Laboratory Equipment Manufacturer
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INSTRUCTION MANUAL FOR

UT-2600C

Medical ELISA Washer

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION

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How to use the manual

General

Welcome to be the user of 2600C.

This manual is a user's guide for 2600C Medical Elisa Washer, which includes system installation, operating procedures, parameters setting and basic maintenance. Reading the manual carefully before operation is strongly recommended.

Instruments with different software versions will have some different functions; this manual describes the 2600C Washer system and its software version

If you have any problem, please contact your supplier for help.

Please keep all the original package for the future use of transportation, store and back to factory.

Symbols description

Symbols in the manual

NOTE!

Notes contain additional information or tips when using the instrument.

ATTENTION! Cautions

Cautions should be followed carefully to ensure your instrument work correctly and to avoid unnecessary personal injury.

Precautions

General

Before you start installing and working with the washer you should read the safety precautions and regulations shown in this chapter.

Operator Qualification

Please note that the operation with washer should be carried out only by the doctor or clinical inspector who have undergone necessary training provided by the sales agent.

Service Technician Qualification

• install, maintain and repair the instrument, a service technician has to be trained on the instrument by the manufacturer or their representative. A service technician is also expected to be familiar with the normal operation of the instrument as described in the User's manual and the special operations as described in the service manual.

ATTENTION! Cautions

Electrical

To use washer safely, pay attention to the following items:

To prevent the risk of electrical shock and/or damage to the instrument Operator should not open the cover of the instrument. Only authorized personnel, for example, service technicians, may open the instrument to perform maintenance or repair.

Touching the main board when the power is on may cause severe injury or death. Any problem, please ask for helps from your supplier.

Mechanical

Pin tips are sharp and may cause bodily injury. Do not place hands or fingers under the pins while the instrument is in operation. Always set the power switch to OFF before changing the wash-head. Never touch the pins while the instrument is operating.

The bottles

If the washer is giving out a warning that the waste bottle is full during the operation, immediately set the power switch to OFF. Then you can disconnect the bottle and pour away the waste liquid. The bottles are pressurized during normal operation. Do not remove bottle caps or tubing connections while the bottles are pressurized. Set the power switch to OFF before changing bottles or tubing connections.

If the waste bottle overturns while the instrument is running, immediately set the power switch to off. At this situation, the washer may give out some waste liquid through the waste bottle from a device at the bottom of the instrument. They must be treated as biohazardous materials.

Biohazardous Materials

Some diagnostic assays utilize material which is potentially biohazardous. Always wear protective apparel and eye protection while using this instrument, Always operate the instrument with the aerosol shield lowered.

Waste liquid

Avoid direct contact with waste solution and/or solid waste. Both should be handled as potentially biohazardous.

Dispose of waste solution and/or solid waste according to the relevant governmental regulations.

Consult the reagent manufacturer for information on the concentrations of heavy metals and other toxic constituents in each reagent.

Biohazardous parts

Avoid direct contact with the microplate and the work area. Treat these areas as potentially biohazardous and /or infectious

Chapter 1 Introduction

1.1 Intended Use

The Microplate Washer is designed for use in processing enzyme-linked immunosorbent assays ("ELISA " or "EIA"), including clinical diagnostic assays, requiring multistep washing, rinsing, and soaking. This general-purpose instrument is intended to be used by laboratory professionals who are capable of selecting the appropriate features and opinions for each specific clinical application.

ATTENTION! Cautions

Warning: Only qualified personnel should perform service procedures.

1.2 Description

The 2600C is a microprocessor-controlled microplate washing system that performs wash protocols defined by the user. The instrument will accept micro wells having flat-, round-, or v-bottom configurations. It is designed to wash all of the wells in one column or one row of a 96-well plate at once. The washing protocol can be programmed so that all of the columns (or rows) are washed in the same manner. Or different wash cycles can be applied to specified columns (or rows) on the plate. It can store up to 50 user define programs.

Feature of the washer:

1) Large screen for display, graphical interfaces.
2) It accept microplate have flat-,round-,or v-bottom, including 8×12,8×6,12×4 microplates.
3) Users can program and store them discretionarily.
4) It is easy to program. Users can set wash times, fluid volume, and soak time discretionarily. You can set wash by row or plate; also you can skip some rows.
5) Full automatic washing procedure. Auto orientation. Uses can do manual adjustment to ensure precision.
6) Long and short pin designed for wash-head, which to reduce cross pollution.
7) The waste bottle can auto detect the liquid and give out warning when it is full.
8) Three wash bottle channel, easy to switch.
9) You can select 8 or 12 channel wash-head.
10) When connected with 2100C reader, can perform long-distance diagnosis and upgrade.

