

STATLYTE C Series Electrolyte Analyzer (K/Na/Cl/Ca/PH) Service Manual



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Chapter 1 Instrument structure

1.1 Front panel

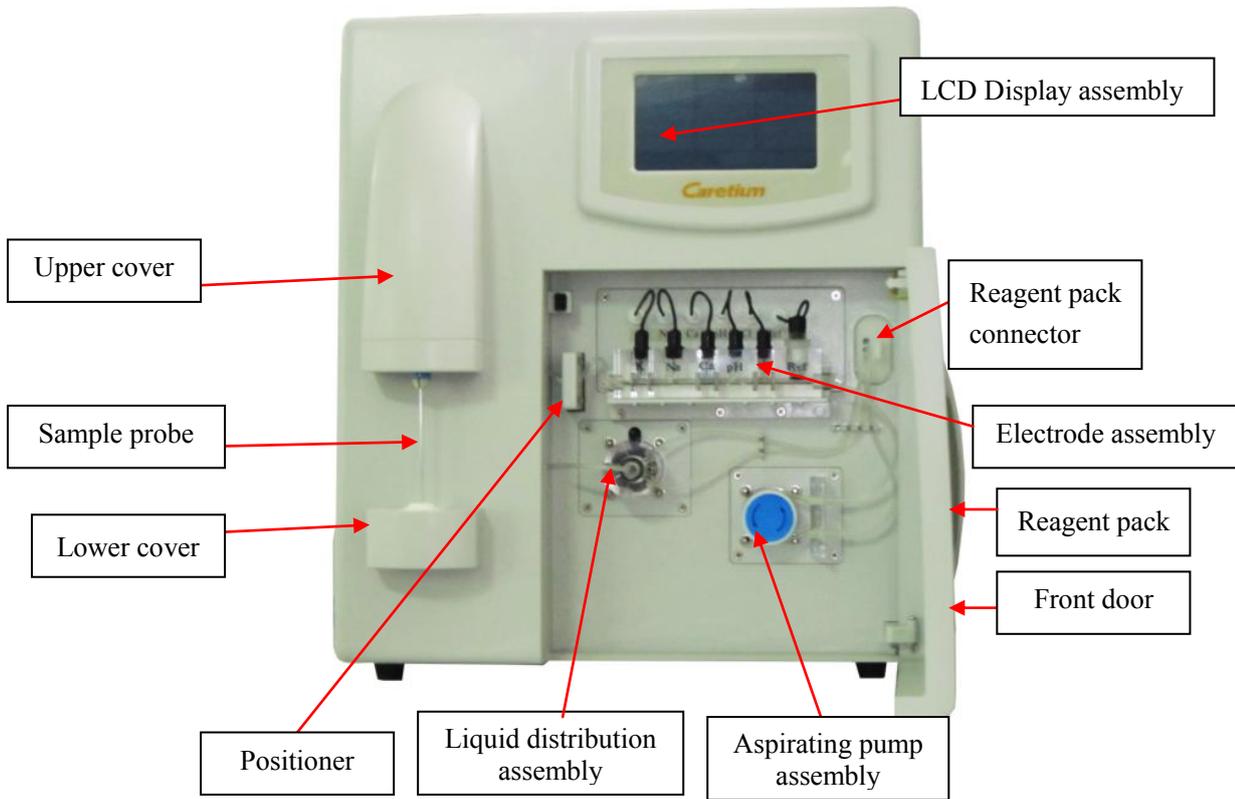


Figure1-1

1.2 Rear panel



Figure 1-2

1.3 Internal structure

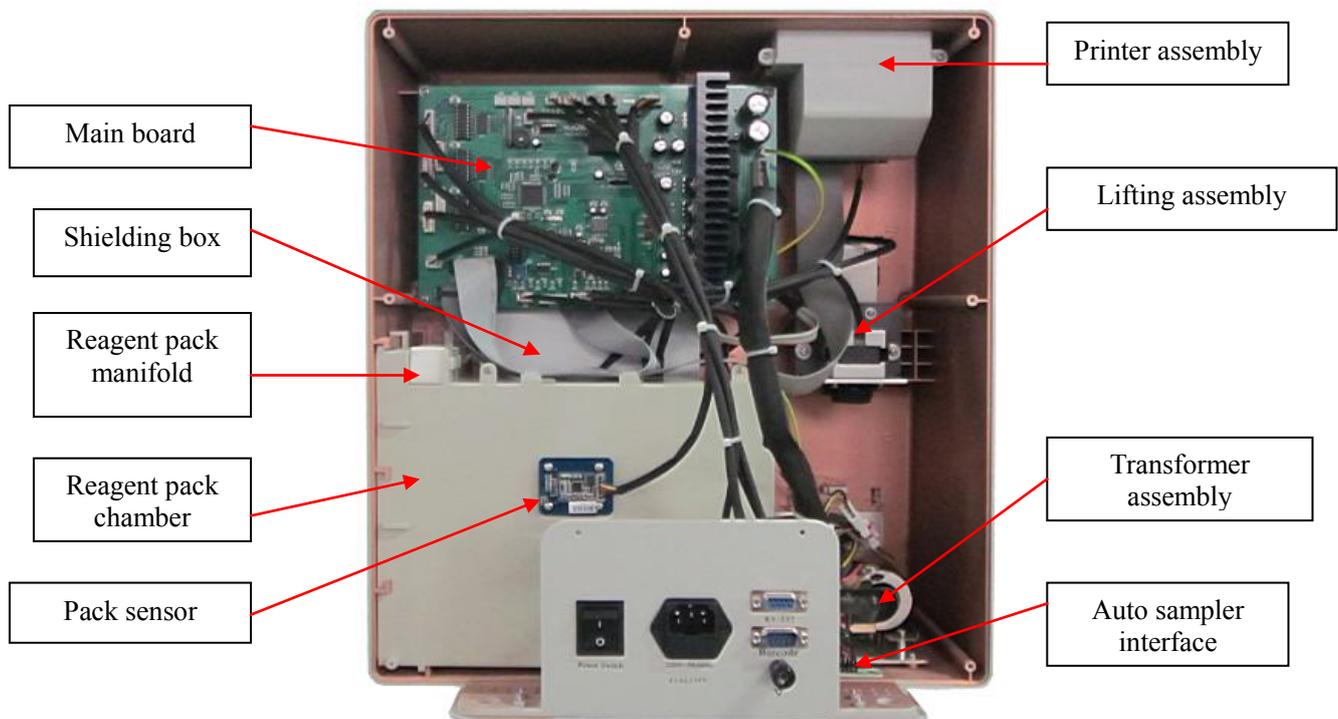


Figure 1-3

Note: LCD display assembly is in the back of main board.

1.4 Mainboard

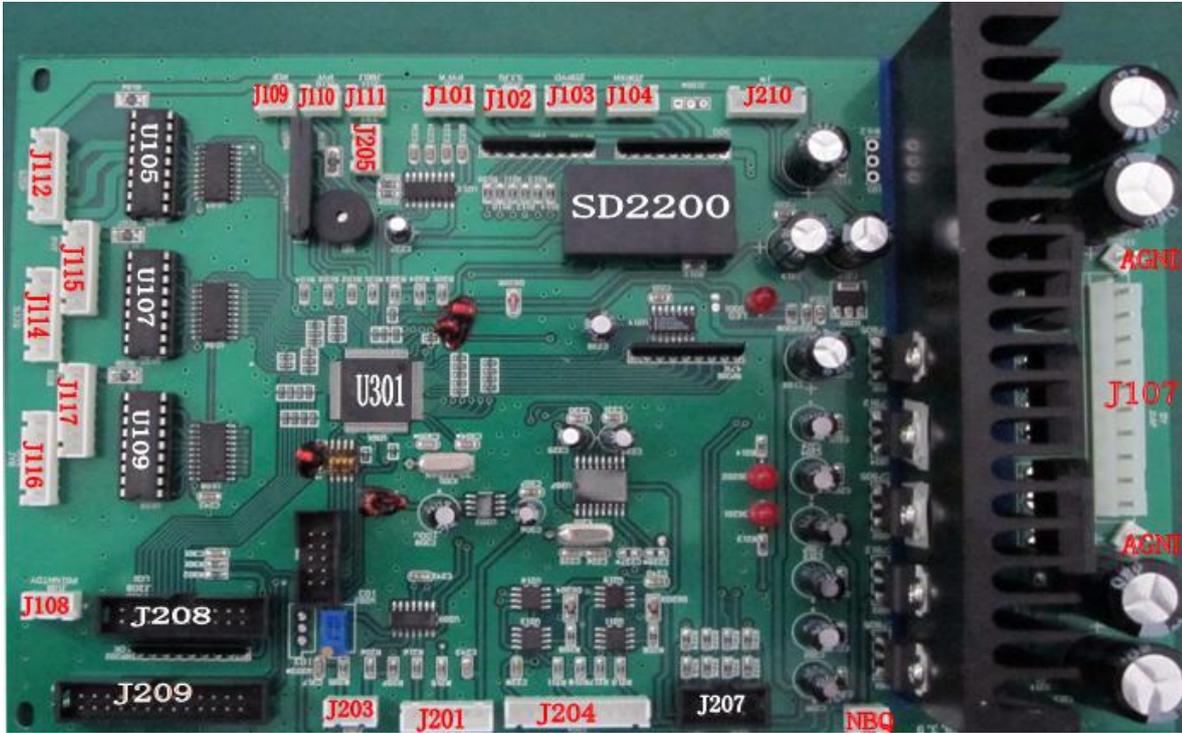


Figure 1-4

Connector	Cable	Connector	Cable
J101	Liquid Distribution Valve Optical Coupler Connector Pin	J201	Pressure Sensor Connector Pin
J102	CAM Switch Connector Pin	J203	Positioner Connector Pin
J103	Auto-sampler Original Point Optical Coupler Connector Pin	J204	Amplifier Board Connector Pin
J104	Auto-sampler Optical Coupler Connector Pin	J205	RS-232 Connector Pin
J107	Transformer Connector Pin	J207	Touch Screen Connector Pin
J108	Printer power Connector Pin	J208	LCD Connector Pin
J109	Exhaust Valve Connector Pin	J209	Printer Data Cable Connector Pin
J110	Drain Valve Connector Pin	J210	Read-Write Mode Connector Pin

J111	Mixer Stepper Motor Connector Pin	U105	ULN2803APG
J112	Auto-sampler Motor Connector Pin	U107	ULN2803APG
J114	Lifting Stepper Motor Connector Pin	U109	ULN2803APG
J115	Liquid Distribution Valve Motor Connector Pin	U301	C8051F0202
J116	Aspiration Pump Motor Connector Pi	NBQ	78T12 Output Voltage Checking Port
J117	Acid Liquid Pump Motor Connector Pin	AGND	Grounding line Connector Pin

