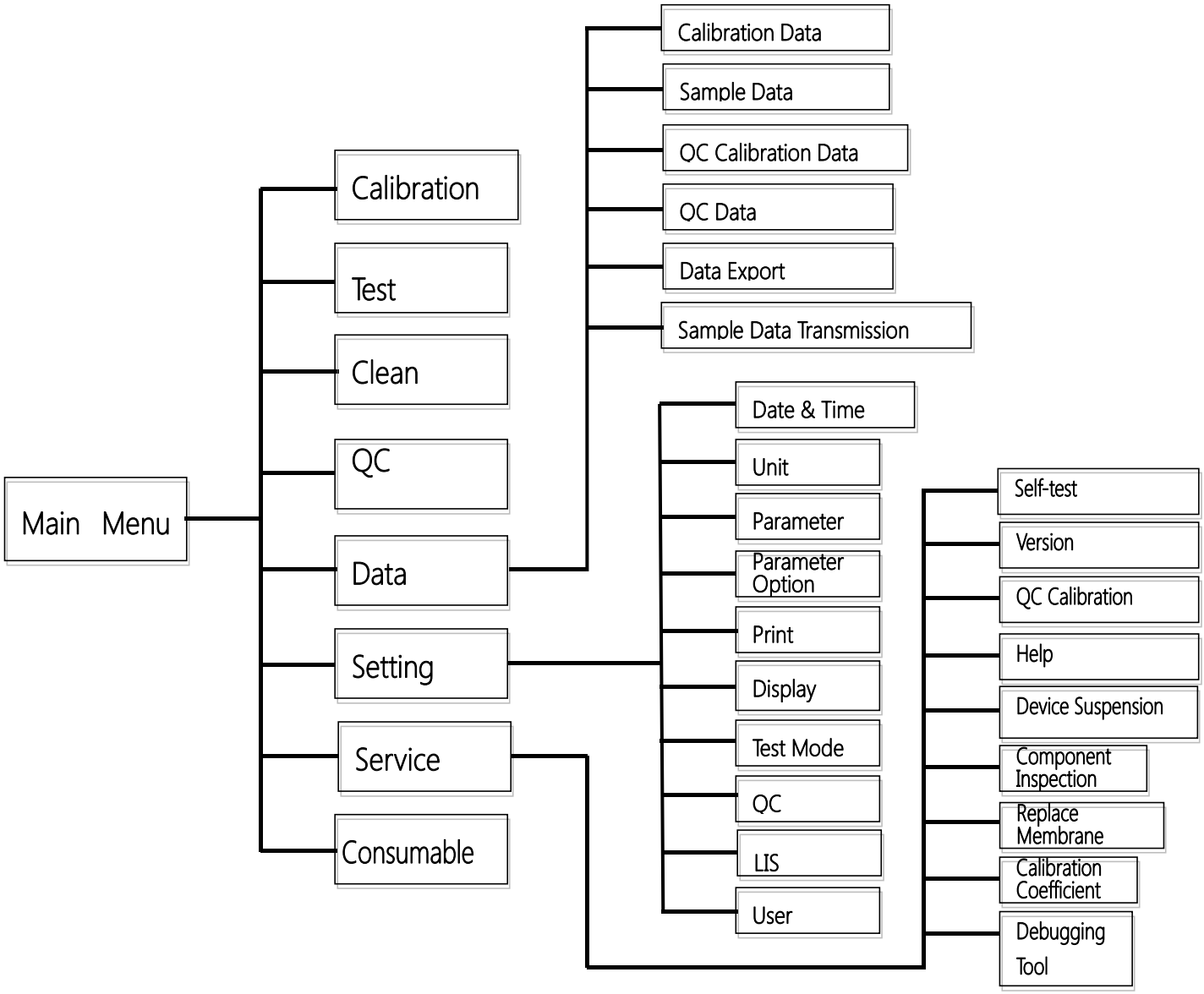
The enzyme membrane must be replaced if it is ready for next use after the device is deactivated!

8. Storage and validity of reagent consumables

Name	Storage	Validity
Buffer powder	Normal temperature	12 months, please use up within 30 days after unpacking
Standard solution	0~8°C	12 months, and 30 days after unpacking
Glucose enzyme membrane	0~8°C	12 months, operation life for ≤30 days (slightly different according to the specific sample type)
Lactase membrane	0~8°C	12 months, operation life for≤30 days (slightly different according to the specific sample type)
Glutamase membrane	0~8°C	12 months, operation life for ≤30 days
Lysinase membrane	0~8°C	12 months, operation life for ≤30 days
Ethanol / methanolase membrane	-10 ~ -20℃	12 months, operation life for 5 ~ 10 days (slightly different according to the specific sample type)
Xylase membrane	-10 ~ -20℃	12 months, operation life for ≤15 days (slightly different according to the specific sample type)
Glutaminase membrane	-10 ~ -20℃	12 months, operation life for ≤15 days
Glycerase membrane	0~8°C	12 months, operation life for ≤15 days
Sucrase membrane	0~8°C	12 months, operation life for ≤30 days (slightly different according to the specific sample type)