1.3 Washer Principle

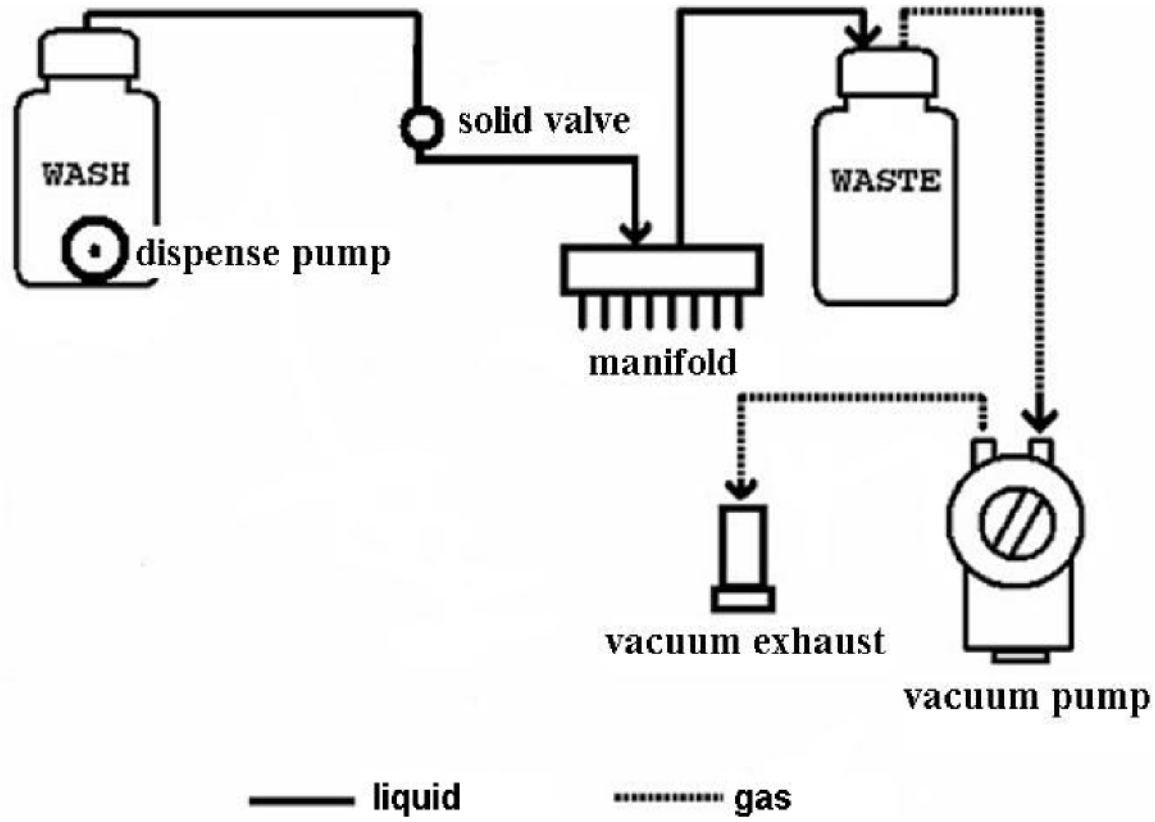

Figure 1.1 washer principle

Wash bottle, solid valve, dispense pump, wash-head compose the dispense tube path of 2600C. First the wash solution is pump from the wash bottle, the solution was dispense to the cuvette by short pins, and then the wash liquid is aspirate from the cuvette by the long pins, at the end the waste liquid was pumped into the waste bottle by the vacuum pump. The dispense pump outside is used for sucking the wash solution, and the solid valve the control of wash solution for cuvettes.

The vacuum pump suck the air in the waste bottle, then vacuum appear from the waste bottle to the long pins of the wash-head, and then waste liquid is aspirated.

1.4 Hardware Components

Hardware components of the 2600C are shown in Figure 1.

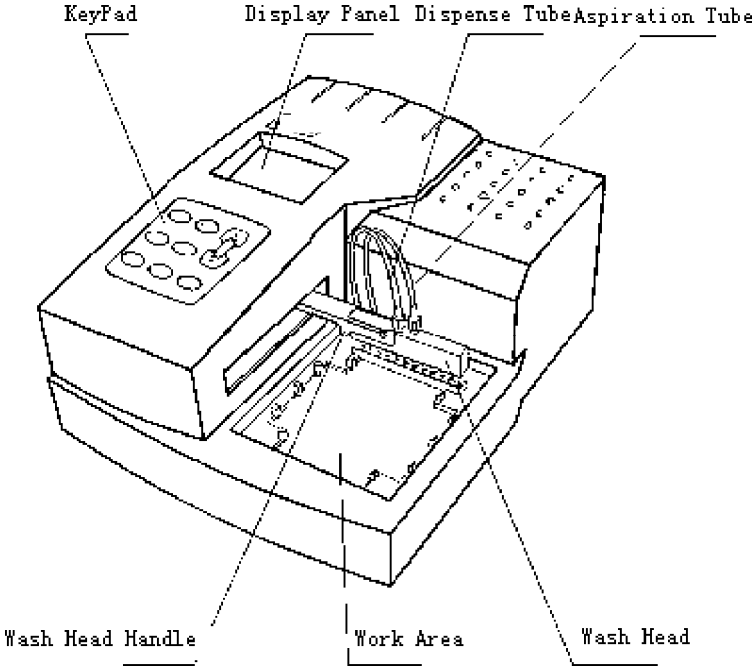

Figure 1.1 The 2600C systems

Wash-head. The wash-head contains a set (1 x 8 or 1 x 12) of dual Wash pins. Each set of wash pins includes a dispense pin and an aspirate pin, closely spaced so that fluid can be aspirated from a well while fluid is dispensed into the same well .The wash-head moves back and forth to wash each row (or column, depending on the wash-head used) of the plate by lowering the wash pins into the corresponding wells.

Display Panel. The system communicates with the user by display. All system information and wash parameters entered by the user are displayed.

Keypad. The keypad is used by the operator to select commands and input wash parameters.

RS232 Interface The system includes an RS232 interface so that an external computer can be connected for technical service purposes in the future, the RS232 interface may be used for updating new version software.

Wash Bottle. The wash bottle contains the wash fluid used for Dispensing, Filling and Purging with a dispense pump inside.

Waste Bottle. The waster bottle contains the fluid aspirated from the wells with a level sensor inside.

Connectors at the rear of the 2600C system are shown in Figure 2.
Connections for the power cord, the dispense pump power connector, the waste bottle level sensor, the waste bottle vacuum line and the external computer are shown at the rear of the panel.

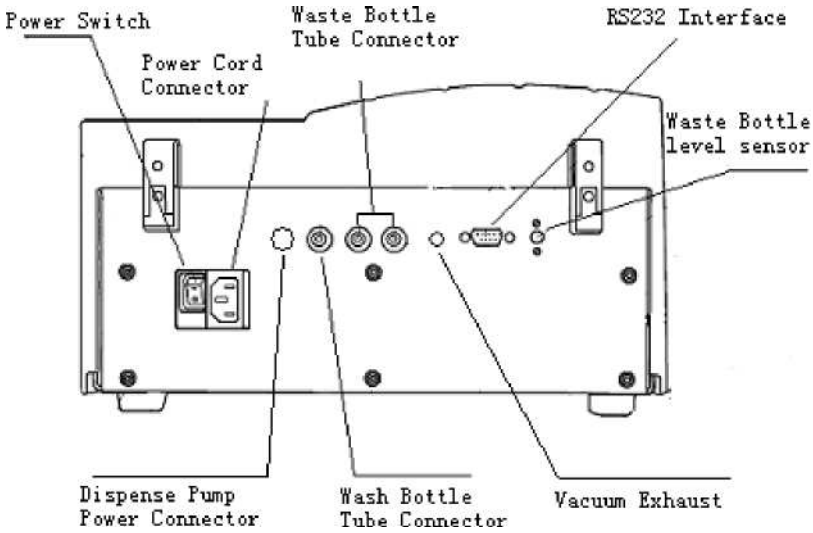

Figure 1.2 Rear View of the 2600C system

1.5 Key Pad

Figure1.3 Keypad

Description	
PRIME	Start Prime procedure
RINSE	Start Rinse procedure
DISP	Start Dispensing procedure
ASPR	Start Aspiration procedure
SELECT	Change edit item
START	Start wash procedure~ Go to next operation
CANCEL	Cancel current operation~~ Double click to enter system setting
~	Change parameter
~	Change parameter

Chapter 2 Installation

2.1 Unpacking

- Carefully unpack the instrument and remove it from the plastic bag.
- Place 2600C on a flat working surface.
- Place the wash bottle and waster bottle behind 2600C
- Remove the power cable and other items from the packing carton.
- Check the components: User's Manual, Analysis Certificate / packing list ,Accessories (power supply cable, fuse, tube etc)

NOTE!

