Preparing the pure water container

1. Ensure that the pure water contained is sufficient.

   Warning

   Insufficient pure water will result in sequencing failure.

   For details about pure water consumption, refer to the relevant reagent kit user manual. For details about maintaining the pure water container, refer to *Maintaining the pure water container on Page 51.*

2. Connect the pure water container to the device.

   1) Place the fixing plate on the lid and align the holes. Insert the pure water tube into the pure water container through the aligned holes until the tube reaches the bottom of the container.

      Ensure that the tube goes through the handle, as shown in the figure below.

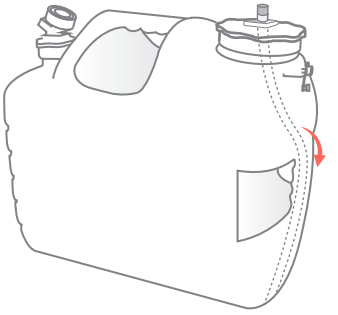

Figure 14 Inserting the pure water tube

   2) Secure the fixing plate and lid.

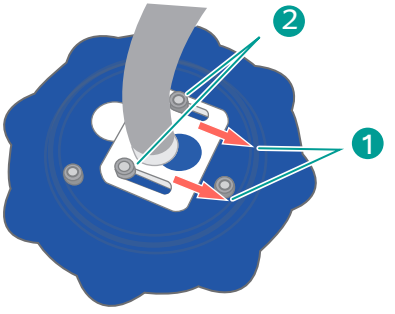

Figure 15 Securing the fixing plate and lid

3) Open the airway.

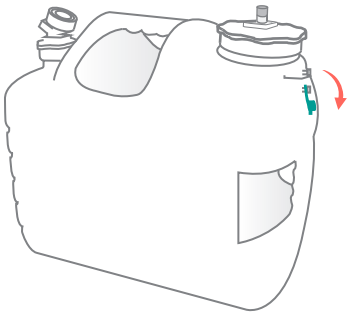

Figure 16 Opening the airway

3. If you need to add pure water into the pure water container during sequencing, perform the following steps:

   1) Open the lid in position 1 according to the direction indication on the lid.
   2) Insert the water output tube of the pure water machine into the pure water container through the water inlet in position 2.

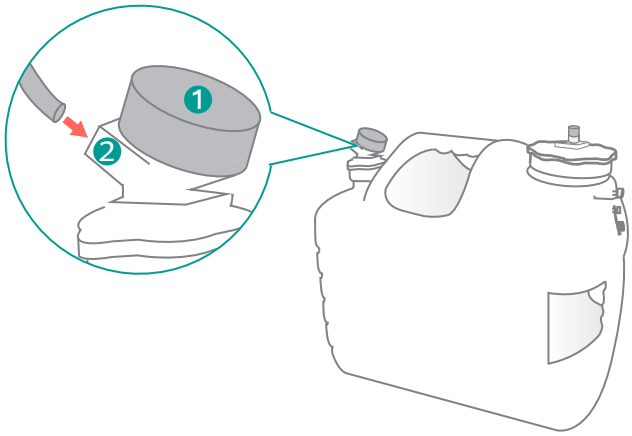

Figure 17 Adding pure water during sequencing

   3) Fill the pure water container with fresh pure water.
   4) Remove the water output tube of the pure water machine from position 2 and secure the lid in position 1.

Preparing the waste container

The waste container is connected to the device through the tubes. Ensure that the space is sufficient before connecting the waste container to the device. When the space is insufficient, replace the waste container.

For details about estimating the space, refer to the relevant reagent kit user manual. For details about replacing the waste container, refer to *Replacing the waste container on Page 51.*

Sequencing

This chapter describes the sequencing workflow and washing procedures. Read and follow the instructions to ensure correct operations.

Workflow

Log in

Select a flow cell stage

Load the reagent cartridges and flow cell

Review parameters

Perform a sequencing run

Automatic post-wash

- Chemicals in reagents and waste might cause personal injury through contact with the skin, eyes, and mucosa. Follow the safety standards of your laboratory and wear protective equipment (such as laboratory coat, and disposable bouffant cap, protective glasses, mask, gloves, and shoe covers) when performing a sequencing run.
- When the waste reaches the specified limit before or during sequencing, dispose of the waste according to local regulations and your laboratory safety standards. Wear protective equipment (such as laboratory coat, and disposable bouffant cap, protective glasses, mask, gloves, and shoe covers) when handling the waste. Personal injury might be caused by contact with the skin, eyes, and mucosa.