Chapter III: Software Operation

1. Interface menu structure



2. Main interface

Calibration: Calibrate the instrument with a standard solution, and place the standard solution in the "CAL" cup position on the sample tray;

Test: Sample test, the sample is placed in the "1-15" cup position on the sample tray;

Clean: Clean the device flow path;

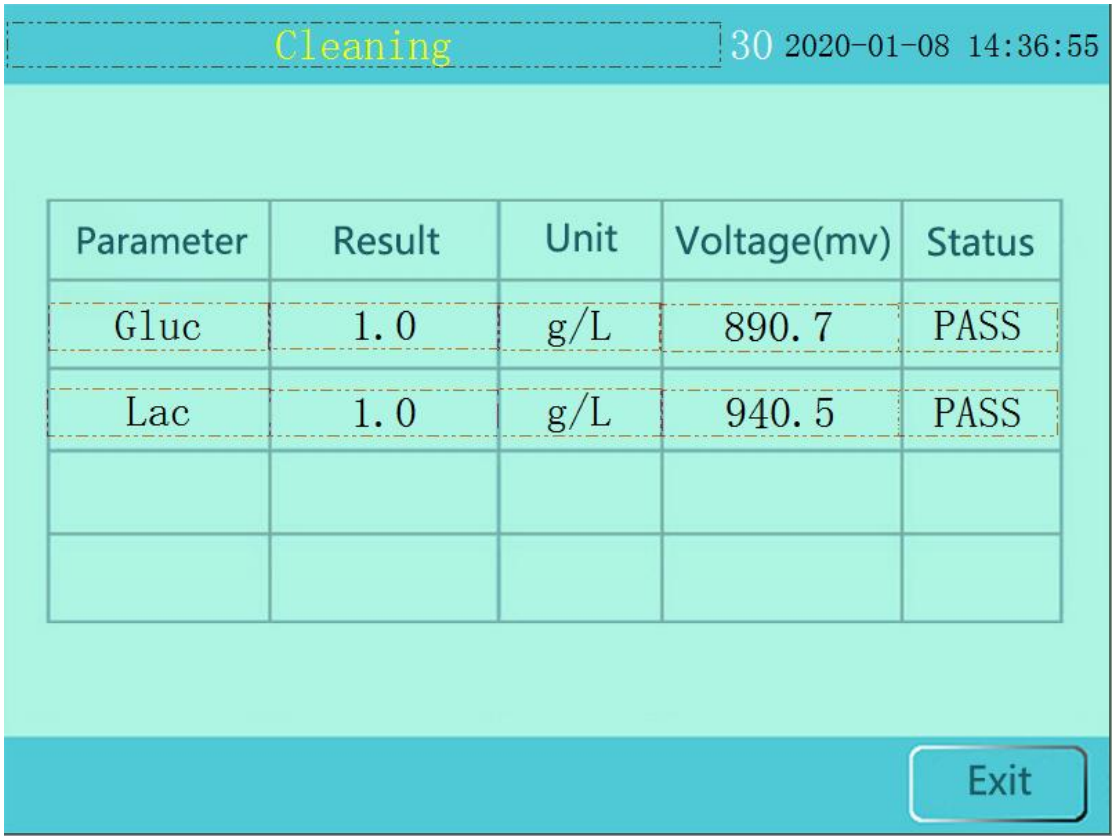
QC (Quality control): Test the performance of device with a specific concentration solution;

Data: Data query of calibration data, sample data, quality control data, data export and data transfer;

Setting: Set time, unit, test parameter, parameter option, print, display brightness, test mode, user mode, etc.;

Service: System self-test, device software version information, quality control calibration device, help, component detection, replacement of enzyme membrane, calibration coefficient setting, debugging tool, etc.