- ***Report any visible damage to your shipper or freight carrier at once.***
- ***Retain the original packing material for future use in the event that the instrument is placed in storage, shipped to another location or returned for repair.***

2.2 Environmental Requirements

Locate 2600C to avoid exposure to excess dust, vibrations, strong magnetic fields, direct sunlight, draft, excessive moisture or large temperature fluctuations. Leave sufficient clearance (10 cm) at both sides of the unit for adequate air circulation.

ATTENTION! Cautions

Instrument be operated within an ambient temperature range of 10ć -40ć humidity of 20%-85%.

2.3 Power requirements

- **AC200V – AC240V**
- **50 - 60Hz**
- **150W**

ATTENTION! Cautions

- ***Ac power must be grounded at the main socket. Interruption of the protective conductor inside or outside the instrument or disconnection of the protective conductor terminal may make the instrument dangerous.***
- ***The circuit used should be substantially free of large transients such as large pumps, large centrifuges. Etc.***
- ***If found smog, strange sound in instrument, please turns instrument off immediately and contact your dealer.***
- ***Use only the fuse type and rating specified for this product.***

Connect the supplied power cable to the rear of the instrument as shown. Plug the other end of the power cable into an AC outlet that has a protective conductor also called as earth or ground.

2.4 Installing the Wash Bottle and waste bottle

This dispense pump must be located inside the Wash Bottle and the dispense tube and dispense pump power cable must be connected

To install the Wash Bottle:

1. Plug the pump connector into the soft tube emphatically. As indicated in the following photo.

Figure 2.1 installs the pump 2.

Fill the Wash Bottle with the wash solution.

3. Place the dispense pump inside of the Wash Bottle and secure the cap, as indicated in figure 2.2.

Figure 2.2 Place the pump into the wash bottle

4. Connect the end of the wash tube to the Wash Bottle Tube connector at the rear of the instrument (Figure 1.2).
5. Connect the dispense pump power cable to the dispense pump power connector at the rear of the instrument (Figure 1.2).

6. Connect the two tubes on the waste bottle cap to the waste bottle tube connector at the rear of the instrument (Figure 1.2)
7. Connect the sensor connector on the waste bottle cap to the waste bottle level sensor connector at the rear of the instrument (Figure1.2)

NOTE!

Because the instrument is working with air pressure, the mouth of the waste bottle and all the tubes must be airproofed.

2.5 Installing the wash-head

1. Connect the dispense tube (white connector) and aspirate tube (transparent connector) with the relative connectors of the wash-head and instrument
2. Place the wash-head in the bracket, ensure the two steel locating pins are in the two grooves
3. Adjust the plastic screw to parallel wash-head with work area

ATTENTION! Cautions

Pin tips are sharp and may cause body injury. Be careful when you are installing the wash-head.

2.6 Turn on the System

Fill the wash bottle with wash liquid.

Connect the 2600C to the laboratory electrical supply outlet Press
the instrument power switch (at the rear)
After a series of self-test, the software version interface will display.

Chapter 3 Settings and Adjustment of Instrument

3.1 System Setting

The 2600C washer provides the user with system setting menu for settings of the system. These settings are necessary for the normal use of the washer.

ATTENTION! Cautions

If the system setting is not correct, it will cause serious aftereffect such as wrong dispense volume, liquid overflow, damage to the wash-head and so on. Please be careful.

To enter the system-setting menu, just double click the "cancel" key at the waiting window of the washer. Its menu is as following:

Adjusting Contrast

Changing wash-head

Changing Plate

Adjusting wash-head

Adjusting Top-Aspr

Adjusting Pump

Figure 3.1 System setting menu

Press SELECT to select the sub-menu, press START to enter.

3.3.1 Adjust the contrast

At the system-setting menu, select "Adjusting Contrast" and press, "start".

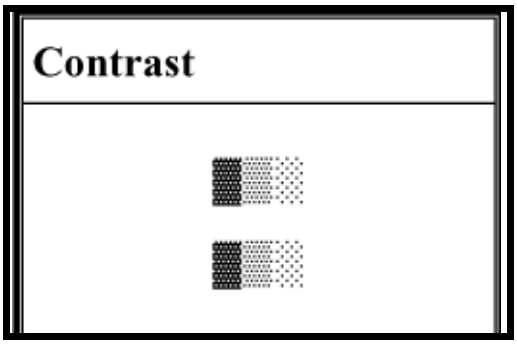

Figure 3.2 Adjusting contrast

Press + to increase and press - to – decrease contrast. After adjusted to the best value.
Press START to save and exit. The value will be saved in the flashrom of the washer, the contrast of LCD will be set as new value the next time you turn on the washer. If you press CANCEL after adjustment, the value will not be saved.
There are 64 rank of the washer LCD's contrast.
When the contrast deviate too much from the best value, maybe you can not see the menu clearly .At this situation, just following the steps below to operate without seeing:

(1) Turn on the instrument.

(2) Wait for the washer to complete its initialization.

(3) double click CANCEL twice quickly.

(4) Press START

(5) Press + - to adjust the contrast, until you can see the display clearly.

(6) Press START to complete settings.

3.3.2 Specify the Wash-head

1) Turn off the washer.
2) Take out the wash-head from the bracket, disconnect the tubes and place the wash-head in the package box for it.
3) Take out another wash-head from its package, connect the tubes and place it well in the bracket. Make sure that the wash-head is parallel with the bracket.
4) Turn on the instrument, waiting for the prime procedure end, and make sure that there is no leakage with the tubes and connectors.
5) Select "Changing Wash-Head", It allows to change the 12 pin or 8 pin plate,"+"/"-" change plate type, Click "START" to save and "Cancel " to ignore change.

