NB-201
CHEMISTRY ANALYZER

SERVICE MANUAL

Copyright

Responsibility on the manufacturer party

KAITE is responsible for safety, reliability and performance of this equipment only in the condition that:

- all installation, expansion, change, modification and repair of this equipment are

conducted by KAITE qualified personnel;

- applied electrical appliance is in compliance with relevant National Standards;
- the instrument is operated under strict observance of this manual.

⚠ **Note** ⚠

This equipment is not intended for family usage.

This equipment must be operated by skilled/trained clinical personnel.

⚠ **Warning** ⚠

It is important for the hospital or organization that employs this equipment to carry out a reasonable maintenance schedule. Neglect of this may result in machine breakdown or injury of human health.

Upon request, KAITE may provide, with compensation, necessary circuit diagrams, calibration illustration list and other information to help qualified technician to maintain and repair some parts, which KAITE may define as user serviceable.

Warranty

1.1.1.1. Workmanship & Materials

KAITE guarantees new equipment other than accessories to be free from defects in workmanship and materials for a period of one year from date of shipment under normal use and service. KAITE's obligation under this warranty is limited to repairing, at KAITE's option, any part which upon KAITE's examination proves defective.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

1.1.1.2. Exemptions

KAITE's obligation or liability under this warranty does not include any transportation or other charges or liability for direct, indirect or consequential damages or delay resulting from the improper use or application of the product or the substitution upon it of parts or accessories not approved by KAITE or repaired by anyone other than a KAITE authorized representative.

This warranty shall not extend to any instrument which has been subjected to misuse, negligence or accident; any instrument from which KAITE's original serial number tag or product identification markings have been altered or removed, or any product of any other manufacturer.

Safety, Reliability and Performance

KAITE is not responsible for the effects on safety, reliability and performance of the NB-201 chemistry analyzer if:

- Assembly operations, extensions, re-adjusts, modifications or repairs are carried out by persons other than those authorized by KAITE.
- Personnel unauthorized by KAITE repairs or modify the instrument.

Return Policy

Return Procedure

In the event that it becomes necessary to return a unit to KAITE, the following procedure should be followed:

1. Obtain return authorization. Contact the KAITE Service Department and obtain a Customer Service Authorization (KAITE) number. The KAITE number must appear on the outside of the shipping container. Return shipments will not be accepted if the KAITE number is not clearly visible. Please provide the model number, serial number, and a brief description of the reason for return.

2. Freight policy. The customer is responsible for freight charges when equipment is shipped to KAITE for service (this includes customs charges).

Company Contact

Address: Floor 7, Building 1, Beishan Industry Zone, Beishan Road, Yantian, Shenzhen, P. R. China

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Safety Caution

Warnings, Cautions and Notes

Warnings, cautions and notes are used in this manual to alert or signal the reader to specific information.

⚠ WARNING ⚠

Warning alerts the user to the possible injury or death associated with the use or misuse of the instrument.

⚠ CAUTION ⚠

Caution alerts the user to possible injury or problems with the instrument associated with its use or problem such as instrument malfunction, instrument failure, damage to the instrument.

⚠ NOTE ⚠

Note provides specific information, in the form of recommendations, pre-requirements, alternative goods or supplemental information.

⚠ WARNING ⚠

Potential biohazard

⚠ WARNING ⚠

Avoid contacting with the sample probe.

Table of Contents

Chapter 1 General

1.2. Introduction

The NB-201 semi-auto chemistry analyzer is a stable and precise laboratory instrument. It features:

- multiple analysis methods: end point, kinetic, fixed time and absorbance
- Linear and non-linear standardization
- Touch screen and large LCD
- Measurement precision of 0.0001ABS and calculation precision of 0.00001ABS
- Anti-vibration and anti-disturbance optical system that guarantees highly accurate and reliable results
- Display of reaction curve
- Lamp saving feature that prolongs lamp life largely
- Comprehensive quality control program, Levey-Jenning graphics included
- Audible / visual alarm
- Built-in high-speed thermal printer
- Open reagent.