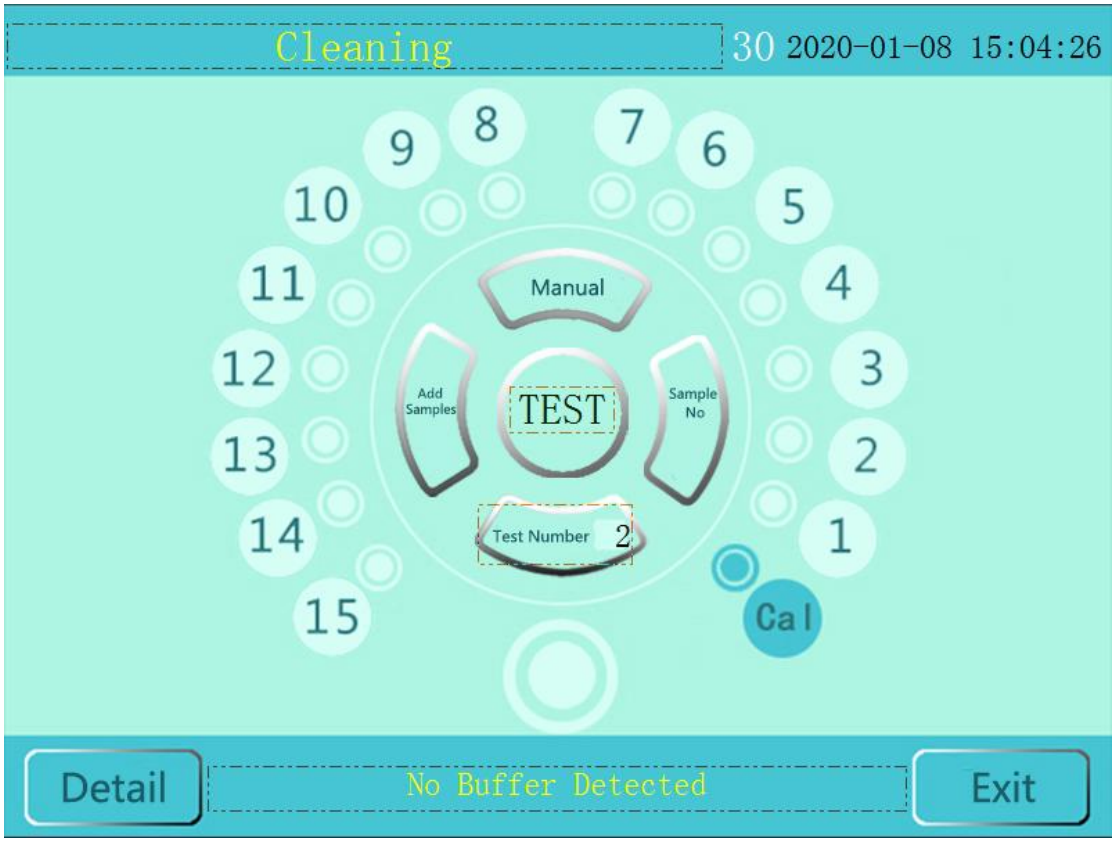
3. Calibration interface



Place the standard solution in the "CAL" cup position before calibration. The calibration process is divided into two processes: buffer zero (A standard) calibration and standard solution (B standard) calibration. The voltage value is displayed in the calibration process. The calibration result shows "Pass" in the status bar, which indicates that the calibration is done, otherwise the calibration fails. During the calibration process, click "Exit" to exit the calibration and return to the main menu interface.

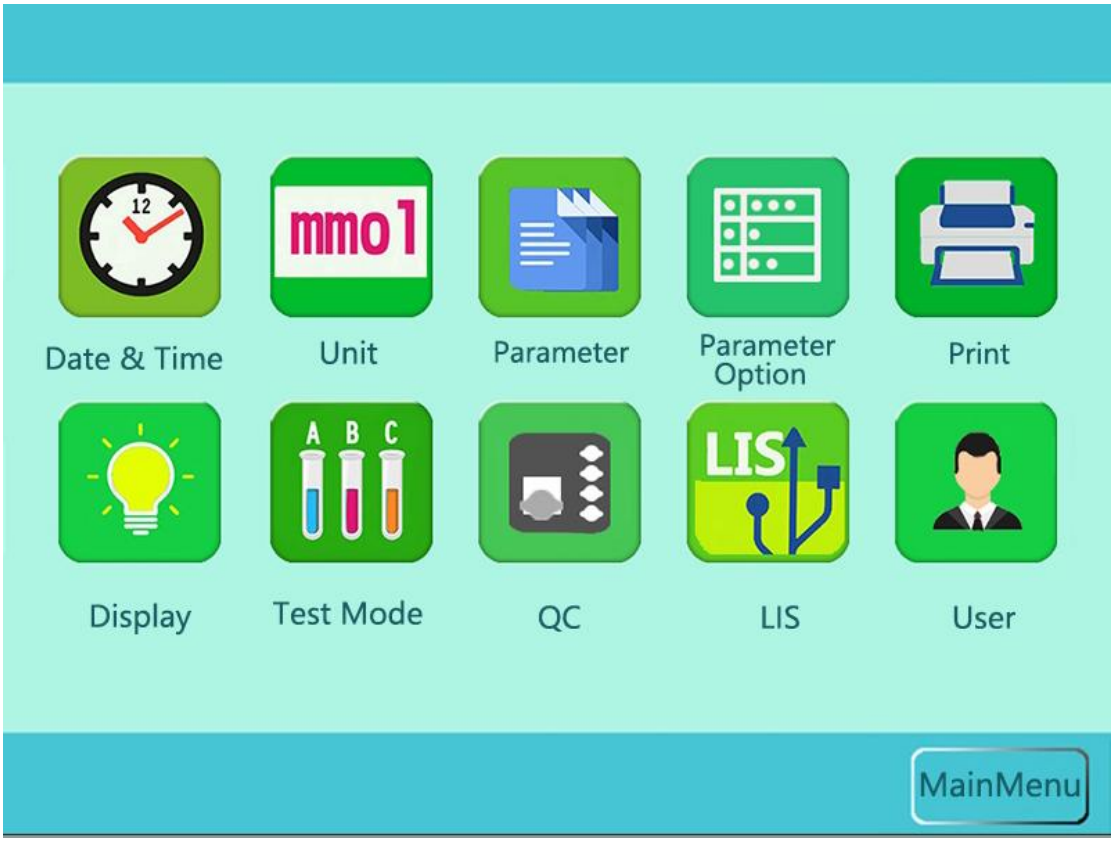
Note: When the enzyme membrane activities of methanol, ethanol, glycerol, etc. are relatively good, the voltage (mV) will exceed 2450. At this time, it is necessary to adjust the "Setting"-"Parameter Option"-"Sampling volume" lower appropriately.