Logging in

NOTE You can perform the sequencing and wash procedures only after you log in to the control software.

Perform the following steps:

1. Power on the device.
2. Log in to the computer with the password that are provided by the manufacturer.
3. Tap in the main interface.

4. Log in to the control software with the user name and password that are provided by the manufacturer.

Selecting a flow cell stage

In the operation area of the main interface, select a flow cell stage.

Loading the reagent cartridge

Perform the following steps:

1. Prepare the reagent cartridges, including the sequencing cartridge and washing cartridge.

   For details about preparing the reagent cartridge, refer to the relevant reagent kit user manual.
2. Open the reagent compartment door.
3. Open the sequencing cartridge compartment door by holding its handle and pulling down. Push the sequencing cartridge in the direction of the arrow shown on the cartridge into the reagent compartment until it stops. Close the sequencing cartridge compartment door.
4. Pull out the drawer, put the washing cartridge in the direction shown on the cartridge into the drawer, and push the drawer into the reagent compartment until it stops.
5. Close the reagent compartment door.

Loading the flow cell

Perform the following steps:

1. Tap **Sequence** and select **New run** or **Resume run**, the flow cell drive automatically ejects.

   Or tap the flow cell drive button on the device to eject the flow cell drive manually.
2. Put a new sequencing flow cell on the flow cell drive according to the direction indication on the flow cell and tap the flow cell drive button to retract.
3. The system automatically identifies the IDs of the flow cell and reagent cartridges.

   If RFID scanning fails, input the ID with the on-screen keyboard.

Figure 18 Sequencing information input interface

NOTE

- Ensure that the ID format is correct when you input ID manually. Otherwise, you will be prompted that the ID is incorrect and the procedure cannot continue.
- The ID of the reagent cartridge consists of the 10-digit catalogue number and 11-character serial number.
- If the flow cell accidentally drops to the floor and breaks, handle with care in case of personal injury.

4. Tap the **Recipe** box and select a recipe from the list.

   To customize a recipe, select **Customize a recipe** and set the **Recipe name**, **Read length**, and **Dark reaction cycles**.

Figure 19 Customizing a recipe

NOTE The recipe name must be unique.

5. Select a barcode range from the list on the right of the **Recipe** box.

   If you need to import Barcode files, select **Import** from the list.

6. Tap **Advanced settings** and you can enable **Custom primers** and **Auto wash** if needed.

   In the sequencing process, you can tap to enable or disable **Auto wash** if needed.

7. Tap **Next**.

   If any error prompts occur, follow the on-screen prompt to solve the problem and tap **Next** again.

Reviewing parameters

Carefully check each item in the review interface, and do one of the following:

- If you find any error, tap **Previous** to return to the previous interface and reset parameters.
- If all parameters are correct, tap **Start**. Ensure that the pure water volumn is sufficient and tap **Continue**. The software automatically checks whether system modules are working properly.
  - ➢ If all modules are working properly, the system automatically starts a sequencing run.
  - ➢ If the system prompts that the storage space is insufficient, solve the problem and tap **Start** to check again.

    If other problem occurs, contact the technical support.

Performing a sequencing run

- Ensure that all compartment doors are closed. Sequencing run cannot be started when the reagent compartment door is open.
- Only open the reagent compartment door when necessary to avoid adverse effects on sequencing results or even damage to the device.
- Do not bump, move, vibrate, or impact the device during sequencing. Otherwise, sequencing results might be inaccurate.
- Pay special attention to the LED status bar, icons, and prompts. If errors occur, a message appears on the screen. Follow the prompt to troubleshoot the problem. For information about the troubleshooting, refer to *Troubleshooting on Page 52*.