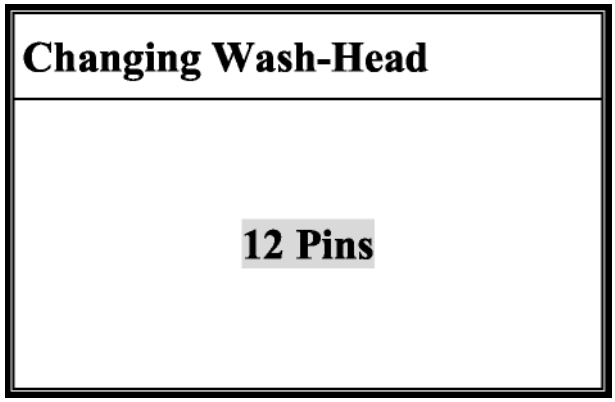

Figure 3.3 changing wash-head

ATTENTION! Cautions

Step 5 is required, or it will cause wrong dispense volume. The wash liquid will spray on the work area. It will even cause damage to the wash-head.

3.3.3 Specify the microplate

The 2600C washer supports flat-, u-, and v- bottom microplates. As most users will use one kind of microplate for a long time, we set the selection of microplate as one item of the system settings instead of a parameter of user define program. If you want to wash microplate different from the already set kind, you should change the system setting of the washer. The default set of microplate is "flat-".

ATTENTION! Cautions

If the microplate used for washing is not the same as the set in the system settings, there will be a risk of damage to the wash-head.

Changing the setting of the microplate will not affect the running of the original user defined program. The software will judge automatically. For example, you set u- or v- bottom in the system settings, but in the program you set double-aspirate. The washer will only do single-aspirate.

Please follow the below steps to change the microplate settings.

At the waiting screen, double click CANCEL to enter the system setting menu.

Click SELECT to choose "specify microplate" and click START to enter the submenu.

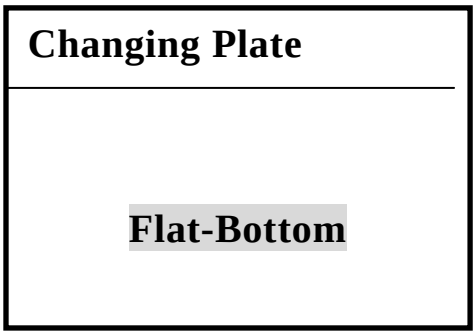

Figure 3.4 changing plate

Click + 、 − to select kind of microplates

Click START to save, the change will be saved into the flashrom of the washer automatically.

3.3.4 specify the position of the wash-head.

As the shape and size of the microplates on market is various from different supplier, The 2600C washer provides the user with the function of adjusting the position of the wash-head. You can adjust the position of the wash-head on vertical and horizontal direction within the range of ±1mm. Please follow the below steps:

1) Place the microplate at the work area.
2) At the waiting screen, double click CANCEL to enter the system setting menu.
3) Click SELECT to choose "Adjusting wash-head " and click START to enter the submenu. The wash-head will move to the first row and the pins will get down to the bottom of the microwell automatically. The system will display the following screen:
4) Click SELECT to switch horizontal and vertical, click + 、 − to adjusting the position of wash-head. Please watch carefully the position of the wash-head while adjusting its position.

At the horizontal direction, the aspirate pin (long and thick one) should be at the center of the microwell. At the vertical direction the aspirate pin should be at the bottom of the microwell and there should be a gap of 0.5~1mm between the scabbard of the wash-head and the groove of the bracket, as shown in Figure 3.5.

Figure 3.5 Adjusting the wash-head

5) After adjustment Click START, the change will be saved into the flashrom of the washer automatically. And the wash-head will back to the waiting position.

6) Click CANCEL to exit during adjusting, the wash-head will back to the waiting position.

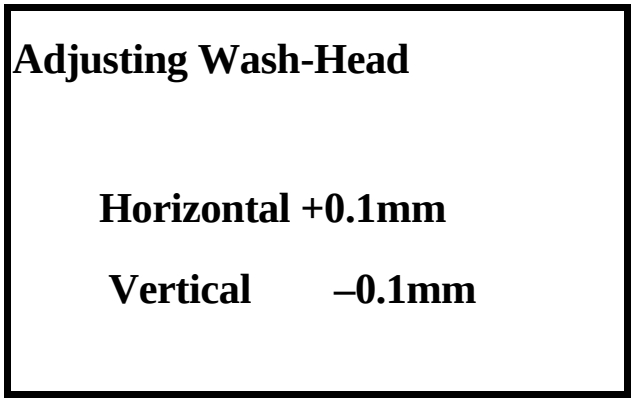

Figure 3.6 Adjusting wash-head

3.3.5 Specify the speed of diving pump

click ⊞、⊟ to change the value, its various range is ~10~+10. This is to micro-adjust the voltage of the diving pump so as to adjust the inject speed of the wash liquid. The recommend value is 0.

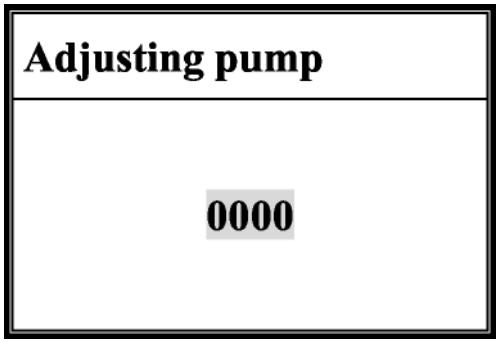

Figure 3.7 Adjusting pump

3.3.6 specify the Top-Aspiration position.

When the dispense volume is more than 350~L, the system will do Top-Aspiration automatically to prevent overflow. The Top-Aspr setting allows change to Top-Aspiration position, you can adjust the Top-Aspiration height during +2mm ~ -2mm., Click "START" to save and "Cancel " to ignore change.

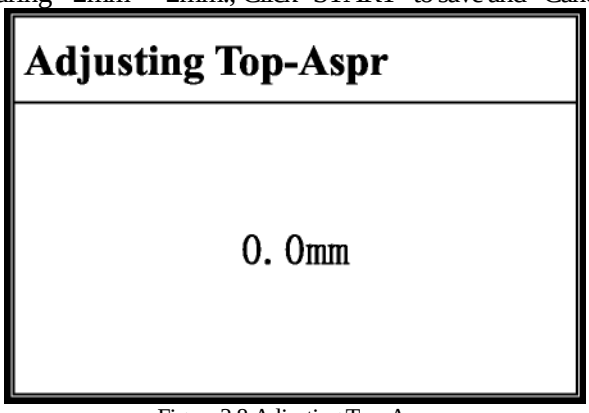

Figure 3.8 Adjusting Top-Aspr

Please watch the position of the wash-head while you are adjusting the Top-Aspiration position. Make sure that the wash-head has been adjusted to suitable position, as shown in Figure 3.9.