4. Test interface



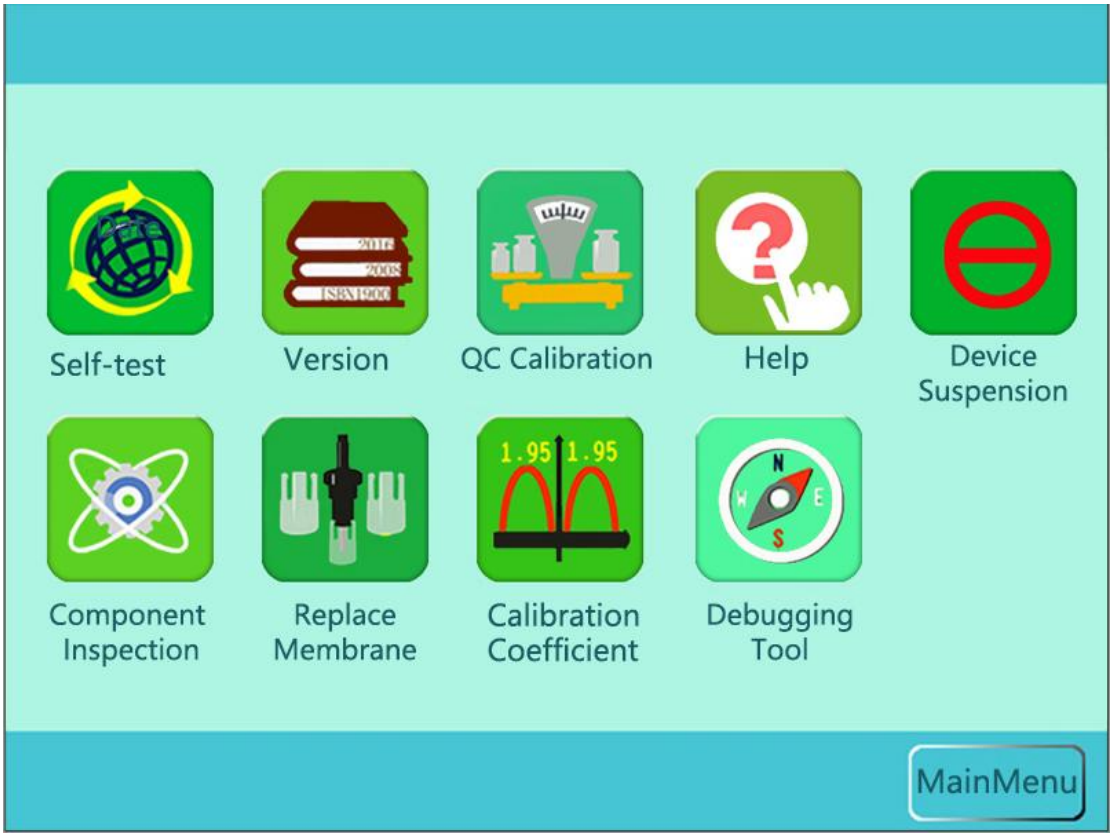
Before the test, place the standard solution in the "Cal" cup position, and place the test sample in the sample tray, and then click to select the corresponding cup position. The light blue color of the cup position indicates that the test cup position is selected. Then, click the "TEST" button starts the test. If the test for each sample is repeated for multiple times, click the "Test Number" input box to enter the settings. If the sample number is edited, click the "Sample No." button before testing to enter the sample number editing interface. There is multiple cup position selection function in this interface. If it needs to add more samples, place the sample to be tested in the sample tray, and then click "Add Samples". Click to select the corresponding cup position after the current sample test is completed, and then click "TEST" button to start the test. Click the "Detail" button during the test to view the test sample details. Click "Exit" during the test to exit the sample test and return to the main menu interface. When the sample volume is small, select the "Manual Aspiration" button to start the manual aspiration mode, which is the same as the automatic aspiration mode, to place the sample cup in the selected cup position in advance.