1.5 Circuit board of printer

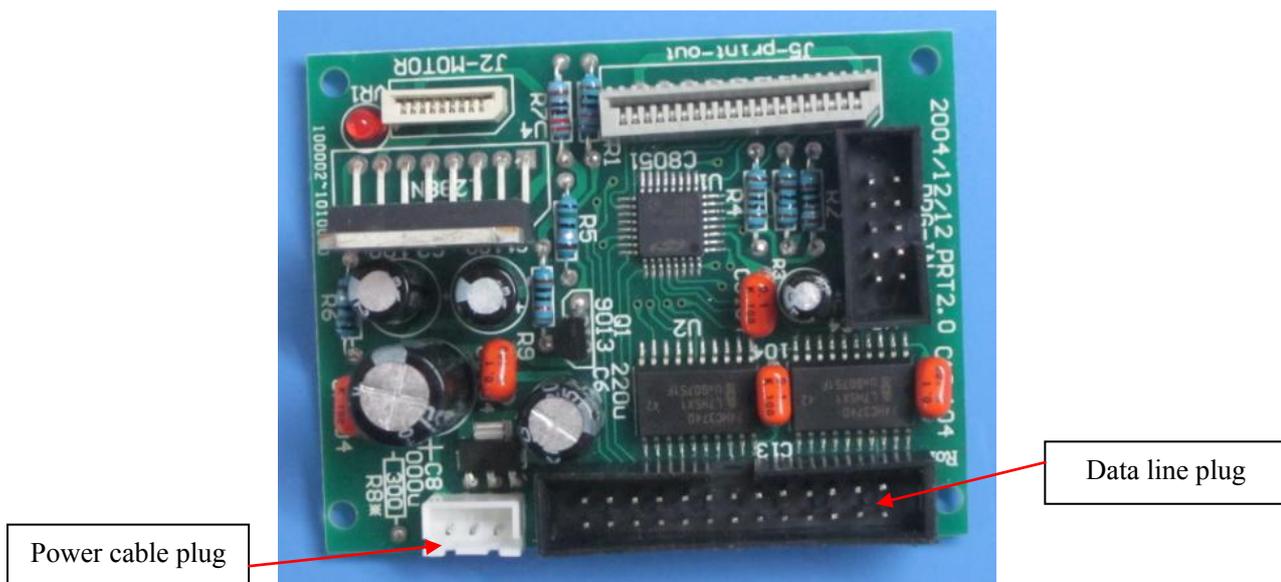


Figure 1-5

Chapter 2 Disassembly of components

Open rear cover: There are 9 screws need to disassembly, see fig. 2-1



Figure 2-1

a) Printer assembly

Pull out the lead wire pin which connect to J209 and J108 plug, loosen 2 screws, see fig. 2-3

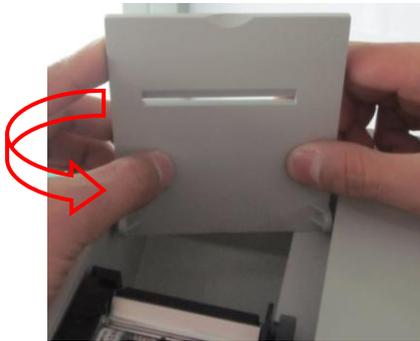


Figure 2-2

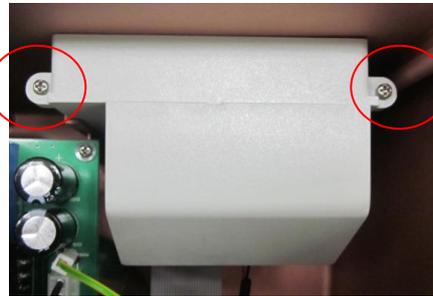


Figure 2-3

Take off the assembly, then open the printer cover, loosen the screw, see fig. 2-4

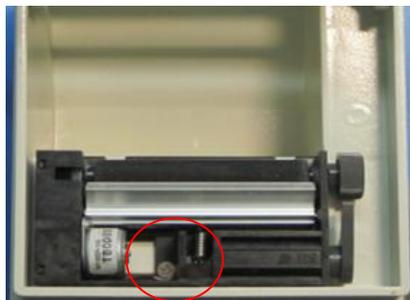


Figure 2-4

Loosen 2 screws, see fig. 2-5

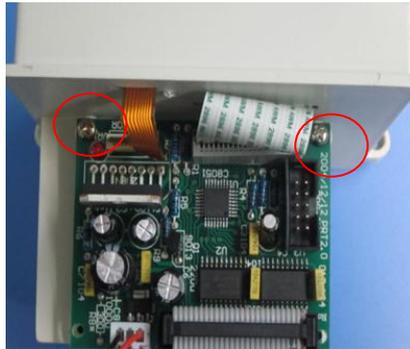


Figure 2-5

Release two data lines from PCB board of printer.

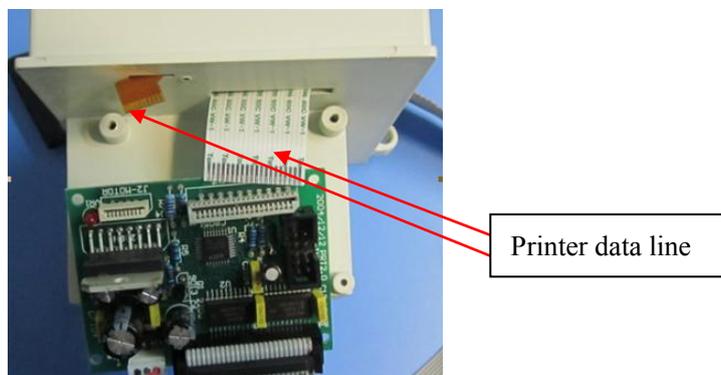


Figure 2-6

Assemble the printer: When the data line connect to circuit board, ensure the reliability of the connection.

b) Mainboard

Firstly, disassemble printer assembly, pull out all the plugs connect to mainboard.

Loosen 4 screws, see fig. 2-7. Then take out the mainboard

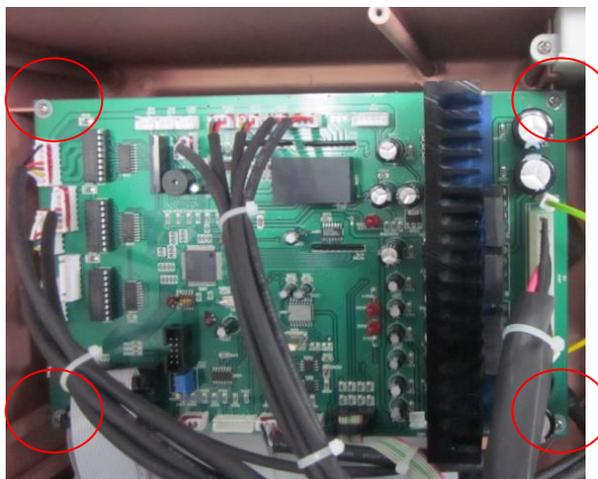


Figure 2-7

c) Elevator assembly

Pull out the plug which connection to J104 and J102 plug, loosen 2 screws, see fig. 2-8. Then replace it.

Assemble the lifting: See fig. 2-8, adjust the position of installation with \leftrightarrow direction by visual. Make sure the sample probe could enter the washing block easily.

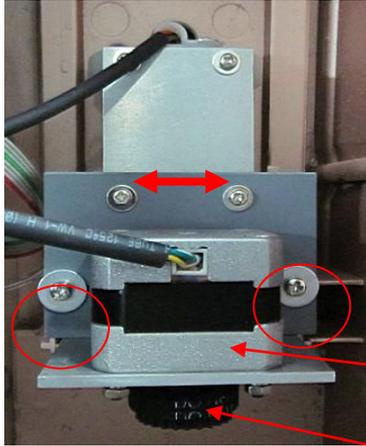


Figure 2-8

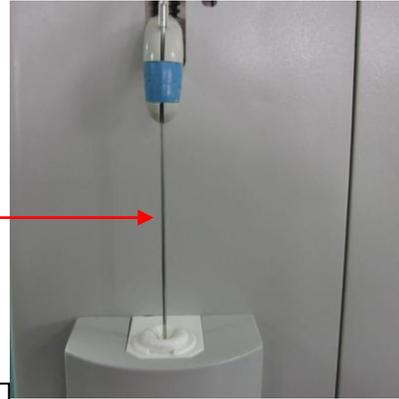
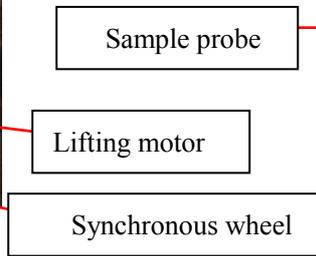


Figure 2-9

Loosen the screws, see fig. 2-11. Then disassemble synchronous wheel of motor;

Loosen the screws, see fig. 2-10. Then disassemble lifting of motor.

Assemble the synchronous wheel: After loading the synchronous wheel to the axis, load the synchronous belt and rotate the wheel, see fig.2-11. Adjust the position of two synchronous wheels. Ensure the two wheels and the belt in one line. Tighten the screws.

Assemble the motor: Load the screw caps. Don't tighten them. See fig.2-10. Adjust the motor with the direction. Then tighten the screw.

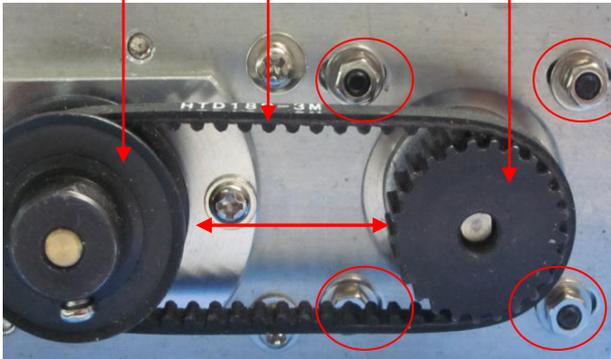
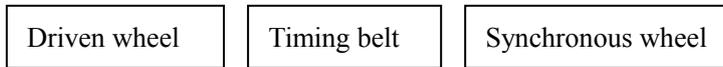


Figure 2-10

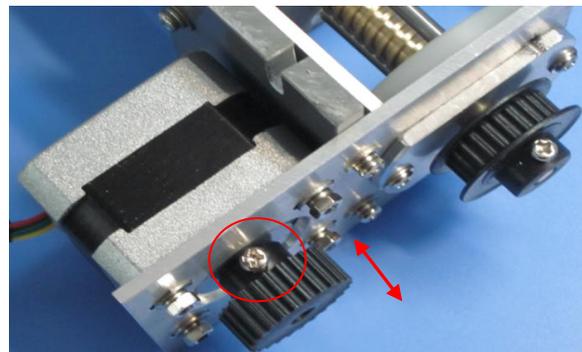


Figure 2-11

Loosen the screws, see fig. 2-12. Then disassemble the base of sample probe.