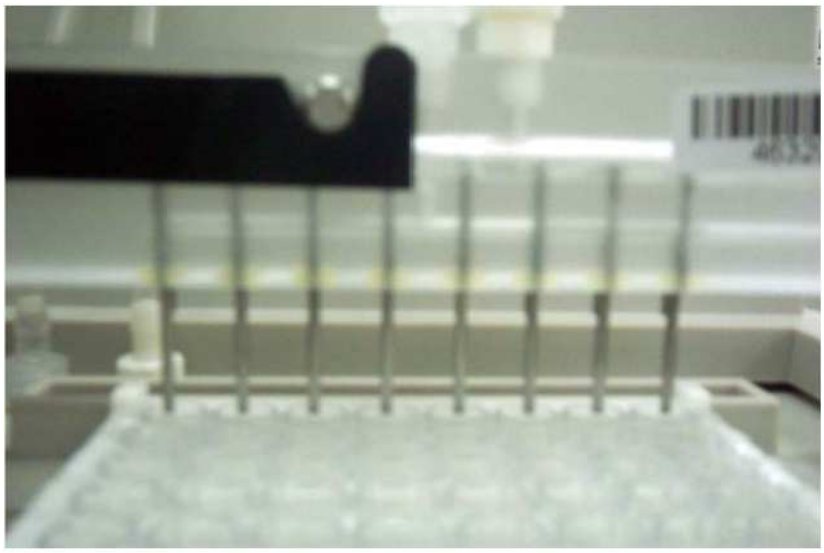

Figure 3.9 Adjusting Top-Aspr

NOTE!

The Quality of washing often affects the validity of test results. To assure adequate washing, perform periodic dispense volume repeatability checks as described in this manual, rinse the pins after use, handle and store the pins carefully to prevent damage, use the prime cycle before each wash, watch the instrument to see that each dispense pins is functioning properly.

ATTENTION! Cautions

Do not operate the instrument if the pressure is unstable or if any pin is damaged.

3.2 Power Off

On the main screen, turn off the instrument directly.

ATTENTION! Cautions

You must wait for at least 30 seconds if you want to turn on the instrument again.

Chapter 4 Operation of Instrument

4.1 Work area and microplate

The work area of the washer is shown in the following figure.

The rear end of the work area is the waiting groove. When the washer is at the waiting state, the wash-head is in the groove. The front end of the work area is the objective table.

ATTENTION! Cautions

- ***Only when the instrument is at the waiting state, you can place microplate on or take it out of the objective table. Otherwise it will cause damage to the instrument or you will be hurted.***
- ***Please wear gloves while you are operating the washer and don't touch the patients' samples directly. If your wound touched patient's sample by accident, please wash immediately and go to doctor for help.***

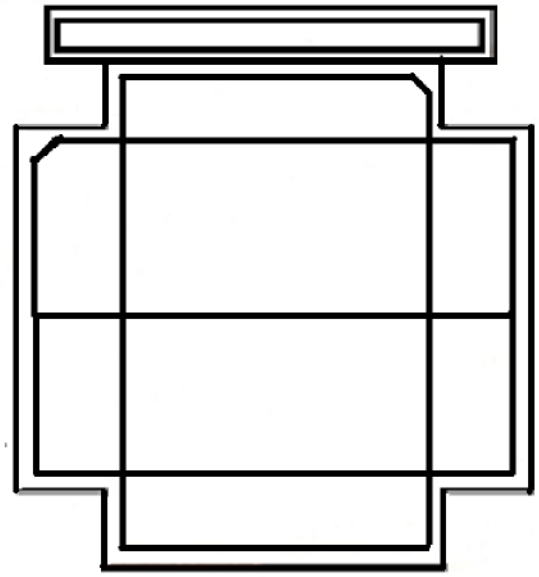

Figure4.1Work area

The 2600C washer can wash 12×8~12×4~8×6 microplates. But different wash-head will have some limit on the kind of microplate. The relation is as follows:

Wash-head / microplate	8pin	12pin
12×8	Support	Support
12×4	Not support	Support
8×6	Support	Not support

Please pay attention to the direction of microplate when you are placing it to the objective table. If

you are using 8pin wash-head, you should make the eight microwell edge of the microplate parallel with the wash-head. Similarly, if you are using 12pin wash-head, you should make the 12 microwell edge of the microplate parallel with the wash-head.

When you are placing the microplate to the objective table, hold the two edge of the microplate, put it into the crossed groove from above to below. Make sure that the back edge contact tightly with the bake edge of the groove.

ATTENTION! Cautions

The instruction for placing microplate must be followed. Otherwise it will cause bad aftereffect such as wrong dispense volume, Liquid overflow, damage to wash-head and so on.

4.2 Wash procedure

In order to bring convenience to different wash procedure, 2600C washer provides you with the user define program. There are total 50 programs numbered from 0-50 and they are stored in the flashrom of the washer. The user define program is consist of the follow parameters.

Wash mode: Select from "plate" and "strip". "Plate" mode is to dispense and aspirate by whole plate. "Strip" mode is to finish the whole procedure including dispense, soak, and aspirate by each row.

Aspirate mode: Select from "single" and "double". "Single" is that the pins only stay at the center of the microwell one time and aspirate. "Double" is that the pins stay at both the two edges of the microwell and aspirate.

Dispense volume: The dispense volume for each microwell. If you choose 8pin wash-head, the select range is 50~L~3mL.If you choose 12pin wash-head, the select range is 50~L~2mL.The adjusting resolution is 50~L. When the dispense volume is more than 350~L, the software of the washer will judge automatically and do the top-aspiration while dispensing.

Soak time: The time between dispensing and aspirating wash liquid. At the "row" mode, the time is 1s-60s and at the "plate" mode, the time is 1 seconds to 8 hours.

At the waiting screen, click "start" to enter program menu.