5. Setting interface



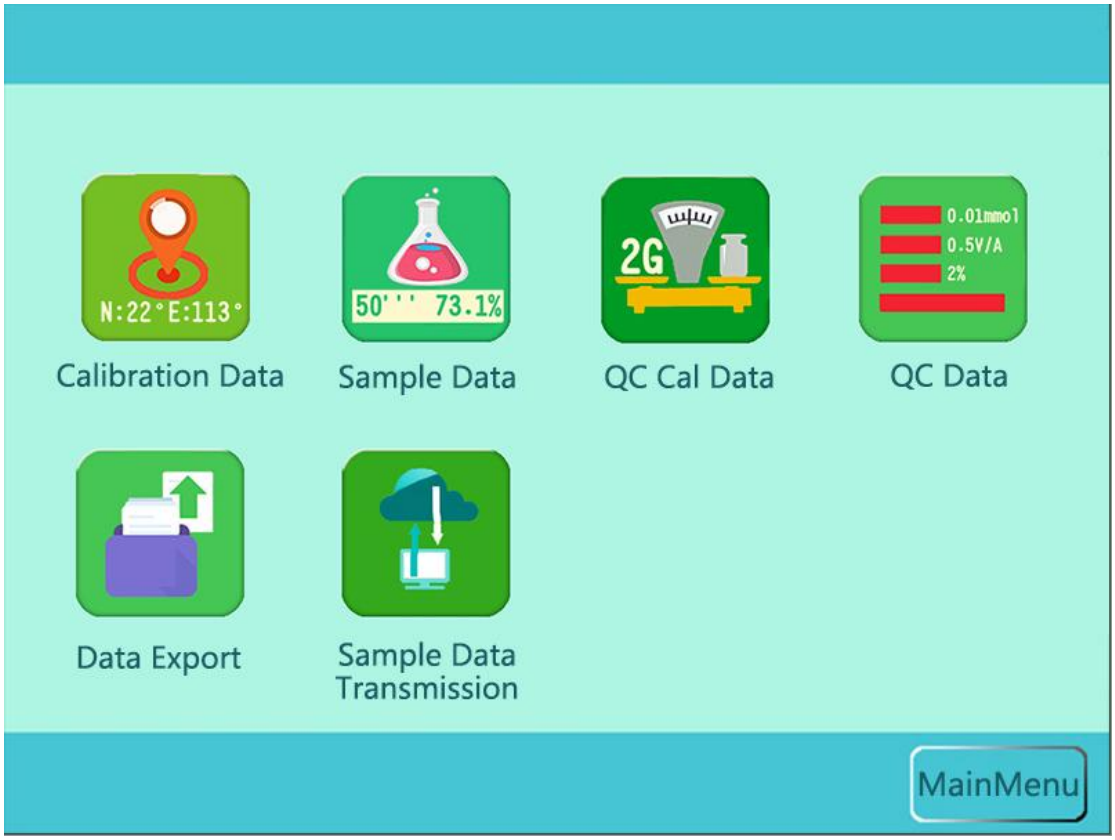
Date & Time: Set the system time;
Unit: Set the unit. There are four units can selected: "%", "g/L", "mmol/L", and "mg/dL".
Parameter: Set up a test parameter;
Parameter Option: Set the sample suction volume, zero voltage, maximum and minimum cleaning time, frequency parameters of calibration interval, and the depth of sampler;
Print: Set the thermal printer to be turned on and off, and set the tester and testing institution. When the tester and testing institution are empty, the tester and testing institution are not printed.
Display: Set the display brightness, screen saver brightness, and screen saver time;
Test mode: There are two optional test modes: "**precision mode**" and "**common mode**". Perform a calibration process for each sample tested during the test if the "**precise mode**" is clicked. Perform the calibration process is performed every 10 samples tested during the test if the "**common mode**" is clicked;
QC (QC rules): Set quality control rules on or off;
LIS (LIS interface): Set the network interface connection with the computer;
User: Three optional levels of user rights functions: "**debugger**", "**administrator**", and "**operator**"