1.3. Specifications

LIGHT SOURCE

- Quartz-halogen lamp 12V/20W

WAVELENGTH RANGE

- Automatic by 8- position filter wheel
- 7 standard filters: 340, 405, 492, 510, 546, 578, 630nm
- 1 position free for optional filter
- Half bandwidth < 8nm
- Stray light: < 1.0 % @ 340 nm

PHOTOMETRIC RANGE

- 0.0000 to 3.0000 ABS
- Resolution: 0.0001 ABS
- Drift: 0.002 A/hour

FLOWCELL

- Stainless steel body with quartz window
- Measuring volume 32 uL
- Aspiration volume programmable: 200 – 2000 uL
- Optical path 10mm

ANALYSIS METHOD

- End point, with or without reagent blank
- End point, with sample blank and with or without reagent blank
- Kinetic, with or without linearity check
- Kinetic and fixed time, with or without reagent blank
- Absorbance

- Turbidimetry
- Linear and non-linear standardization

PARAMETER SETTINGS

- Method
- Wavelength
- Temperature
- Reagent blank y/n
- Sample blank y/n
- Delay time
- Measuring time
- Reaction type
- Absorbance limit
- Aspiration volume
- Standards
- Linearity check
- Unit for results

MEMORY

- 3000 results

TEMPERATURE CONTROL

- By means of Peltier elements
- 25, 30, 37 °C optional
- Precision: +/- 0.1°C

INPUT

- Touch screen

DISPLAY

- Large LCD

PRINTER

- Built-in thermal printer

INTERFACE

- RS232 serial port

OPREATING ENVIRONMENT

- Temperature: 15 – 30 °C
- Humidity: 20 – 80 %

POWER REQUIREMENT

- AC 220V +/- 10%, 50/60Hz
- AC 110V +/- 10%, 50/60Hz

Chapter 2 System Description

2.1 Overview

Unscrew the13 screws which fix NB-201 casing and place the top casing as Figure 2-1 shows.