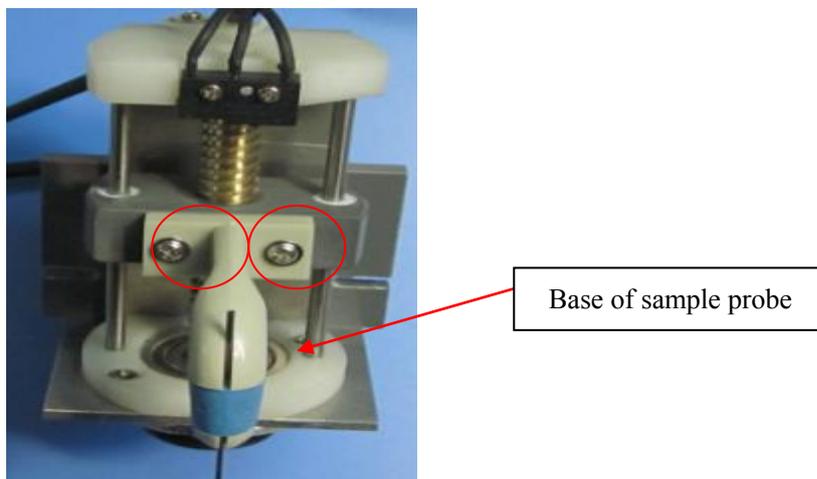


Figure 2-12

Loosen the screws, see fig. 2-13. Then disassemble the limit switch.

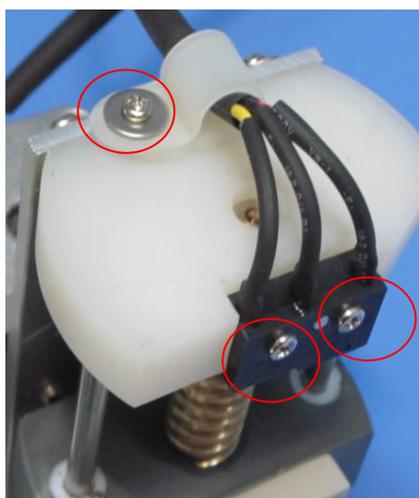


Figure 2-13

d) Transformer assembly

Pull out the pin of lead wire from J107 plug.

Fix screw caps 1,2 with M5.5 wrench. Then disassemble screws, remove the transformer assembly from instrument.

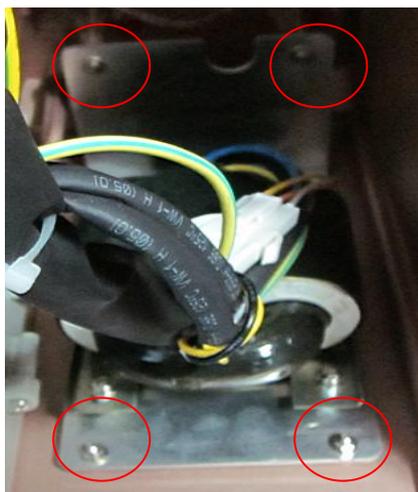


Figure 2-14

See fig.2-15. Loosen the screws. Separate connector of the lines. Disassemble the component 78T12.

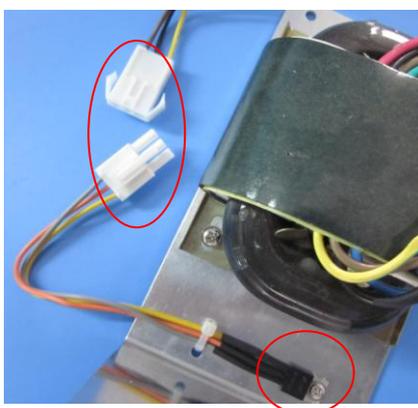


Figure 2-15

Assemble the component 78T12: Reconnect the lines. Check the welding quality inside the connector. Ensure the reliability of the connection.

e) Display assembly

Take off the printer assembly and mainboard, then pull out the pin from J208,J207. See fig.2-15. Loose 4 screws, take off the display assembly and replace it.

Assemble the display: Tighten 4 screws.

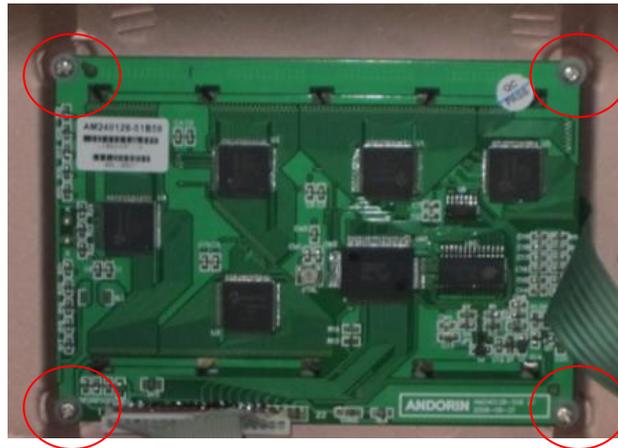


Figure 2-16

f) Liquid distribution assembly

Disassemble the printer assembly.

Pull out the pin from J115, J101. Pull out all the connection tubes (see fig.2-17) and loosen 4 screws in the valve plate. Then take off the assembly and replace it.

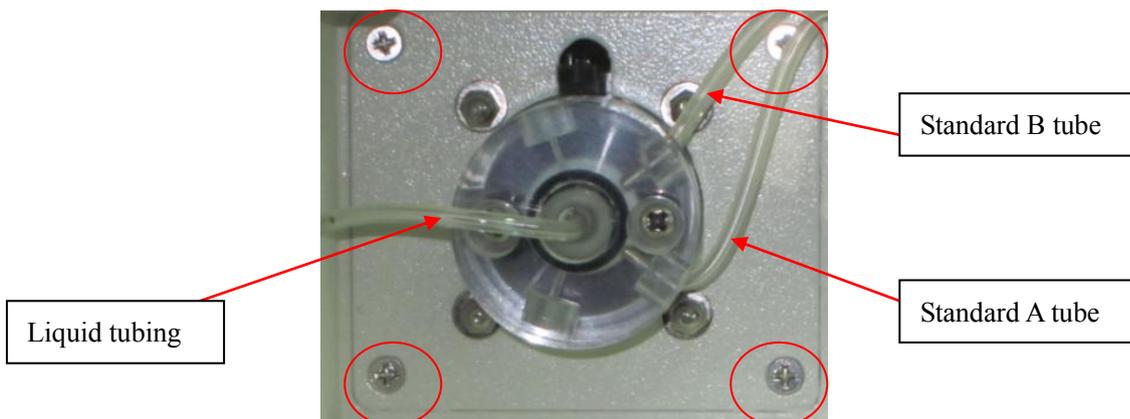


Figure 2-17

g) Sample pump assembly

Pull out the pin from J116. Take off the pump tube. Unscrew 4 screws see fig.2-18. Then take off the assembly and replace it.

Assemble the sample pump: Make sure the position of pump tube is correct. See figure 2-17.

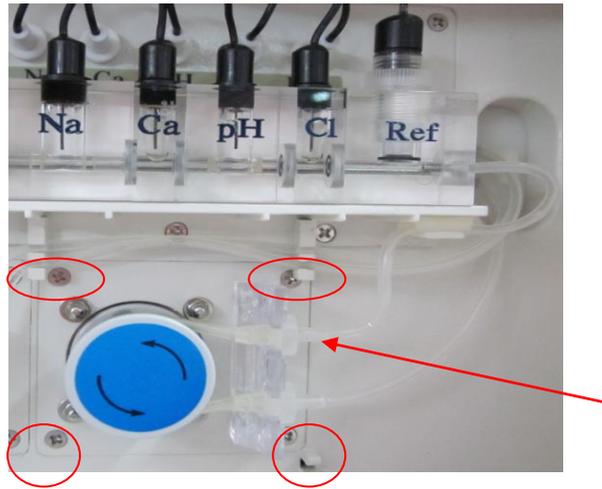


Figure 2-18

h) Amplifier board assembly

Pull out the pin from J204;

Loosen 3 screws (see fig.2-19 blue mark). Take off the electrode fixed base;

Loosen 3 screws (see fig.2-19 red mark). Then take off the assembly and replace it.

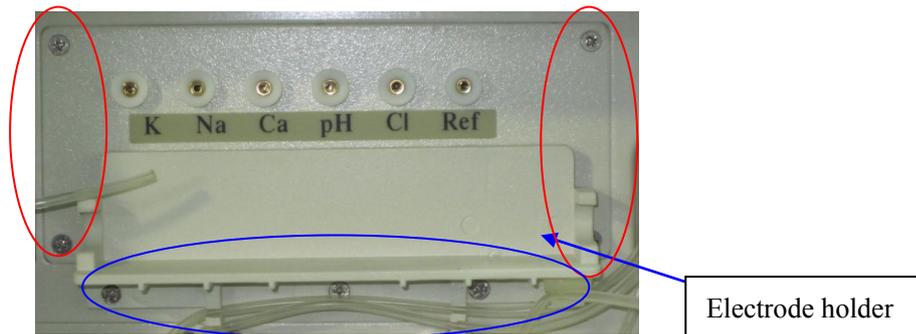


Figure 2-19

i) Electrode assembly

Pull out the internal pin of each electrode and connecting tube. Take off the electrode assembly from electrode holder. Loosen the screw cap. Then take out the electrode and replace it.



Figure 2-20

Assemble the electrode: Don't miss the rubber O-ring; Tighten the screw cap. Ensure that there is no

bubble at the bottom of each electrode.

j) Positioner

See fig. 2-21, pull out the positioner.



Figure 2-21

k) Positioner plug

Pull out the pin from J203 plug. See fig. 2-23. Take out the positioner plug and replace it.

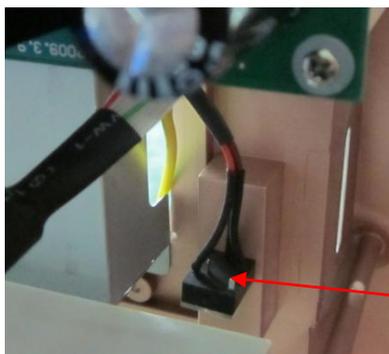


Figure 2-22

Positioner
socket



Figure 2-23

l) Reagent pack manifold

Disassemble the screw, see fig. 2-24 (inside reagent pack chamber),



Figure 2-24

Open the door of instrument, pull out the reagent pack manifold and connecting tube (see fig.2-25).

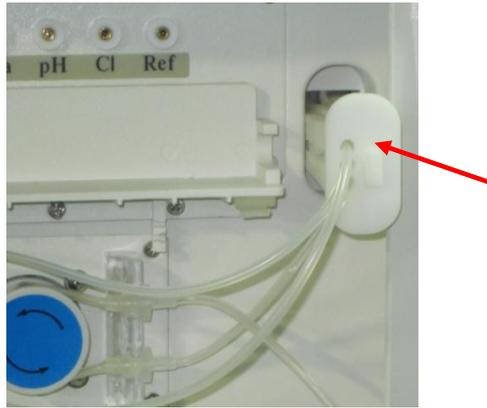


Figure 2-25

Installation: Make sure the tube connected to reagent pack manifold is correctly positioned. See fig.2-26.