The following table describes the function of each item in the interface:

Item	Description
Estimated completion time	Shows the estimated time when sequencing completes.
QC type	You can select a QC value graph from the QC type list to assess the sequencing quality.
❚❚	Tap it and a confirmation dialog box appears. Select **Yes** to pause sequencing. Tap it again and a confirmation dialog box appears. Select **Yes** to resume sequencing.
■	Tap it and a confirmation dialog box appears. Select **Yes** to stop sequencing.
Ⓕ	Tap to view the First Base Report.
≡	Tap to view the summary after a sequencing run completes.
⌘	Tap to view sequencing information after a sequencing run starts.

Automatic post-wash

Auto wash is enabled by default. The system automatically performs a post-wash after each sequencing run.

During troubleshooting, you can set **Auto wash** to **No** when necessary and perform a wash manually right after the troubleshooting. For details about how to perform a wash manually, refer to *Performing a wash on Page 50.*

Disposing of reagent cartridge and flow cell

Warning After sequencing and post-wash, recycle the used flow cells from the flow cell retrieval compartment. Before powering off the device, check whether the used flow cells are recycled.

After sequencing and post-wash, or before powering off the device, perform the following steps:

1. Wear protective equipment.

2. Open the flow cell retrieval compartment and remove the flow cell.

   Used sequencing flow cells function as washing flow cells. The washing flow cell can be reused for three times. Dispose of the flow cell according to local regulations and safety standards of your laboratory.

3. Open the reagent compartment door and remove the reagent cartridges.
4. Empty the remaining solution in the reagent cartridge into an appropriate waste container.
5. Dispose of the flow cell and reagent cartridges in accordance with local regulations and safety standards of your laboratory.

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Maintaining the device

This chapter describes maintenance procedures of the device and its parts. Perform maintenance regularly to ensure that the device runs smoothly.

Maintaining the main unit

Daily maintenance

- Perform the following maintenance when the device is powered on:
  - ➢ Check whether the fan at the rear of the device is operational. If not, contact the technical support.
  - ➢ During sequencing, pay attention to error messages and check whether the relevant parts can work properly. Contact the technical support if needed. For information about how to find error messages, refer to *Menu area on Page 23*, and *Log interface on Page 25*.
- Clean the interior of the reagent compartment before sequencing.
  1) Power off the device, open the reagent compartment, open the sequencing cartridge compartment door and pull out the washing cartridge drawer.

     For details about powering off the device, refer to *Powering off the device on Page 32*.
  2) Clean the interior of the reagent compartment with a 75% alcohol wipe. Ensure that the surface is free of DNBs, reagents, blood, and saliva.

Weekly cleaning

Warning

- We do not recommend that you use other disinfectants or wash solutions except for those that are mentioned in this manual. Because other solutions are not verified for use and their effects to the device are unknown.
- If you have questions about the compatibility of wash solutions, contact the technical support.

Perform the following steps:

1. Power off the device and open the reagent compartment.

   For details about powering off the device, refer to *Powering off the device on Page 32*.
2. Clean the touch screen and exterior of the reagent compartment door, sequencing cartridge compartment door, and washing cartridge drawer with a 75% alcohol wipe. Ensure that the surface is free of DNBs, reagents, blood, and saliva.

Monthly cleaning

Warning

- We do not recommend that you use other disinfectants or wash solutions except for those that are mentioned in this manual. Because other solutions are not verified for use and their effects to the device are unknown.
- If you have questions about the compatibility of wash solutions, contact the technical support.

Perform the following steps:

1. Power off the device and open the reagent compartment.

   For details about powering off the device, refer to *Powering off the device on Page 32.*

2. Clean the surface of the device with a 75% alcohol wipe. Ensure that the surface is free of DNBs, reagents, blood, and saliva.

Maintaining the power supply

- When the device is not in use for seven days or longer, perform a wash manually according to the relevant reagent kit user manual. Turn off the device after the wash.

  For details about powering off the device, refer to *Powering off the device on Page 32.*

- Check whether the power cord and cables are in good condition regularly. Contact the technical support if new cables are required.

Maintaining the software

After the receival of *Release Notification*, contact the technical support to update the software.

Performing a wash

Chemicals in reagents and waste might cause personal injury through contact with the skin, eyes, and mucosa. Follow the safety standards of your laboratory and wear protective equipment (such as laboratory coat, and disposable bouffant cap, protective glasses, mask, gloves, and shoe covers) when performing a sequencing run.