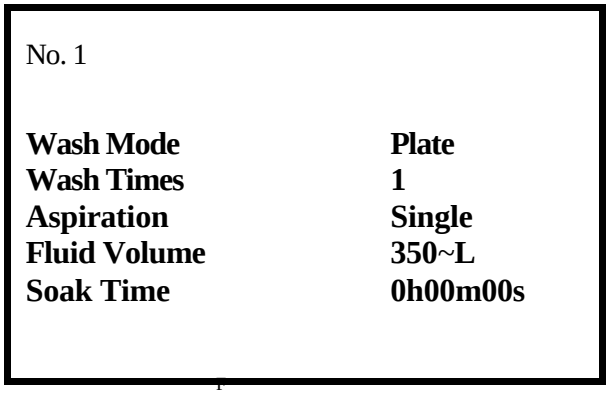

Figure4.2 Program

Click SELECT to select each parameter,. Press + , − to change its value. After set all the parameters, click SELECT to the next step.

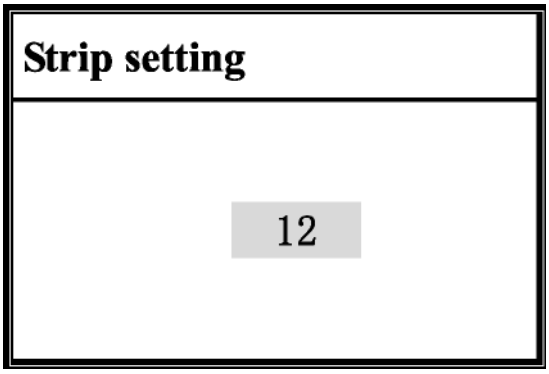

Figure4.3 Strip setting

Click CANCEL to back to the waiting screen, click START to start washing.

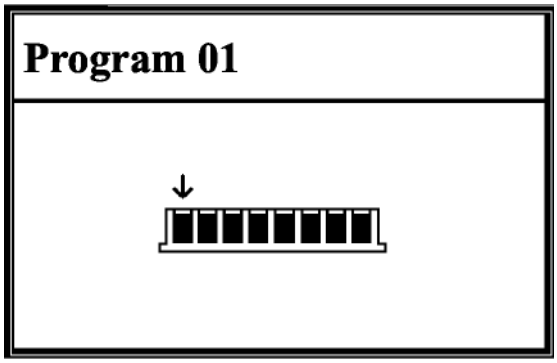

Figure4.4 Running of program

Click CANCEL to stop during washing procedure. Click again the wash-head will back to the waiting groove, after that the system will back to the waiting screen.

When the waste bottle is full, the system will give out a warning and the screen displays like this:

Figure4.5 Waste bottle full

4.3 Prime

Prime means to fill the pipeline of the washer with wash liquid to make its concentration meet the requirement. Prime is required in the following situation:

1) Newly installed instrument.
2) Restart to use leave unused instrument.
3) After rinsing procedure.
4) After changing, supplying washing liquid.
5) After changing wash-head.
6) Finding air bubbles in the pipeline.

If can not clean the air bubbles after prime for one time, Please repeat several times to make sure that all the air bubbles are cleaned. Besides the above prime procedure started by user, the washer

will prime for one time automatically each time you turned it on. Click prime when at the waiting screen, the screen displays like this:

Figure 4.6 Priming

After prime, the system will back to waiting screen automatically.

4.4 Rinsing

Click RINSE key, the screen displays "Put the pump in the distilled water, press any key to continue…" Click any key to start the rinsing procedure, the screen displays "Rinsing…"

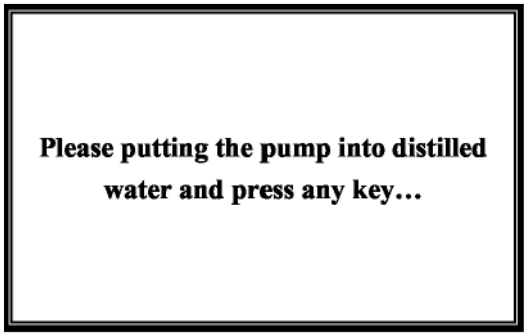

Figure 4.7 Rinsing

4.5 dispense (disp)

At waiting screen, click DISP to start dispense settings. The menu is as following:

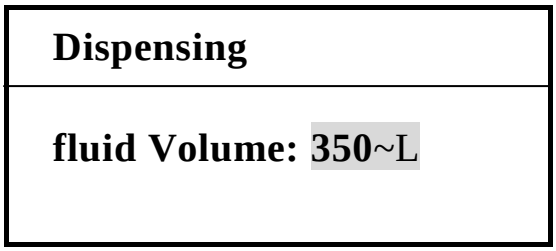

Figure4.8 Dispensing

Click + , − to change the value, and click CANCEL to back to the waiting screen.
The adjustable range of the dispense volume is from 50~L to 2ml.The distance for adjustment is 50~L.
After set the dispense volume, click START to the next step.

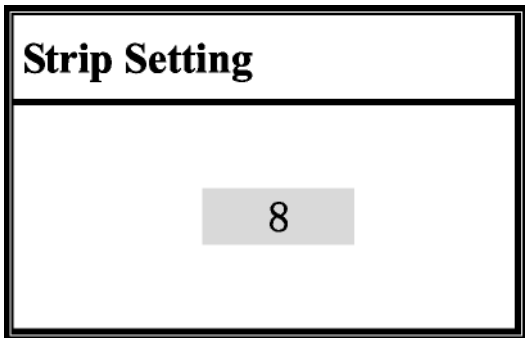

Figure4.9 Strip setting

The number in the center means how many rows from the first row will be washed. When using 12pin wash-head, the maximum number is 8, and when using 8pin wash-head the maximum number is 12. Click [+]、[−]t to change the value, and click START to start dispensing.

The washer system also provides you with the function of setting by each row. Click [+]、[−]t to select "By each row", and click START to enter the setting menu.

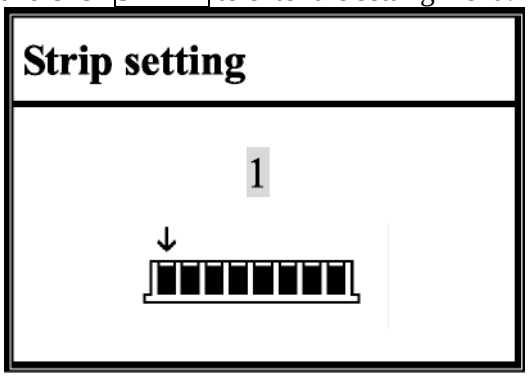

Figure4.10 Dispense by strip

The sketch map of the microplate is displaying in the middle of the screen. The black in the well means liquid. Black means this row will be dispensed, or it will not. The arrowhead on microplate shows that the row is being set now. Click [+]、[−]t to switch each row and click SELECT to set dispense or not. After setting click start to START dispensing. When it ends the system will back to waiting screen.