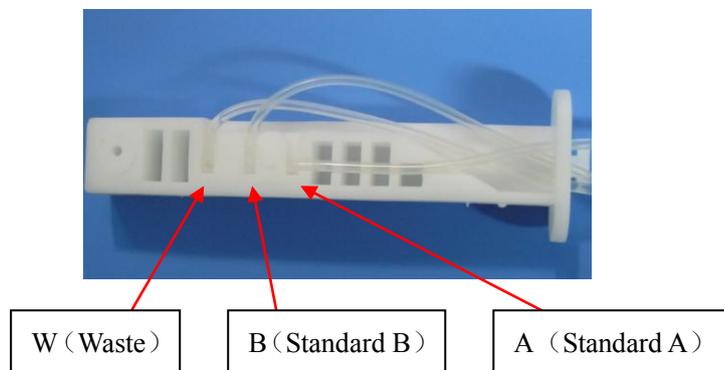


Figure2-26

q) Sample probe

Startup Lifting, pull out the sample tube. Then take off the sample probe. See fig.2-27.



Figure 2-27

r) Washing block

Pull out the tube from washing block (see fig. 2-28). Then separate the washing block. See fig.2-29.



Figure 2-28

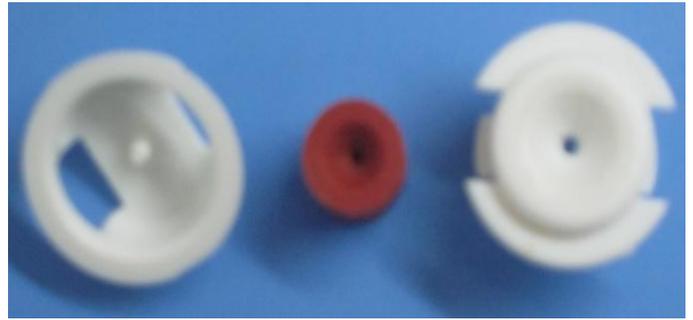


Figure 2-29

s) Pack sensor

Loosen 4 screws. see fig. 2-30. Pull out the pin form J201. Then take off and replace it.

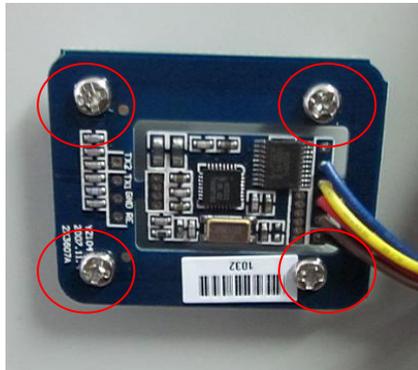


Figure 2-30

t) Replace the fuse

Pull out the fuse with a screwdriver, see fig.2-31. Then replace it.



Figure 2-31

u) Upper cover

See fig.2-32. Take off the upper cover.

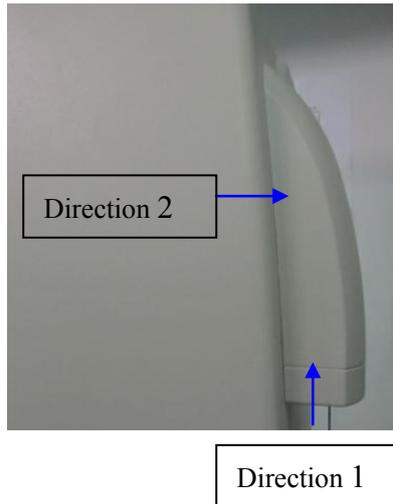


Figure 2-32

v) Lower cover

See fig.2-33. Take off the lower cover.

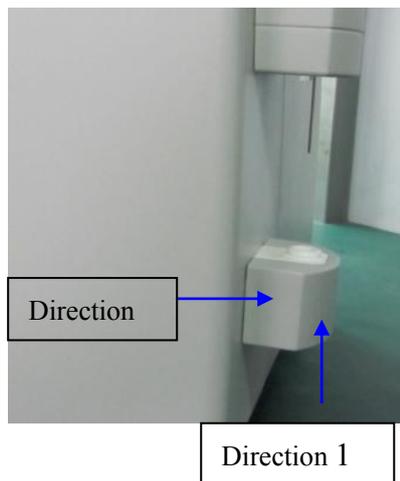


Figure 2-33

Chapter 3 Troubleshooting

3.1 Problem of connection on the mainboard

Cause: The instrument may be affected by vibration, dust or other factors during the transportation. It may cause the connection of components loosened.

Solution: Pull out the power plug. Open the rear cover. Ensure the reliability of all the connections. If necessary, reconnect or replace the components.

3.1.1 When switch on the instrument, Touch screen is good but lifting, sample pump and liquid distribution don't work.

Cause: 12V voltage output failure.

Solution: Check the voltage of NBQ two points with multi-meter, the voltage should be 12V(see fig. 3-1).

Abnormal:

- Check if the lead wire of 78T12 and transformer are reliable, see fig. 3-2.
- Check if the connection between transformer output and J107 is reliable or not(see fig. 3-3). If there is problem, replace 78T12.

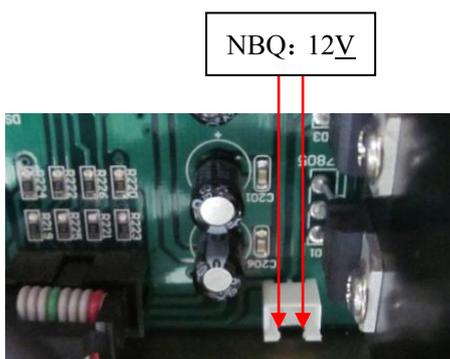


Figure 3-1

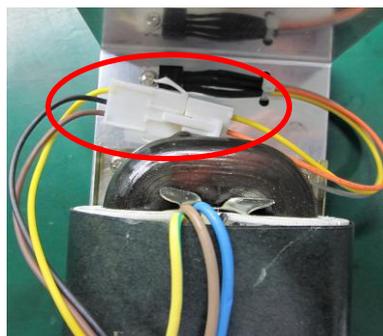


Figure 3-2

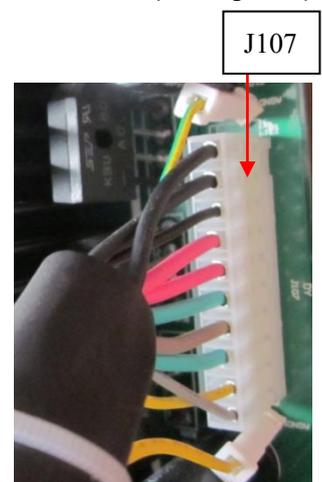


Figure 3-3

3.1.2 Power-on, no back light

- Check if the fuse is defective or not. If yes, replace it.
- Check if the connection with display screen is working or not (see fig. 3-4). If necessary,

reconnect it.

- Check if the connection between the data line of display screen and J208 socket is reliable or not (see fig.3-5) . If necessary, reconnect it.



Figure 3-4

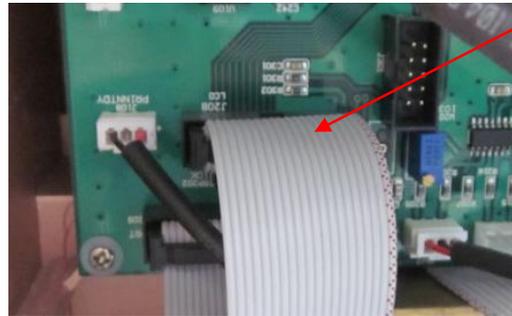


Figure 3-5

3.1.3 Lifting and liquid distribution valve don't work

Check if the connection between J114 and J115 is reliable or not. If necessary, reconnect it.

Check if the connection with U107 (2803 integrated block) is reliable or not. If necessary, reconnect it.

Check if the motor of lifting and liquid distribution valve is broken or not. If broken, replace it.

Check if the integrated block is broken or not. If broken, replace it.

Note: In case of absence of auto-sampler, U105 component can be used to replace a defective and similar one in the mainboard.

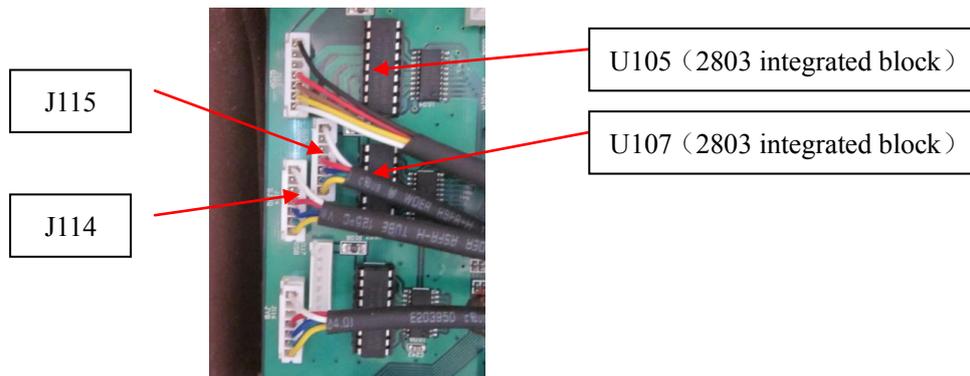


Figure 3-6

3.1.4 The motor of sample pump doesn't work

Check the mainboard U109(2803)、J116. Refer to 3.1.3

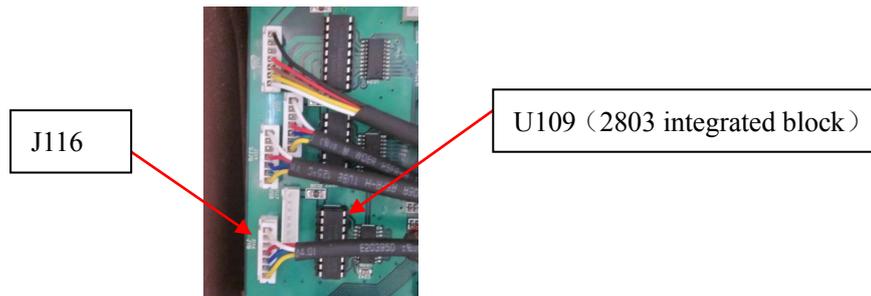


Figure 3-7

3.1.5 STD , measuring result confusion or zero

Check if the connection with J204 is reliable or not. If necessary, reconnect it.

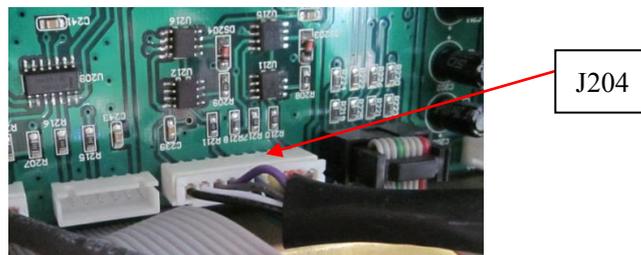


Figure 3-8

3.1.6 Program confusion, the instrument doesn't work properly.

Solution: Clean the dust, moisture with alcohol around the U301 (C8051F020) ,see fig.3-9.