Warning

- We do not recommend that you use other disinfectants or wash solutions except for those that are mentioned in this manual. Other solutions are not verified for use and their effects to the device are unknown.
- If you have questions about the compatibility of wash solutions, contact the technical support.

You can perform a wash to remove the remaining reagents from the fluidics lines and flow cell stages, and avoid cross-contamination.

When **Auto wash** is enabled, the system automatically performs a wash after each sequencing run. If **Auto wash** is set to **No** or the device is not used for 7 days or longer, perform a wash manually.

Wash solutions that can be used include:

- 1 M NaCl and 0.05% Tween-20
- 0.1 M NaOH
- Laboratory-grade water

NOTE You can use laboratory-grade water such as 18 Megohm (MΩ) water, Milli-Q water, Super-Q water, or similar molecular biology-grade water.

Perform the following steps:

1. Before sequencing, log in to your account. Tap **Wash** in the main interface of the flow cell stage.
2. Prepare the washing cartridge.

   For details about preparing the reagent cartridge, refer to the relevant reagent kit user manual.
3. Follow the on-screen steps to load the washing flow cell, washing cartridge, and an empty sequencing reagent cartridge. Close all compartment doors.

   For details, refer to *Loading the flow cell on Page 41* and *Loading the reagent cartridge on Page 41*.
4. In the wash interface, tap **Wash** and a confirmation dialog box appears. Select **Yes** to start wash.

   ➢ Tap ❚❚ to pause, and tap it again to resume wash.

- Tap ■ and a confirmation dialog box appears. Select **Yes** to stop wash.

5. After wash, tap **Finish** to return to the main interface.
6. Remove the washing flow cell, sequencing cartridge, and washing cartridge.
7. Store the washing flow cell at room temperature.

   The washing flow cell can be reused for only one month. Dispose of the flow cell according to local regulations and safety standards of your laboratory.
8. Empty the remaining solution in the washing cartridge into an appropriate waste container.
9. Dispose of the washing cartridge according to local regulations and safety standards of your laboratory.

Maintaining the pure water container

Perform the following maintenance every week:

1. Empty the pure water container.
2. Spray 75% alcohol onto the inner surface of the lid and the surface of the pure water tube, and then wipe them with a clean cloth.
3. Add sufficient laboratory-grade water into the pure water container, and attach the lid back onto the container.
4. Gently swirl it until all inner walls are cleaned.
5. Empty the pure water container.
6. Repeat steps 3 to 5 twice.

Replacing the waste container

Chemicals in reagents and waste might cause personal injury through contact with the skin, eyes, and mucosa. Wear protective equipment (such as laboratory coat, and disposable bouffant cap, protective glasses, mask, gloves, and shoe covers) when handling the waste. Personal injury might be caused by contact with the skin, eyes, and mucosa.

The waste container is connected to the device through tubes. To avoid liquid leakage and biological hazard, monitor the waste container status frequently and dispose of the waste and waste container in time when the waste reaches the maximum volume.

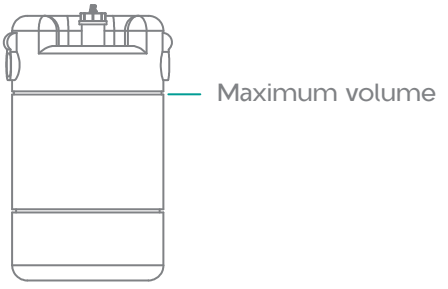

Figure 20 Maximum waste volume

Perform the following steps:

1. Wear protective equipment.
2. Remove the lid with tubes from the waste container, install a new lid with sealing gasket, and secure the lid until you hear a click.
3. Dispose of the waste and waste container according to local regulations and safety standards of your laboratory.

Troubleshooting

If malfunction occurs during operation, the device beeps or a message is displayed on the screen. Follow the prompt to troubleshoot and solve the problem. The following table lists some of the problems and possible solutions. If you need additional assistance, contact the technical support.

Table 4 Troubleshooting

Problem	Possible cause	Recommended action
After turning the power switch to ON position, I cannot turn on the device.	• The mains supply is abnormal. • The device is not connected to the mains supply or UPS. • The UPS runs out of power.	1. Check whether the mains supply and UPS is normal. 2. Ensure that the device is connected to the mains supply or UPS. 3. If the problem persists, contact the technical support.