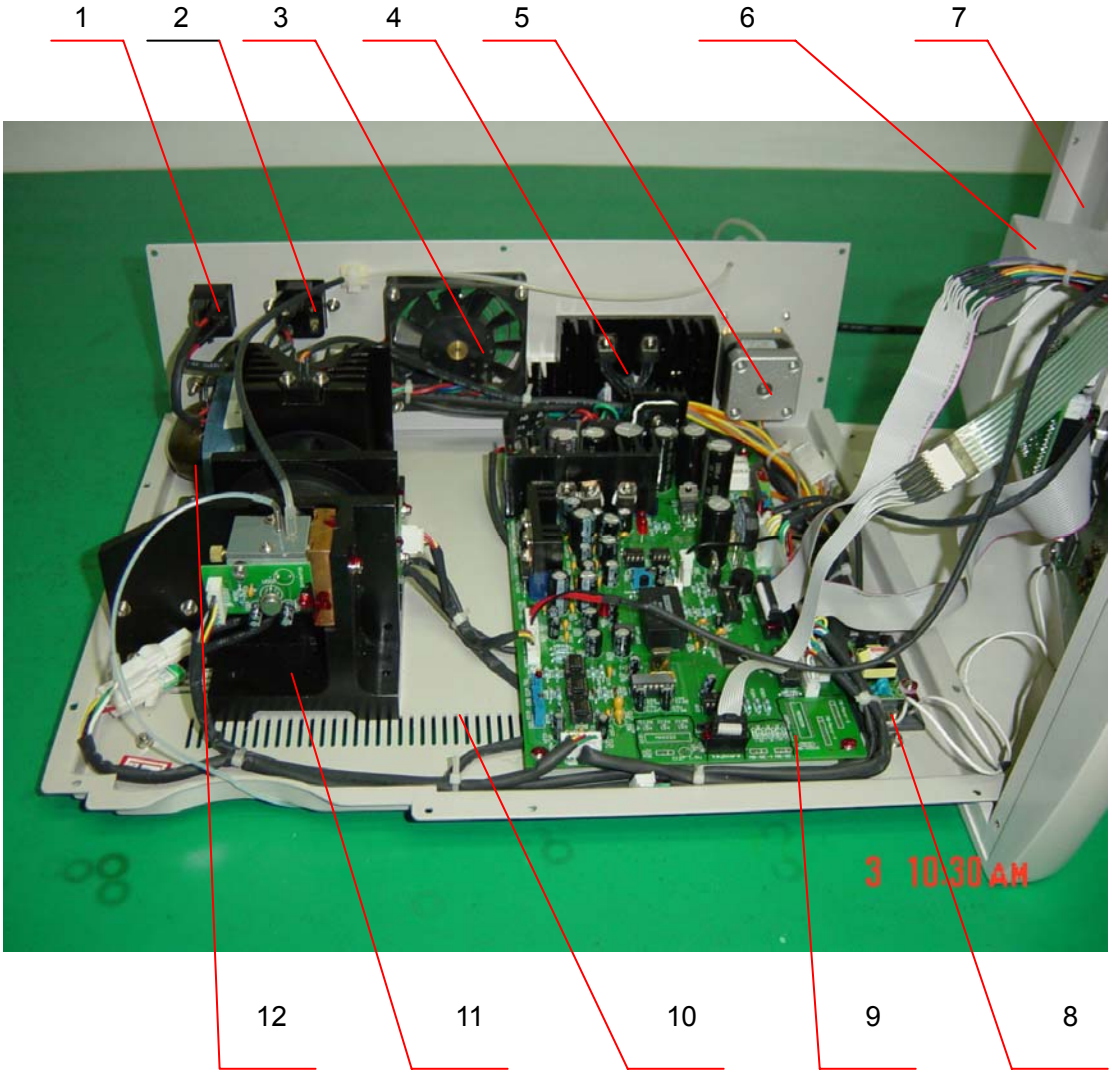

Figure 2-1 Overview of NB-201 inside

1. Power switch 2. Power plug 3. Fan 4. Radiator 5. Peristaltic pump 6. Printer box 7. Top casing 8. Inverter 9. Main board 10. Bottom casing 11. Optical system 12. Transformer

2.2 Main Board

1. The picture of the main board is shown in Figure 2-2.

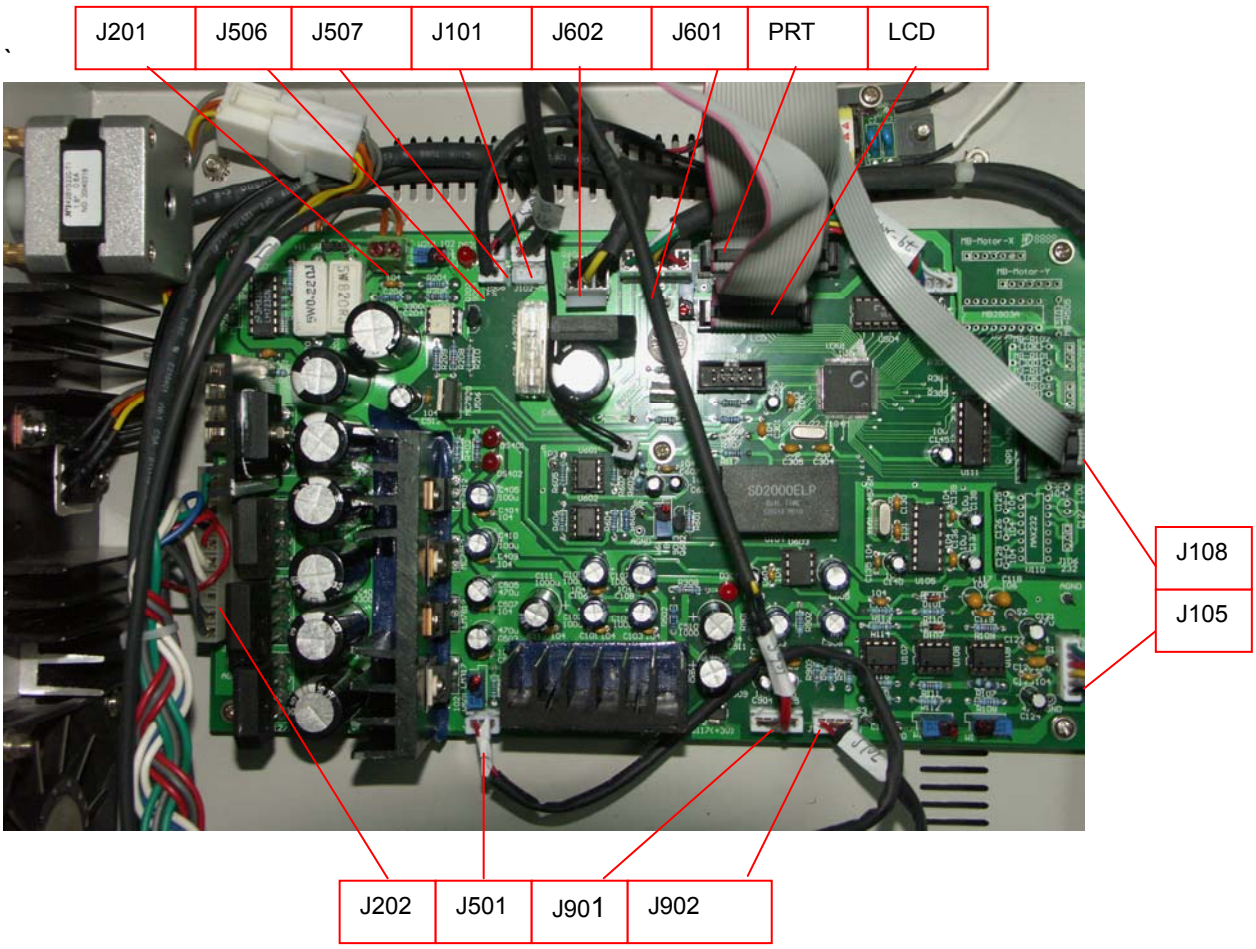

Figure 2-2 Main Board

2. See the table below for the functions and voltages of the jumpers on the board.

Pin number	Function	Voltage
J101	Supplies power to thermal printer.	±5V
J105	Connects amplifying board	±12V
J108 (KEYBOARD)	Connects touch screen.	5V
J201	Supplies power to light source.	11.5V
J202	AC input	Black～Black: 15V Red～Red: 8V Green～Brown: 18V Brown～Green: 18V Blue～Blue: 17V
J501	Connects motor of chopping wheel	6V
J506	Connects inverter	±12V
J507	Connects fan	+12V
J601	Connects temperature sensor	12V