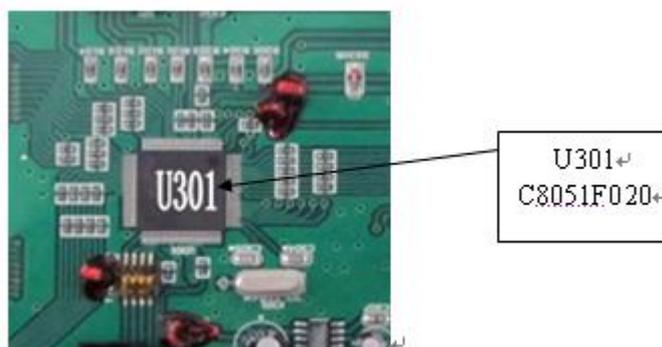


Figure 3-9

3.1.7 Auto sampler is not moving

Check if the connection with auto sampler is reliable. If necessary, reconnect it.

Check if the connection with J115 is reliable. If necessary, reconnect it.

Replace the U109 (2803 integrated block).

Auto sampler tray running is abnormal, check if the connection with J104 and J103 is reliable. If necessary, reconnect it.

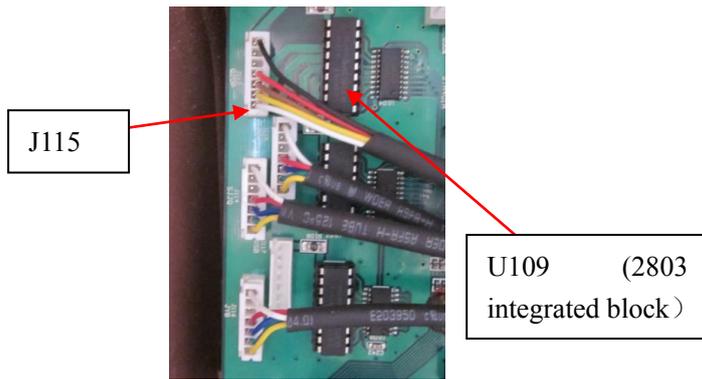


Figure 3-10

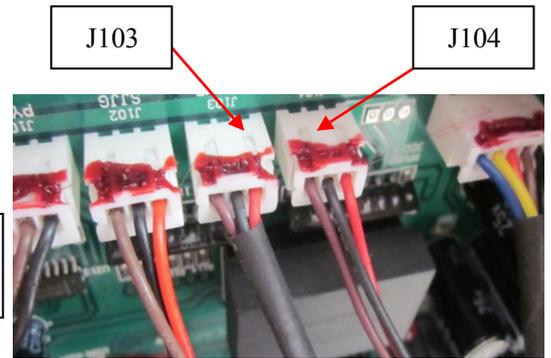


Figure 3-11

3.1.8 No print-out

Check if the connection between J108 and J109 is reliable. If necessary, reconnect it.

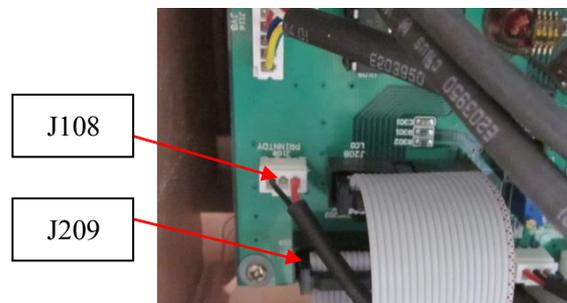


Figure 3-12

Check if the connection with printer circuit board is reliable or not (fig. 3-13 red mark). If necessary, reconnect it.

Check if the connection between printer and printer circuit board is reliable or not (Fig.3-13 blue mark). If necessary, reconnect it.



Figure 3-13

3.1.9 The date of Display or print-out is not correct.

Solution: Reconnect the SD2200EP or replace it.

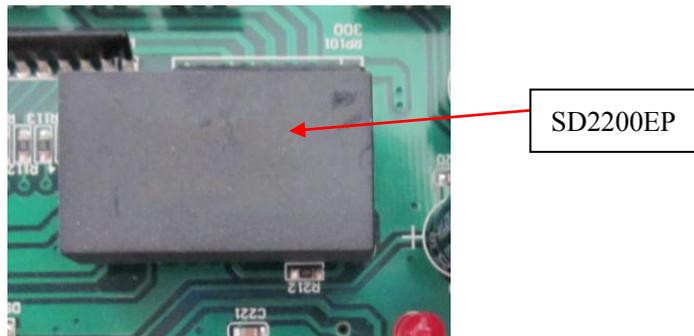


Figure 3-14

3.2 Tubing blockage

Solution: Use 'Valve' function, check the liquid tubing step by step.

3.2.1 Use Valve function

In the main menu select **Service**. Then select **Time** key. The screen displays, see figure 3-15,



Figure 3-15

Then input "983", select **Exit** key. The screen displays as figure 3-16, press Valve, the button turns white. Liquid distribution valve and sample pump rotate. After few seconds, they stop running. If press Valve again, they rotate again.

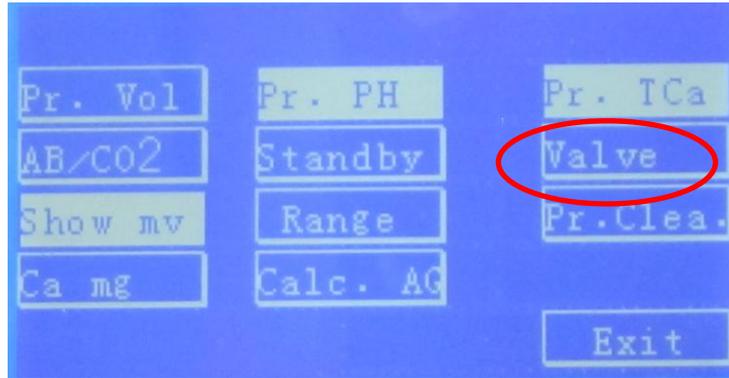


Figure 3-16

3.2.2 Check the liquid tubing step by step

Pull out the connecting tube located at the right hand side of the Ref electrode block. Put the tube into a cuvette filled with distilled water. Then press **Valve** , observe if the distilled water is aspirated into the tube or not.

Check if the tube is blocked.

- Check if the connectors of tubes are reliable or broken. If necessary, reconnect or replace it.
- Check if the pump tube gets stuck or not, if yes, rub the tube.
- Check if the pump tube is used. If yes , replace with a new one.
- Check if the pump tube is blocked or not. Take out the reagent manifold, check if the waste outlet is blocked or not. If necessary, clean it.

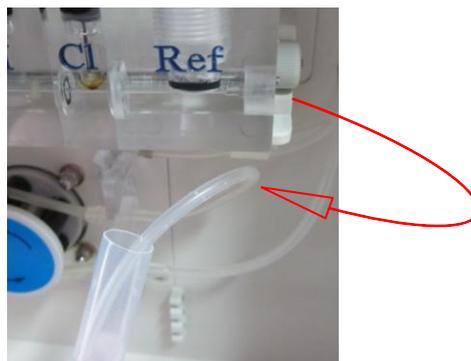


Figure 3-17

Check if the sample tube is blocked. Pull out the sample tube from sample probe. See fig.3-18.

Press **Valve** , observe if the distill water is aspirated into the tube or not.

- Check if the connector of tube is broken. If necessary, replace it.
- Take out the electrode assembly. Check if the electrode channel is blocked or not. Refer to

3.4.5 .



Figure 3-18

Check if the liquid distribution outlet is blocked. Pull out the tube connect to liquid distribution valve. See fig.3-19. Press **Valve** , if the distilled water is aspirated or not. If yes, it means that the liquid tubing is good. Otherwise, it is stuck.

- Check if the sample probe is clogged. Take off and check the probe,
- Check if the washing block is blocked or not. Disassemble and check the washing block.
- Check the reliability of connection tube . If necessary, replace it.



Figure 3-19

After checking as indicated above. Reconnect the tube. If the liquid tubing is still blocked,

Analysis:

- Check if the connection of liquid distribution valve inlet unreliable or broken. Reconnect or replace it.
- Check if the connector of reagent pack is reliable or blocked. If necessary, reconnect or replace it.
- Liquid distribution valve inlet or outlet blocked. See fig.3-20. Press **Valve** .



Figure 3-20

After checking as indicated above. If the liquid tubing is still blocked, check the liquid distribution valve. Refer to 3.5.2 . If necessary, replace the liquid distribution valve.

3.3 Print-out error code

3.3.1 “Error 0# ”Positioner failed

See fig.3-21. The positioning solution should be about 2 cm from the electrode inlet level.

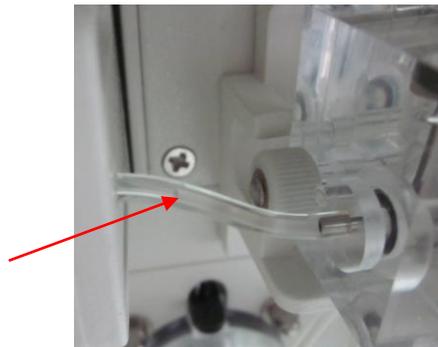


Figure 3-21

Solution:

- Check if the connection with positioner is reliable, if necessary, reconnect it.
- Refer to 3.5.5 , check if the positioner is damaged or not, if necessary, replace it.
- Refer to 3.2.2 , check if the liquid tubing is blocked.
- Check if the pump tube gets stuck or gets aged, rub it or replace it.

3.3.2“Error 1#”, Liquid detecting failed

- Positioner is loose, turn off the instrument and connect it firmly again;
- There is dust in the positioner. Clean it;
- There is too much protein in the aspiration tube, clean the tube or replace it.
- Positioner is broken, replace it.

3.3.3 “Warn 2# ”, Bubbles detected

Check if there is leakage or blockage in the tubing system (refer to 3.2.2) .

Cause: The washing block, sample probe and electrode channel blocked. The connector of tubing blocked.

Solution: Remove the deposit or reconnect the tube.

3.3.4 “Error 3#”, Aspirated too much or less sample

Positioner is failed or liquid tubing is blocked. Refer to 3.3.3 .

3.3.5 Displays Error 4#、Error 5#

After run STD, print-out report displays

“Error 4# ”: Slope abnormal

“Error 5# ”: Slope unstable

1) Analysis for new instrument:

Cause: The performance of new electrodes unstable.

Solution: Run STD for several times, the measuring results will be good.

If the slope of all the electrodes exceed normal range, please check by following steps.

- Check if the reagent pack is correctly installed;
- Check if the connection of tubing system and electrode assembly is correctly done or not.