Problem	Possible cause	Recommended action
Error messages appear when the control software runs.	• The parameters are not set properly. • Errors occur when the software communicates with hardware.	1. Perform a self-test in the maintenance interface. Check the record of the hardware that fails the self-test. 2. Check error messages in the log, and solve the problem according to on-screen instructions. 3. Restart the device. 4. If the problem persists, contact the technical support.
Temperature error message and warning appears in the sequencing interface.	• The temperature exceeds the preset limits. • Temperature sensor error.	Record the warning and logs of this run and contact the technical support.
Waste level sensor alarms.	• The waste level exceeds the preset limits. • The level sensor is not installed properly. • The level sensor is damaged.	Record the warning and logs of this run and contact the technical support.

Transportation and storage

- For information about the environmental requirements for storing the device, refer to *Specifications on Page 57*.
- If you want to move or transport the device, contact the technical support.

Disposal of the device

The service life of this device is seven years, which is determined by the simulated service life evaluation method. For the date of manufacture, refer to the label on the device. Perform the maintenance according to the requirements mentioned in this manual. Dispose of the end of life device according to local regulations. Or, if the device is confirmed that it still can work safely and effectively after maintenance, keep the device.

Appendixes

This chapter provides additional important information about the device.

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Specifications

Item	Description	
Laser classification of the device	Class 1 laser product	
Dimensions	1656 mm (W) × 1815 mm (H) × 903 mm (D) (65.2 inches × 71.5 inches × 35.6 inches)	
Net weight	Approximately 765 kg (1687 lb)	
Touch screen	Type	LCD
	Size	20 inches
	Resolution	1920 × 1080 pixels
Power	Voltage	200 V to 240 V~
	Frequency	50/60 Hz
	Rated power	3000 VA
	Overvoltage category	II
	Cable	min.10AWG
Maximum sound pressure level	75 dB	
Degrees of protection provided by enclosures (IP Code)	IPX0	
Accompanying items	Refer to the packing list	

Item	Description	
Operating environment requirements	Temperature	19 ℃ to 25 ℃ (66 ℉ to 77 ℉)
	Relative humidity	30% RH to 80% RH, non-condensing
	Atmospheric pressure	80 kPa to 106 kPa
	Altitude	≤2000 m
	Pollution degree	2
	Indoor use	
	NOTE Because the temperature and humidity fluctuations influence the accuracy of the experiment results, we recommend that you install an air conditioning system and a humidifier or dehumidifier in the laboratory to maintain the temperature and humidity.	
Transportation/ Storage environment requirements	Temperature	-20 ℃ to 50 ℃ (-4 ℉ to 122 ℉)
	Relative humidity	15% RH to 85% RH, non-condensing
	Atmospheric pressure	80 kPa to 106 kPa

Compliance information

The device complies with the following standards:

Item	Standard
Electromagnetic Compatibility (EMC)	IEC 61326-1:2020 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
Safety requirements	• IEC 61010-1:2010+AMD1:2016 Safety requirements for electrical equipment for measurement, control, and laboratory use-Part 1: General requirements • IEC 61010-2-081:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes • IEC 61010-2-010:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-010: Particular requirements for laboratory equipment for the heating of materials • IEC 60825-1:2014 Safety of laser product part 1: equipment classification and requirements

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Index

A

anti-shock and anti-tilt labels 33
antivirus software 31

B

Biological safety 6

C

combinatorial probe-anchor synthesis (cPAS) 12

E

empty the fluidics line 27

F

Flow cell 18
Flow cell drive 16
    Flow cell drive button 15
Flow cell retrieval compartment 16

H

Host power button 17

L

LED status bar 16

M

Main interface 22
Maintenance 27

N

Network requirements 30

P

Performing a wash 50
  Washing cartridges 35
peripheral devices 34
Pollution degree 58
Power switch 21

R

Reagent cartridge and sequencing flow cell 35
Reagent compartment 18

S

safety information 1
Self-test 21
sensor status indicators 24
Settings interface 26

T

Troubleshooting 52

W

Workflow 40