6. Service interface



Self-test: Comprehensively test the entire device system;
Version: Display the device software version information and device code;
QC calibration: Calibrate the accuracy of device through three levels of quality control solution;
Help: Provide help for common operations;
Device Suspension: Perform this step to clean the flow path with pure water when the device is not used for a long time;
Component Inspection: Detecting the condition of the device module components;
Replace membrane: Replace the enzyme membrane;
Calibration Coefficient: Set the slope and mean difference of the device to correct the test accuracy of device;
Debugging Tool: Factory engineer debugging tool;

7. Data interface

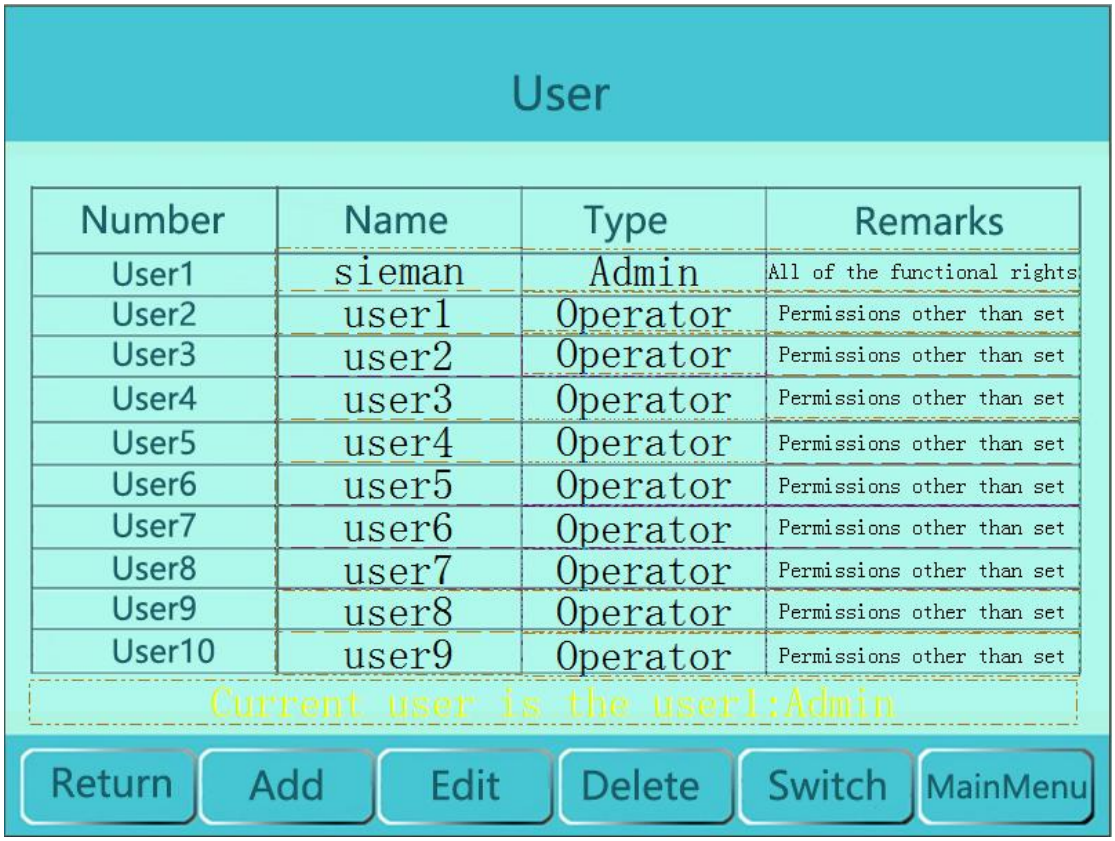


Calibration Data: Retrieve the calibration data based on date and calibration type;
Sample Data: Retrieve sample test data based on date, sample number and cup number;
QC calibration Data: Retrieve QC calibration test data according to date and QC level;
QC Data: Retrieve the quality control test data according to the date and quality control level;
Data Export: Export the calibration data, sample data, quality control data and quality control calibration data to a USB flash drive;
Sample Data Transmission: Transfer the sample test data to the computer through the RS232 serial port,

The serial port is set to 115200, 8, N, 1;

Note: The capacity of the USB flash disk used for data export should not be greater than 32G. The FAT16 or FAT32 shall be available for the file system when formatting. Other file systems are not currently supported.

8. User interface



This device contains three optional levels of user rights control: "**Debugger**", "**Administrator**" and "**Operator**";

"**Debugger**" is a first-level user, suitable for factory engineers, with all the functional rights of the device, but is not open to users;

"**Administrator**" is a second-level user, suitable for device management users, with device setup and management rights;

"**Operator**" is a third-level user, suitable for device operators, with basic device testing and data query rights;

This interface contains the user management functions, which can add, modify, delete and switch users;

Among them, the administrator has the right of adding, modifying, and deleting users. It is required to log in to the administrator user before operation.