See fig.3-22;

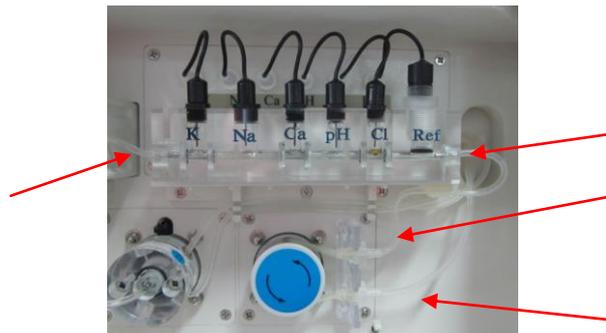


Figure 3-22

- Make sure that there is no bubble at the bottom of each electrode.

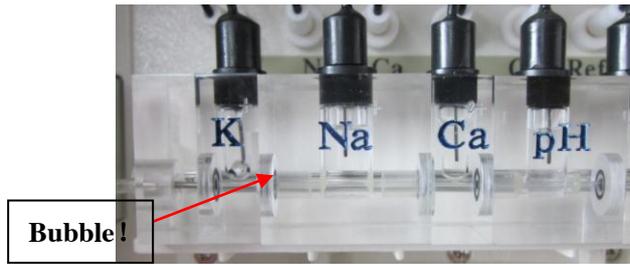


Figure 3-23

- Check if the input voltage of instrument is correct. If necessary, connect to external stabilizer device ($\geq 500W$) or UPS power supply.
- Check Voltage, check if the voltage of each electrode is stable. And the difference between two values should be less than 0.2mV. In case of bad grounding (or Ref electrode problem) the variation of voltage can be 0.2~1.0mV or more (Na voltage variation could be the highest one). Refer to 3.4.6 for solution related to Ref electrode problem.
- Make sure the grounding line is properly connected.

For a new installation instrument, it will take 15-30 minutes for the electrodes to be activated. If the slope of Na^{++} is less than 50, use Na conditioner for a conditioning operation. All the components should work properly. Make sure the power voltage and grounding are reliable.

2) Analysis for instruments already in service

- Check liquid tubing. Refer to 3.5.2.
- Check if there is still reagent in the reagent pack. If necessary, replace it.
- Check the performance of positioner. Refer to 3.5.5 .
- Check the liquid distribution valve. Refer to 3.5.2 .

3.4 Check the electrodes

3.4.1 Check the electrode voltage

Cause: Electrodes expired, filling solution insufficient, internal electrode expired. They may cause the voltage not good. Check voltage, observe if the voltage of each electrode is good or not.

Aspirate Std A or QC solution. Let the electrode voltage fluctuate for 10 seconds, and make sure the voltage remains finally stable. The gap should be less than 0.2. And the voltage of each electrode should be more than 30.

If the voltage of one measuring electrode is unstable, it means that the electrode in question encounters some problem.

If the voltage of ALL measuring electrodes are unstable or low(less than 30), it means that the reference electrode encounters some problem.

3.4.2 Check Voltage:

Enter the **Service** menu (Fig.3-24), press **Voltage**,

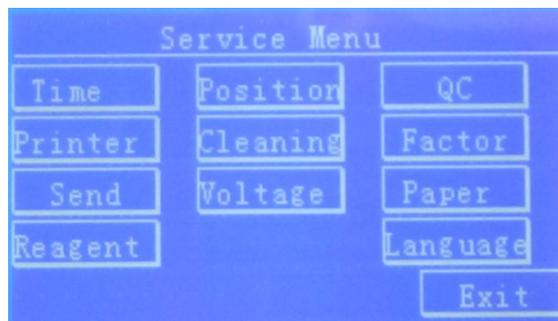


Figure 3-24

See fig.3-25. Press **Aspirate** to aspirate QC solution and check the voltages of each electrode.

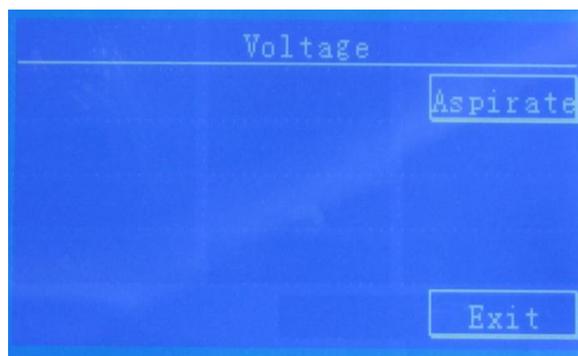


Figure 3-25

Remove the QC solution from the sample probe , see fig.3-26.

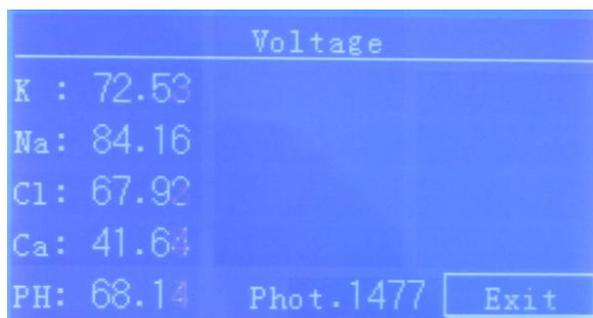


Figure 3-26

3.4.3 Check the filling solution

Check if the filling solution is sufficient or contaminated.

Solution : Remove the old filling solution, then add filling solution to 2/3 of total volume. Make sure **NOT** to damage the electrode membrane by the pipette tip during refilling operation. Then put the internal electrode back and tighten it.

Make sure that there is no bubble at the bottom of the electrode. If there is any filling solution overflowed, wipe it with clean tissue.

3.4.4 Check the internal electrode

Check if the connection between the internal electrode and amplifier board is reliable or not. If the probe show some oxidation on the surface (see fig.3-26), use filter paper to remove oxidation layer; If the connection is unreliable or loose, replace internal electrode or internal plug; check the internal electrode and make sure it doesn't turn into white on its surface (see fig.3-26), doesn't flake off . Replace it if necessary.



Figure 3-26

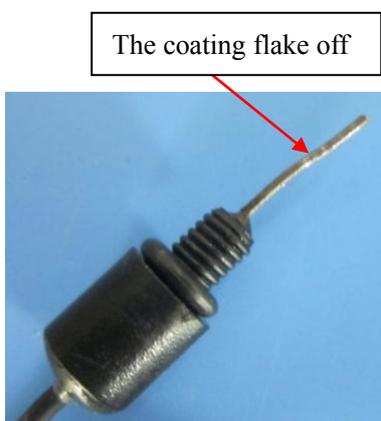


Figure 3-27

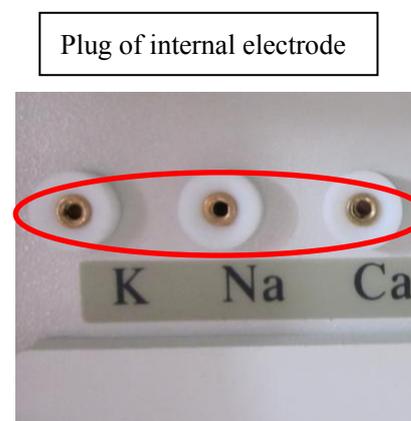


Figure 3-28

3.4.5 Check the electrode channel

If the voltage of the electrode is still unstable after the above checks, take out the electrode from the electrode assembly to check its sample passing channel. Clean it if there is protein deposit inside and make sure not to damage the electrode membrane during the operation.

How to clean the electrode channel

- Run 'Deprotein' program to clean the electrode channel, clean it with Deprotein solution
- Use a pinhead of injector fill with distilled water or syringe to inject water from one side of the electrode channel and the deposit will come out from another side.(See fig.3-29,3-30)



Figure 3-29



Figure 3-30

- Use a cotton thread, pull from both sides to remove the deposit protein. (See fig.3-31)

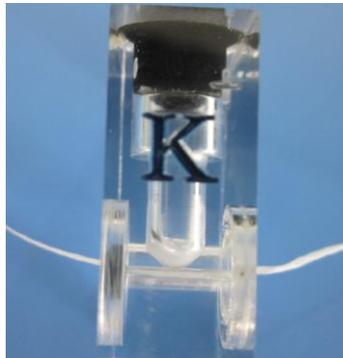


Figure 3-31

- If the blockage of electrode channel is very serious. See fig.3-32. With a small injector remove the deposit. Make sure **NOT** to damage the membrane of the electrode.



Figure 3-32

Note:

The stainless probe delivered with the instrument **CANNOT** be used to remove the deposit of electrode channel. It could damage the membrane of the electrode.

3.4.6 Check the reference electrode

Replacement of reference electrode filling solution and internal electrode are same with other electrodes.

Note:

- The reference filling solution is only available for reference electrode;
- The internal electrodes of all electrodes are interchangeable, including Ref electrode.

Therefore, we can exchange internal electrodes to judge if the internal electrode is good.

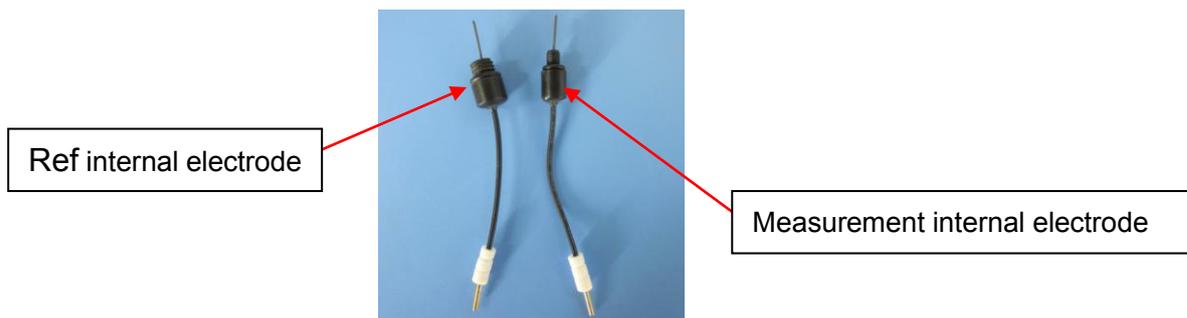
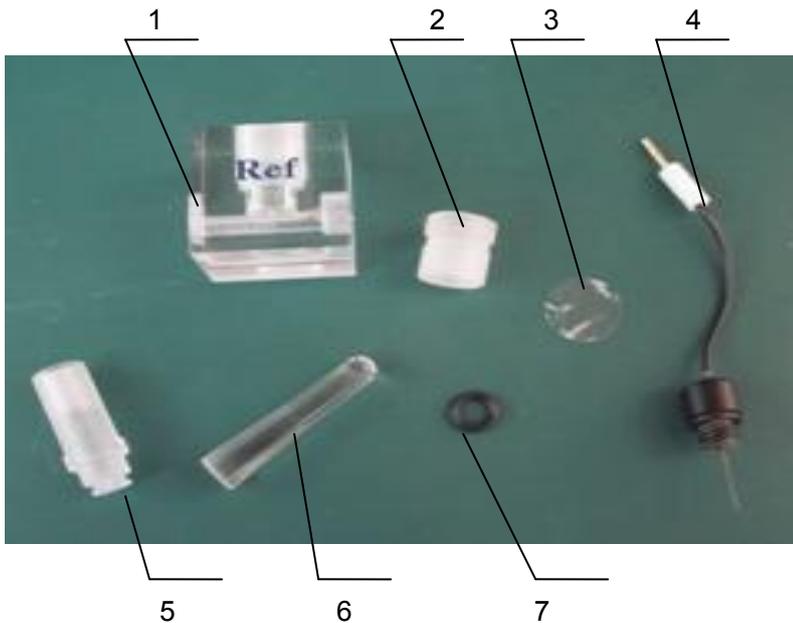