During dispensing, click CANCEL to stop the procedure, the system will stop all the movement of parts and displays following screen:

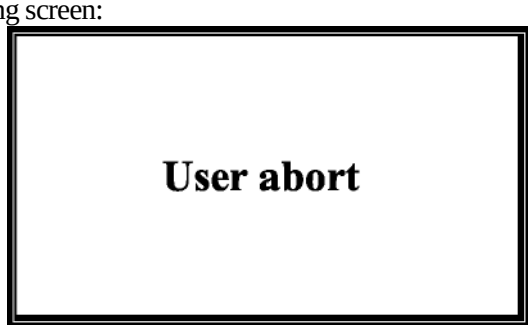

Figure4.11 User abort

Click any key to back to waiting screen.

4.6 Aspirate (Aspr)

Click ASPR to start setting, the screen displays:

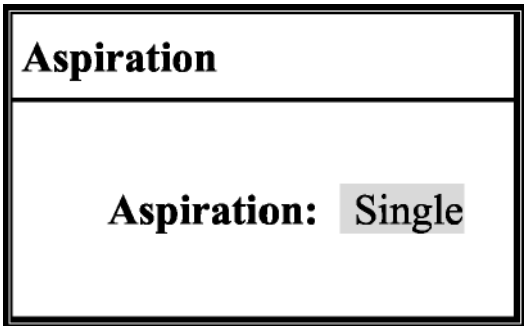

Figure4.12 Aspiration Setting

Click [+]、[−] to change parameters, press CANCEL to exit and back to waiting screen, click START to next step.

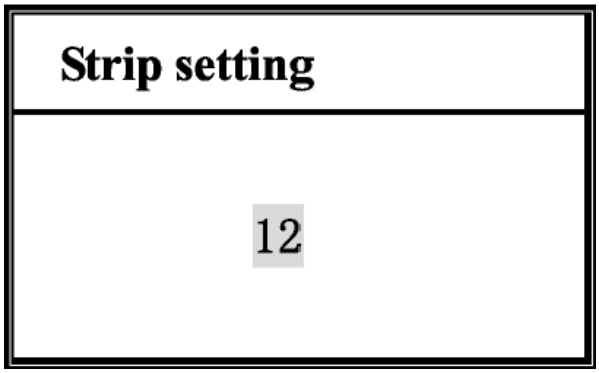

Figure 4.13 Strip setting

Click CANCEL exit and back to waiting screen, click START to start dispensing.

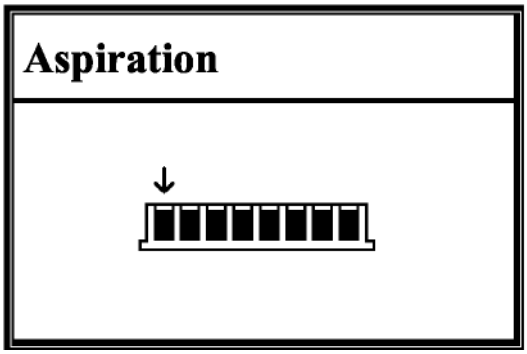

Figure 4.14 Running Aspiration

After the aspiration procedure the system will back to waiting screen automatically. During aspirating you can click CANCEL to stop the procedure, the system will stop all the movement of parts and displays following screen:

Figure 4.15 User abort

Click any key to back to waiting menu.

Chapter 5 Daily Maintenance

5.1 maintenance of work area

1. Wipe off the remnant liquid on the work area each time.
2. Use tweezers to nip a small piece of absorbent cotton to wipe the work area
3. Please pay attention that the head of the tweezers don't scratch the surface of the worktable

ATTENTION! Cautions

- ***Don't use any organic solvent, oil and fat, caustic liquid to clean the work area.***
- ***Be careful to prevent the tweezers lacerating the surface of work area.***
- ***Please wear gloves while doing the maintenance and wash your hands each time after work.***

5.2 maintenance of wash-head

The wash-head is one of the core parts of the washer, its state will affect the veracity of the dispense volume and the liquid remain volume. So it is very important of the maintenance of wash-head.

The suspended matter in the wash liquid will jam the pipeline. Please use fresh wash liquid and usually check if there is suspended mater. Remember to run "rinse" procedure after working with the instrument.

When you find the dispense volume of one row is obviously less than other rows, it means that the corresponding dispense pin (thin and short) is jammed. When you find the liquid remain volume of one row is obviously more than other rows, it means that the corresponding aspirate pin is jammed. Doing the maintenance of the wash-head following the below steps:

1. Twist off the two plastic tubes and the two screws in side of wash-head
2. Use two needles to clean the pins of the wash-head
3. Take up the wash-head with the screw-removed end downward, knock it against the paper towel or gauze so as to remove the blockage in wash-head
4. Dispense the wash-head into water, plug a large-side syringe into the plastics hole on the wash-head and push the syringe back and forth. Both of the two plastics hole should be done as such
5. Put the black sealing washer round the root of the metal screws and tighten up the screws

ATTENTION! Cautions

Pin tips are sharp and may cause body injury. Be careful when you are doing maintenance of the wash-head.

5.3 Disposal of waste bottle

The sensor in the waste bottle can detect the level of the waste liquid. When it reaches a certain level, the bottle will give out warning and system will not receive any operation that includes aspiration. At this situation, please disposal the waste liquid, you can do this without turning off the washer. Please follow the below steps:

1. Hold the cap of waste bottle and lift whole bottle slightly
2. Hold the bottle with another hand and turn it clockwise until the cap dispatch from the bottle
3. Pour away the waste liquor and put bottle back to its former place
4. Hold the cap and put it on the mouth of waste bottle
5. Hold the bottle with another hand and turn counter clockwise until it is tightly screwed

5.4 maintenance of tube

1. Fill the wash bottle with distilled water and wash blank plate once a week so as to clean up the whole tube path and dispense pump
2. The liquid (water) in the wash bottle should cover the dispense pump

NOTE!