The initial username and password for administrator are both "**sieman**";

This device contains an administrator that can modify but cannot delete;

This device contains 9 operator users that can be added, modified and deleted by the administrator user.

Chapter IV: Device Pipeline Cleaning and Maintenance

There are possible pipeline crystallization and blockage during long-term use of the device. It is recommended that the pipeline can be cleaned and maintained regularly every two months according to the following steps:

Note: After the device pipeline is cleaned and maintained, the enzyme membrane must be replaced again before the test sample can be measured!

1. Prepare 100ml cleaning solution (it is recommended to prepare by the producer), which can be prepared by users (use sodium hypochlorite with effective chlorine concentration of 0.5%);
2. Put the buffer tube into the prepared disinfection and cleaning liquid bottle;
3. Click "Service" and "Self-test" 5 times in turn on the main interface of the instrument;
4. Allow the cleaning liquid soak in the tube flow path for 10 minutes(The time depends on the severity of the blackening and blockage of the pipeline of the reaction pool, and the time for the blackening and blockage of the pipeline should be prolonged);
5. Prepare 100ml pure water at 50-80°C;
6. Place the buffer pipe into the prepared warm water bottle;
7. Click "Service" and "Self-Test" in turn on the main interface of device for no less than 8 times;
8. Put the buffer tube back into the original buffer bottle;
9. Click "Service" and "Self-test" in turn on the main interface of the instrument to complete the operation.

Chapter V: Device Failures and Troubleshooting

1. Common errors of device

When the device displays the following error message on the fault display, it is allowed to diagnose and eliminate the error according to the following table.

Error	Diagnosis	
Lost step of plunger pump	1. Click "Services" "Self Test" manually; 2. Enter "Service", "Component Inspection" and "Plunger Pump" for diagnosis and repair	
Zero position of plunger pump	1. Click "Services" "System Self Test" manually; 2. Enter "Service", "Component Inspection" and "Plunger Pump" for diagnosis and repair	
Display COMM Err	1. Manually click "Service" and "Self-Test"; 2. Contact the producer for more help information.	
Vertical zero error of sampling rack	1. Click "Services" "System Self Test" manually; 2. Go to "Service", "Component Inspection" and "Sampling Rack" for diagnosis	
Horizontal zero error of sampling rack	1. Click "Services" "System Self Test" manually; 2. Go to "Service", "Component Inspection" and "Sampling Rack" for diagnosis	
No buffer detected	1. Click "Service" and "Self-Test" manually. 2. Check whether the buffer solution in the reagent bottle is exhausted and replace the buffer solution	
No printer paper	1. Check if the printer paper runs out in the printer, and replace the printer paper	
The reaction cell is not in place	1. Check whether the reaction cell is pushed in place; 2. Enter "Service", "Component Inspection" and "Reaction Cell" for diagnosis	
Replace membrane	1. Check if the calibration solution is normal; 2. Check if the calibration voltage difference of the electrode is lower than 30; 3. Replace the enzyme membrane;	

2. Possible problems and solutions

Phenomenon	Possible Reasons	Solution
Stay in the calibration interface, but do not calibrate	The A standard voltage is too high and does not reach the calibration voltage value set by the instrument, which is generally less than 870mv	The device generally needs to wait 0.5-12 hours after replacing the enzyme membrane, and clean the A standard voltage with buffer solution
The A standard voltage stays above 1000mv, and voltage is not dropped after multiple clicks of cleaning	Incomplete electrode polarization	1. Install the electrode instrument and power on for more than 24 hours 2. If the voltage is still high, there may be problems with the electrode or electrode slot, contact the after-sales engineer 3. Remove the enzyme membrane and install the rubber ring to directly calibrate and observe the A standard voltage. If it is still high, contact the engineer; if it is normal, replace it with a new enzyme membrane and then calibrate
	The enzyme membrane is not in place, but is in a suspended state with the silver sheet, or there is air pressure between the enzyme membrane and the silver sheet	Press the enzyme membrane back into place with the flat head of the tweezers and install the electrode again
	Buffer solution preparation for more than 30 days, or split the bulk buffer solution	Prepare a new buffer solution according to the preparation requirements. Do not split the prepared buffer solution. 5L solution must be prepared at one time
Failure in multiple calibrations	Enzyme membrane has been used for more than 30 days or detection times are greater than 3000	Suggested replacement
Higher test results	Just installing the device or just changing the buffer solution, calibration or test without clicking 2 device self-tests	Click twice for the device self-test, in order to fill the pipeline with buffer solution and exhaust the air bubbles in the pipeline, so as to achieve accurate quantification of device
Lower test results	The white nut of electrode is not screwed in place, resulting in the	Unscrew the electrode from the reaction cell and reinstall