Figure 3-33

3.4.7 Replacement of the reference membrane:

See following figures:

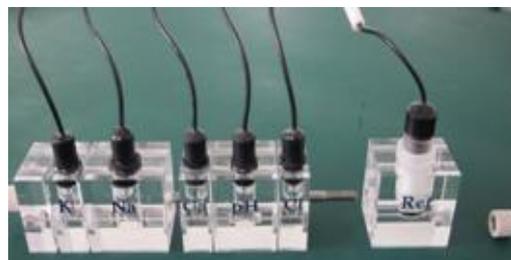
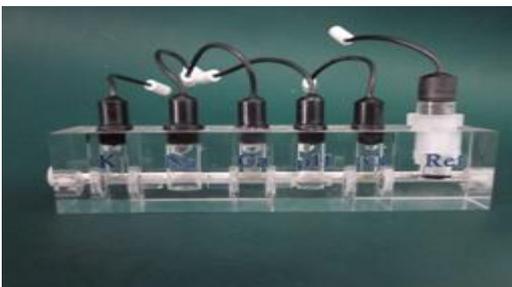


1. Ref 2. Screw cap 3. Reference membrane 4. internal electrode 5. Internal interface
 6. Fitting tool 7. "O" ring

1) Open the front door, then pull out the lead wires of electrodes from the plugs. Remove the tubes from the incoming and outgoing of the electrode assembly. See the following figure:



2) Loosen the fixing nuts of the electrode assembly and take out the reference electrode. See the following figure:



3) Loosen the screw cap, take out the internal electrode, and remove the filling solution, O-ring and old reference membrane. Clean the internal interface and Ref with distilled water, and wipe it with clean cotton or tissue.

4) Place a new reference membrane in the distilled water to get it softened.

5) Place the fixed reference membrane into fitting tool with 'O' ring. See the following figure:



6) Convert the internal interface and put the reference membrane on the top of it. See the following figure:



7) Connect the fitting tool with the internal interface and pull the 'O' ring onto the internal interface. See the following figure:



8) Remove the interface. Make sure that the reference membrane is smooth and not damaged. See the following figure:



9) Put the internal interface into Ref vertically, and then tighten the screw cap. See the following figure:



- 10) Fill the internal interface with reference solution with an syringe (up to 2/3 of the total volume excluding the bubbles in the bottom)
- 11) Screw on the reference internal electrode. If there is any filling solution overflowed, wipe it with clean tissue. Otherwise, it will produce white salt crystals after evaporation of water and might affect test results.
- 12) Re-assemble the electrodes in correct order, tighten the fixing nuts, and then re-install the incoming and out-coming tubing. Insert all the wires into the plugs. Run calibration again.

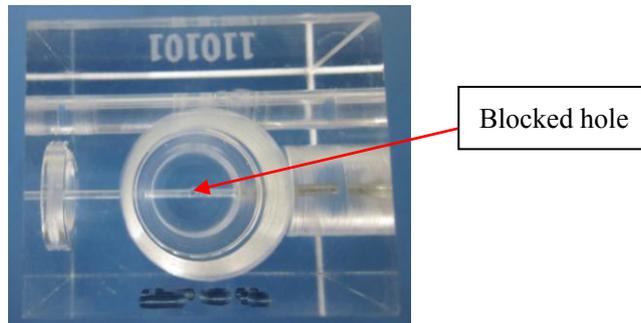
Notes: The instrument may give “Error” signals in the first calibration after replacement of the membrane. In this case, perform calibration again and the results will be good. If the results are still not good after several calibrations, check as following:

- Check whether the reference membrane is properly replaced. Replace it if necessary.
- Check whether the reference filling solution is invalid or contaminated. Replace new reference filling solution if necessary.
- Check whether there is bubble at the bottom of the reference electrode. Remove the bubble.
- Check the internal electrode and make sure its coating doesn't flake off. Change it if necessary.

Note:

- ★ Order of replace the membrane: place the membrane→ place the internal interface onto the Ref→ tighten screw cap→ inject Ref filling solution→ tighten internal electrode
- ★ Take a piece of new membrane with a pair of tweezers, soften it with distilled water for some seconds, then tighten internal electrode. Clean the Ref electrode with clean tissue.
- ★ Look at below figure. At the area of the hole located between the membrane and the liquid flow, some deposit of protein can be found; its color is dark red, easily identified. During the replacement of the reference membrane procedure, check and clean the sample passing hole with a pinhead

firstly. Make sure **NOT TO** damage the electrode channel.



3.5 Replacement of broken components

3.5.1 Voltage regulator tube 78T12 broken

Switch on the power, the LCD display properly, but the lifting, liquid distribution valve and pump cannot work.

Cause: There is no NBQ socket on the mainboard, without 12V output.

Solution: Replace the 78T12.

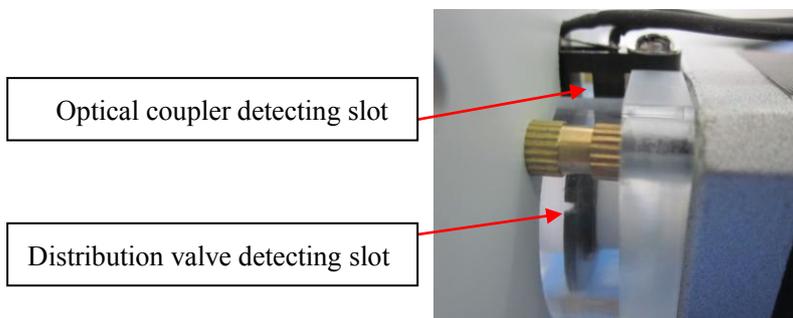
3.5.2 Display error“1#”

Liquid distribution valve optical coupler error

Phenomena: Run 'STD' or measurement, display“1# ”

Cause: The main board cannot detect the optical coupler of the distribution valve.

- Clean the distribution valve;



- Check if the optical coupler is broken or not. Replace it.
- Check if U107(2803 integrated block) is broken or not. Replace it.
- Replace the motor of distribution valve if it's defective.

Check the liquid distribution valve

Test **Valve** (Refer to 3.2.1) .

Check if the liquid distribution valve works normally or not.

Check if the liquid flow is normal or not.

Incoming Std A and Std B tubings: Check if Std A and Std B can move into the distribution valve correctly or not. If it is not moving, check the tubing itself and check if the valve holes are clogged or not. If necessary, unclog the tubing with water injection by a syringe.

Clean the liquid distribution valve by professional personnel

When a new instrument is started up for the first time, the instrument may show “1#” before it enters into self-calibration procedure. The probability for this error is common when the duration (from the instrument’s packaging date in the factory to the first start-up date in the customer’s place) is long.

The valves have been manufactured in different seasons (temperature difference). Temperature changes make difference on the coefficients of heating or cooling of the valves size fitness. Furthermore, the rotational resistance increases if the valve does not work for a long time and it makes the valve difficult to rotate in its first start-up. Therefore, the instrument shows “1#”.

There are two solutions for this failure:

- 1) Repeat 2-3 times of switching on and off the instrument within the switching interval time required in the manual.
- 2) Turn off the instrument. Remove the A, B standard tubes in the valve; with a syringe, inject some distilled water into the A, B standard tubes (making the valve wet, thus reducing the rotational resistance). Then re-connect the A, B standard tubes in the valve and start up the instrument again.



3.5.3 Displayed“2#”

2# means : Lifting limit switch failed

- Check if the connection with J102 is reliable.
- Limit switch broken. Replace it.

3.5.4 Displayed“3#”、“4#”

3 # means : Auto sampler optical coupler failed,

4 # means : Auto sampler measurement cup optical coupler failed

- Check if the connection between auto sampler and mainboard is reliable. If necessary, reconnect it (J103、J104).
- Check if the data line between auto sampler and the instrument is reliable or damaged. If necessary, reconnect or replace the data line.
- Check the reliability of J112 plug. If necessary, reconnect it.
- Replace the 2803 integrated block.

3.5.5 Check the positioner

Enter “Voltage” menu. Refer to 3.4.2 . Aspirate Std A or QC solution, and then rotate the peristaltic pump manually clockwise and counter clockwise to let the liquid or air passes through the positioner. At the same time, observe the values change in the screen. When the air passes through the positioner, the value should be higher than that of the liquid.

The voltage of positioner should be: $\text{Low Value} \times 2 < \text{High Value} (<1500)$

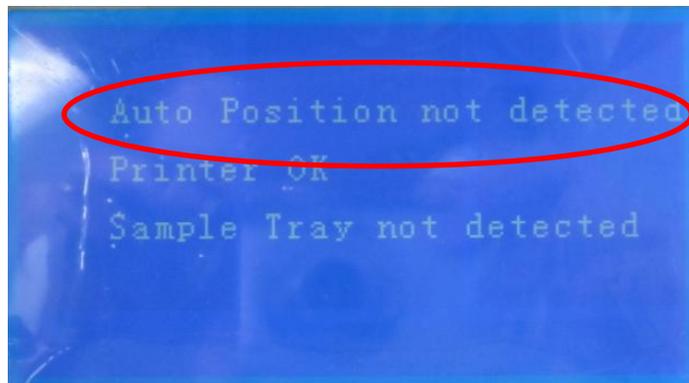
If the gap is very small between high value and low value, it means that the positioner is not working properly. The possible reasons: ① the positioner connection is not good (replug the

positioner or connect it in another direction) ② the socket for the positioner in the instrument broken
③ the socket connection with the main board unreliable. In addition, if there is dust in the positioner
hole or too much protein in the sampling tube, clean the dust or replace the tube.

If the positioner fails, the instrument will not enter STD program and warn this in the
self-detection after power-on the instrument. In addition, for emergency usage, perform the
positioning procedure manually according to the operation manual.



If the positioner failed, the screen displays, see below figure. The instrument will not enter STD
program.



When the user does not resolve the fault, pull out the positioner , then user can position by manual
(The method refer to operating manual).

3.5.6 After switch on the instrument, it doesn't work

- The fuse is broken. Replace the fuse (2A/250V) .
- The transformer output is abnormal.