- ***Please pay attention to the power you screw down the cap of the waste bottle. If the cap is too loose, can't ensure the tightness of waste bottle and affect the effect of aspiration. If the cap is too tight, it may be damaged.***
- ***2600C washer is an exact instrument; please pay attention to its daily maintenance.***
- ***The wash-head of the instrument is very exact, please pay attention to adding sample and not to add whole blood or other eyewinker, otherwise the wash-head may be jammed.***

Chapter 6 Replacement of Spare Parts

6.1 Replacement of wash-head

1. Take the wash-head off~disconnect the two tubes from the wash-head.

2. Install a new wash-head and connect the tubes, then put the wash-head on bracket. Adjust the wash-head to the suitable location.

ATTENTION! Cautions

Pin tips are sharp and may cause body injury. Be careful when you are installing the wash-head.

6.2 Replacement of power supply

1. Remove the two screws in the bottom, which fix the upper cover and base of the instrument.
2. Open the upper cover~disassemble the frame of the power supply.
3. Disassemble the power supply board and replace it with a new one.

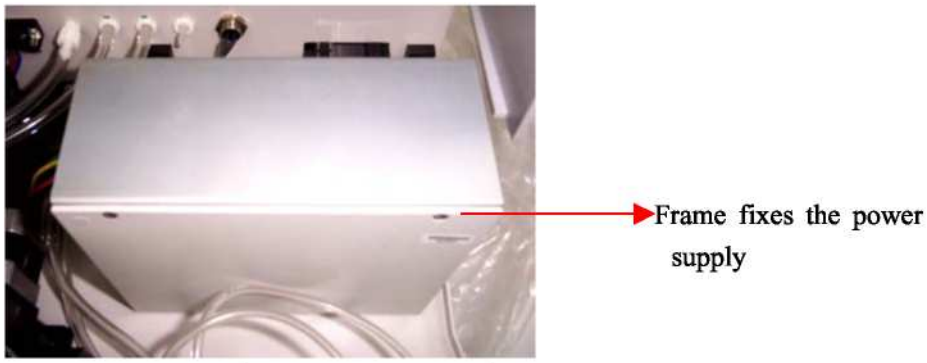

Figure 5.1 Power Supply

6.3 Replacement of Dispense Pump

1. Take out the dispense pump from the wash bottle~pull the connector of tube out.
2. Replace the pump with a new one, and then connect the tube.
3. Put the pump back to the wash bottle.

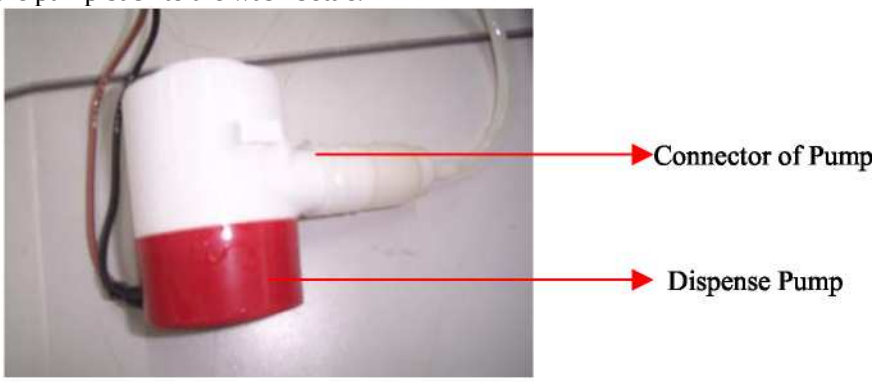

Figure 5.2 Dispense Pump

6.4 Replacement of Solid Valve

1. Power off the instrument, disconnect the power cable and open the upper cover.
2. Snip off the small clip which fix the wires of power supply.
3. Remove the four screws, which fix the solid valve.
4. Use a forceps to take off the two wires 1&2,and then solder them with the two wires of new solid valve.
5. Connect the two tubes to connectors of the solid valve, and then fix with clips.
6. Install the new solid valve the base of the instrument.

1-blue, 2-black
3-black, 4-red

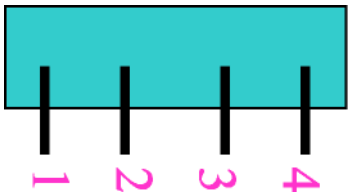

Figure 5.3 the solid valve

Chapter 7 Trouble Shooting

The 2600C washer will stop all the movement of mechanical parts when system error detected .It will give out warning and display the error information on the screen. When you find the errors, Please contact the professional personal of the supplier. Here are the error information and their meanings:

Error Information	Meanings
System Error 03	Error of horizontal movement organ.
System Error 04	Error of vertical movement organ.
System Error 08	Failed to write in Flash ROM.
System Error 09	Error with system ROM.
System Error 10	Error with system RAM.

NOTE!

- ***If you find any problem that you can't solve by yourself, or a problem repeats, please contact the supplier for help.***
- ***Different version of instrument will be different in configuration; these changes will not affect the capability.***

Trouble	Shooting
1~ When switch on the machine, there is no display and the machine does not start up.	Check the electric supply socket and fuse. Check the power supply to the control board for 5v, 12v and 24v input.
2~ Do not suck up the liquor and the vacuum pump does not work	Check the power supply for 24v output.
3~ Do not dispense the liquor.	Check the dispensing head for jam and the electromagnetic valve for malfunctions.
4~Liquor is out of control and dispensed all the time.	Check the electromagnetic valve for malfunctions.
5~The system always gives out warning of waste bottle full.	The waste bottle is full, just screwing out the cap, pours out the waste liquid and screw down the cap again. The sensor cable has not been connected to the connecter at the rear of the washer.

Appendix I Technological Parameters

Wash-head:	8pin or 12pin
Liquid resolution:	10uL
Liquid volume control:	50uL-3mL/8 well mode; 50uL-12mL/12 well mode
Wash mode:	Plate or Row
Aspirate mode:	Single or Double
Precision (CV value):	≤ 2%
Remain volume:	≤ 3uL
Max dispense volume :	2000uL×12 or 3000uL×8
Time to wash a whole plate—Single cycle: —Three cycle:	≤ 105 seconds ≤ 250 seconds
Max soak time—Plate —Row	24h59m59s 24h59m59s
No. of user define program:	50
Volume of bottles:	Both wash and waste bottle is 2000ml
n. couplant of liquid:	Glass, nylon, Teflon, polypropylene, stainless steel Tygon® pipeline
Cubage: (L×W×H mm):	410×343×178
Weight:	9kg
Power supply:	220VAC±10%,50/60Hz
power consumption:	Max 150GA
Using temperature:	10°C~40°C
Store temperature	1°C ~ 40°C

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