Unstable standard items being detected	electrode silver sheet not pressing against the enzyme membrane, and the enzyme membrane seal ring is not compressed to seal the reaction cell	
Large fluctuations in test results	Evaporation of water from standard items, or evaporation f methanol or ethanol from standard items	1. Click the self-test for multiple times, and then recalibrate 2. Replace with a new standard item
	Stirrer does not rotate or fails to rotate properly, resulting in uneven mixing of standard solution	1. Observe if the stir bar is operating normally, and contact the after-sales engineer 2.Clean the stirring bar reaction tank
	Air bubbles in the buffer line or reaction cell	Check the buffer line for air bubbles and loose connections
	The buffer overflowing from the black overflow cap of the reaction cell cannot be drained in time	Check the overflow hole and overflow pipe of the reaction cell for blockage
	The reaction cell cannot be filled with liquid	Check the tightness of the pump tube of the peristaltic pump
	Buffer solution	1. Whether the buffer solution pH value is normal 2. Whether the buffer solution expires
	The reaction cell is not clean	Scrub the inner wall of the reaction cell with a cotton swab
	The pipeline is not clean	Clean the pipeline
Message for replacing the enzyme membrane	Standard items expire	Replace with new standard items
	Enzyme membrane has been used for more than 30 days or detection times are greater than 3000	Replace the enzyme membrane
Calibration is easy to be passed, but there is a large gap between the test result and the theoretical value	Wrong enzyme membrane	Check that the color of the enzyme membrane is consistent with the color of the electrode wire markings.
No significant difference in measured values when testing samples with different concentrations	Sample concentration exceeds the test range of device	Dilute the sample to the test range of the device

Chapter VI: Sieman Consumables S/N

Enzyme Membrane	S/N
Glucose enzyme membrane [Note 1]	G1001
Glucose enzyme membrane [Note 2]	C1001
Lactase membrane	L1002
Glutamase membrane	G1003
Lysinase membrane	L1004
Methanolase membrane	M1005
Ethanolase membrane	E1006
Glutaminase membrane	G1007
Glycerase membrane	G1008
Xylase membrane	X1009
Sucrase membrane	Z1010

Buffer powder	S/N
Buffer powder ①(Applicable items: Glucose / Lactate / Glutamate / Lysine / Xylose / Sucrose, 1000mL Buffer can be configured)	B2001-1000mL
Buffer powder ①(Applicable items: Glucose / Lactate / Glutamate / Lysine / Xylose / Sucrose, 5000mL Buffer can be configured)	B2001-5000mL
Buffer powder ②(Applicable items: Methanol / Ethanol / Glucose / Lactate, 1000mL Buffer can be configured)	B2002-1000mL
Buffer powder ②(Applicable items: Methanol / Ethanol / Glucose / Lactate, 5000mL Buffer can be configured)	B2002-5000mL
Buffer powder ④ (Applicable items: Glycerol / Glucose / Methanol / Ethanol, 1000mL Buffer can be configured)	B2004-1000mL
Buffer powder ⑤（Applicable items: Glutamate/Glutaminel, 1000mL Buffer can be configured）	B2005-1000mL
Buffer powder ⑤（Applicable items: Glutamate/Glutamine, 5000mL Buffer can be configured）	B2005-5000mL

Standard Solution	S/N
Glucose / Lactate / Glutamate	D3001
Glucose / Lactate / Glutamate / Glycerol	D3002
Glutamine	S3009
Glucose 2g / Lactate / Glutamate	D4001
Glucose / Lactate / Glutamate / Lysine	D4002
Glucose 2g / Lactate / Glutamate / Lysine	D4003
Glucose / Lactate / Glutamate / Glycerol / Methanol	D4004
Glucose / Lactate / Glutamate / Glycerol / Ethanol	D4005
Glucose 2g / Lactate / Glutamate / Glycerol / Methanol	D4006
Glucose 2g / Lactate / Glutamate / Glycerol / Ethanol	D4007
Xylose	D4012
Sucrose	D4015

Name	S/N
57 Printer paper	PJ-DYZ-001
Biochemical item electrode	DJ-SH-001
Peristaltic pump tube 2*4*80	LL-RDBG-001
Two channels' stirrer	PJ-JBZ-001
Three channels' stirrer	PJ-JBZ-002
Two channels' overflow cap	PJ-YLM-001
Three channels' overflow cap	PJ-YLM-002
Sampling needle	PJ-CYZ-001

Note 1: Suitable for fermentation industry, the measurement range is 0.05~1g/L, and the cleaning time is 25 seconds;

Note 2: Suitable for cell culture industry, measuring range is 0.3~9g/L, and the cleaning time is 40 seconds.

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