Output AC voltage:

Palm-Green line 15V Palm-Green line 15V Black-Black line 15V Red-Red line 8V



The lead wire of 78T12

If the voltage of transformer exceeds the range, replace the transformer.

3.5.7 LCD screen no display or abnormal display

- The lead wire of LCD module connect to mainboard is problematic or broken. Reconnect or replace it.
- Check the screws of LCD display assembly. Don't tighten the screws too much.
- The data line of LCD display is loose. Reconnect it.
- LCD display is broken. Replace it.

3.5.8 Touch screen doesn't work

- Check the screws of display assembly. Don't tighten the screws too much.
- The data line of touch screen is broken. Replace it.
- The touch screen is broken. Replace it.

3.5.9 No print-out

- In the **Service** menu, press **Printer** to turn on the printer switch .
- The PCB board is broken. Replace it.
- The printer is broken. Replace it.

Chapter 4 Troubleshooting index

Item	Cause	Solution index
------	-------	----------------

1、	When switch on the instrument. Touch screen is good, but lifting, sample pump and liquid distribution don't work.	Refer to 3.1.1
2、	Power-on, no back light	Refer to 3.1.2
3、	Lifting and liquid distribution valve don't work	Refer to 3.1.3
4、	The motor of sample pump doesn't work	Refer to 3.1.4
5、	STD , measuring result confusion or zero	Refer to 3.1.5
6、	Program confusion, the instrument doesn't work properly.	Refer to 3.1.6
7、	Auto sampler doesn't running or abnormal	Refer to 3.1.7
8、	No print-out	Refer to 3.1.8
9、	The date of Display or print-out is not correct.	Refer to 3.1.9
10、	Error 0#	Refer to 3.3.1
11、	Error 1#	Refer to 3.3.2
12、	Warn 2#	Refer to 3.3.3
13、	Error 3#	Refer to 3.3.4
14、	Error 4#	Refer to 3.3.5
15、	Error 5#	
16、	The screen displays“1# detecting failed”,	Refer to 3.5.2
17、	The screen displays “2# detecting failed”	Refer to 3.5.3
18、	“3# detecting failed”	Refer to 3.5.4
19、	“4# detecting failed”	
20、	Switch on the instrument, it doesn't work	Refer to 3.5.6
21、	The screen doesn't display or abnormal	Refer to 3.5.7
22、	Touch screen doesn't work	Refer to 3.5.8
23、	No print-out	Refer 3.5.9

Chapter 5 Extended menu

5.1 Extended menu

Menu → → → input“983”, then press .

Choose whether to print the standard solution A, B standard solution and sample potential.

-
- Pr. pH** Choose whether to print out PH value.
 - Pr. TCa** Choose whether to print out TCa value.
 - Standby**
 - a) Enter 'Standby' menu key in "20" then press **Yes**. It means that the "Standby" mode will be activated within 20 minutes if no testing is done. Factory settings is 20 minutes. **2-60** minutes for selection only.
 - b) Calibration frequency: Enter **Standby** mode, key in "9831**Yes**", it means every 1 hour, the instrument automatically run STD one time. Key in "9832**Yes**", it means every 2 hours, the instrument automatically run STD one time. 1—8 hour for selection..

If calibration every 4 hours is selected, the printer is not going to print out the message(note: the default setting is 4 hours). When the setting are done, turn off the instrument. Then restart the instrument. The revised information should be print-out.
 - Valve** Test valve function.
 - Show mv** Choose whether display the voltage of each electrode after run STD.
 - Range** The reference value of serum can be changed.
 - Pr. clea.** Print out the last date the de-proteinisation program has been performed. And print out the quantity of sample measurement.
 - Ca mg** The unit of Ca result can be changed(mmol/L switch to mg/dl).
 - Calc.AG** Choose whether display or print out AG value.

5.2 How to convert STATLYTE CD to STATLYTE CC and vice versa.

Menu → **Service** → **Time** → key in password to press **Exit** .

Model	Password
STATLYTE CD-----	98398.0
STATLYTE CC-----	98398.1
STATLYTE CB-----	98398.2
STATLYTE CF-----	98398.3

Note: (a) Decimal point automatically input by the instrument!

(b) The instrument for measure K^+ 、 Na^+ 、 Li^+ can not change the system by the password.
Unless replace the mainboard.

Chapter 6 What should there be in the user's feedback?

Integrated report or figure is the best information.

1、 The interface of instrument abnormal.

Provide your operating steps .

2、 STD or measuring result abnormal, please provide the following information.

1) Instrument version

2) Serial No.

3) Electrode Lot No.

4) Reagent Lot No.

5) STD result of continue 3 times STD

6) Measure QC solution, three times measuring results continuously.

7) Provide the factor

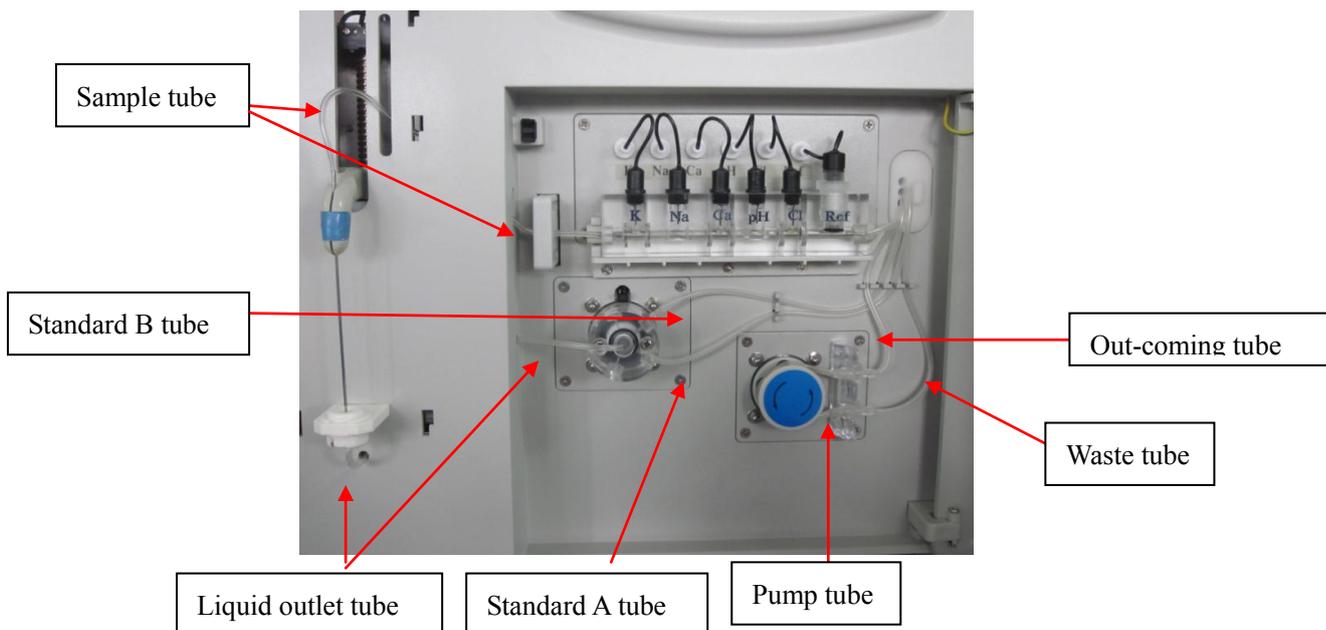
8) Analysis and Solution.

Chapter 7 The contents of filling solution for each electrode

K、 Ca、 Cl、 Li:	300uL
Na:	1200 uL
pH:	700 uL
Ref:	650 uL

Chapter 8 The tubes and components of instrument

8.1 The position of connecting tube

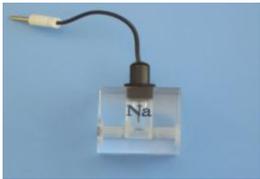


8.2 Specification

Item	Description	Material	Length (mm)
1	Sample tube	Tegon	200
2	Standard A tube	Silica gel	290
3	Standard B tube	Silica gel	320
4	Liquid outlet tube	Tegon	200
5	Pump tube	Silica gel	80

6	Waste liquid tube	Silica gel	265
7	Outcoming tube	Silica gel	130

8.3 Figure of components

Item	Component	Figure
1	K electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'K' is visible on the front.
2	Na electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'Na' is visible on the front.
3	Cl electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'Cl' is visible on the front.
4	Ca electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'Ca' is visible on the front.
5	pH electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'pH' is visible on the front.
6	Li electrode	 A small, clear plastic electrode with a black cap and a black cable. The label 'Li' is visible on the front.

7	Reference electrode	
8	Measuring internal electrode	
9	Ref internal electrode	
10	Reference membrane (10pcs/pouch)	
11	O-ring fitting tool	
12	Measuring Electrode O-ring	
13	Ref electrode O-ring	

14	Electrode adaptor (Large)	A clear plastic rectangular component with two gold-colored electrodes protruding from the top.
15	Electrode adaptor (Narrow)	A clear plastic rectangular component, narrower than the large one, with two gold-colored electrodes protruding from the top.
16	Electrode holder (Large)	A white plastic tray-like component with two raised edges and a central slot.
17	Electrode holder (Narrow)	A white plastic tray-like component, narrower than the large one, with two raised edges and a central slot.
18	Sample probe	A long, thin metal needle with a green plastic cap at one end.
19	Reagent pack manifold	A white plastic component with a long, thin tube and a small valve at the end.
20	Reagent pack plastic connector(Right angle)	A small white plastic L-shaped connector.
21	Optical coupler for Liquid distribution valve	A black cable with a connector at one end and a small red light at the other.

22	Positioner	
23	Positioner socket	
24	Washing block assembly	
25	Wash rubber	
26	Pump head	
27	Pump step motor	
28	Liquid distribution valve	
29	Motor for liquid distribution valve	

30	Liquid distribution valve assembly	
31	Lifting step motor	
32	CAM Switch	
33	Lifting assembly	
34	Touch screen data line	
35	LCD screen	
36	LCD screen data line	
37	LCD screen assembly	

38	Printer	
39	Printer circuit board data line (27cm)	
40	Printer circuit board power cable	
41	Printer circuit board	
42	Transformer	
43	K/Na/Cl (Li) Amplifier board	
44	Li/K/Na/Cl Amplifier board	
45	K/Na/Ca/pH/Cl Amplifier board	

46	Amplifier board data line	
47	Mainboard	
48	220V/110V power adapter	
49	Power switch	
50	Power socket	
51	Fuse	
52	Auto sampler data line(38cm)	
53	Auto sampler internal connecting cable	

54	Auto sampler (main unit)	
55	Auto sampler tray	
56	Auto sampler cup	
57	Auto sampler bottom plate	
58	Pack sensor	
59	Pump tube	
60	Upper cover	
61	Lower cover	

62	IC2803	
63	SD2200EP	
64	78T12	