	of flow cell	
J602	Supplies power to heating/cooling device.	Yellow～white: 8V White～yellow: 8V
J901	Connects start key	5V
J902	Filter wheel positioner	—
Q601/TIP122	Pin C～Pin B	10V
Q202/TIP142	Pin C ～ Pin B	4V
PRT	Connects data line of printer	—
LCD	Connects data line of LCD	—

2.3 LCD and Touch Screen

See Figure 2-3 for a picture of the LCD and the touch screen. The LCD is powered by a 20V supply and the touch screen by a 5V.

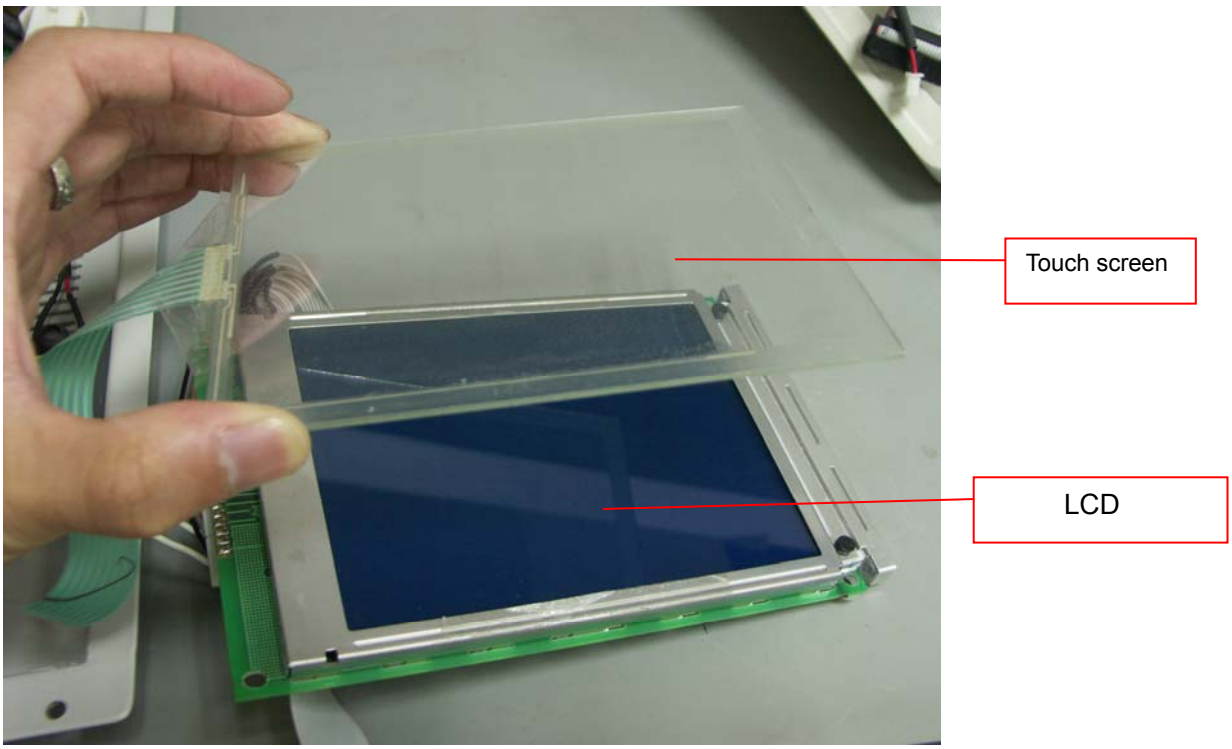

Figure 2-3 LCD and Touch Screen

1. The LCD and the touch screen are two separate parts.
2. The touch screen is fixed on the LCD.
3. The LCD is fixed by 4 screws and can be dismounted by removing them. Be sure to protect the data line of the touch screen when dismounting the LCD.

2.4 Optical System

The optical system consists of a light source, chopping wheel, filter wheel and its motor, flow cell, amplifying board, and heating/cooling device. See Figure 2-4 for a picture of the system.

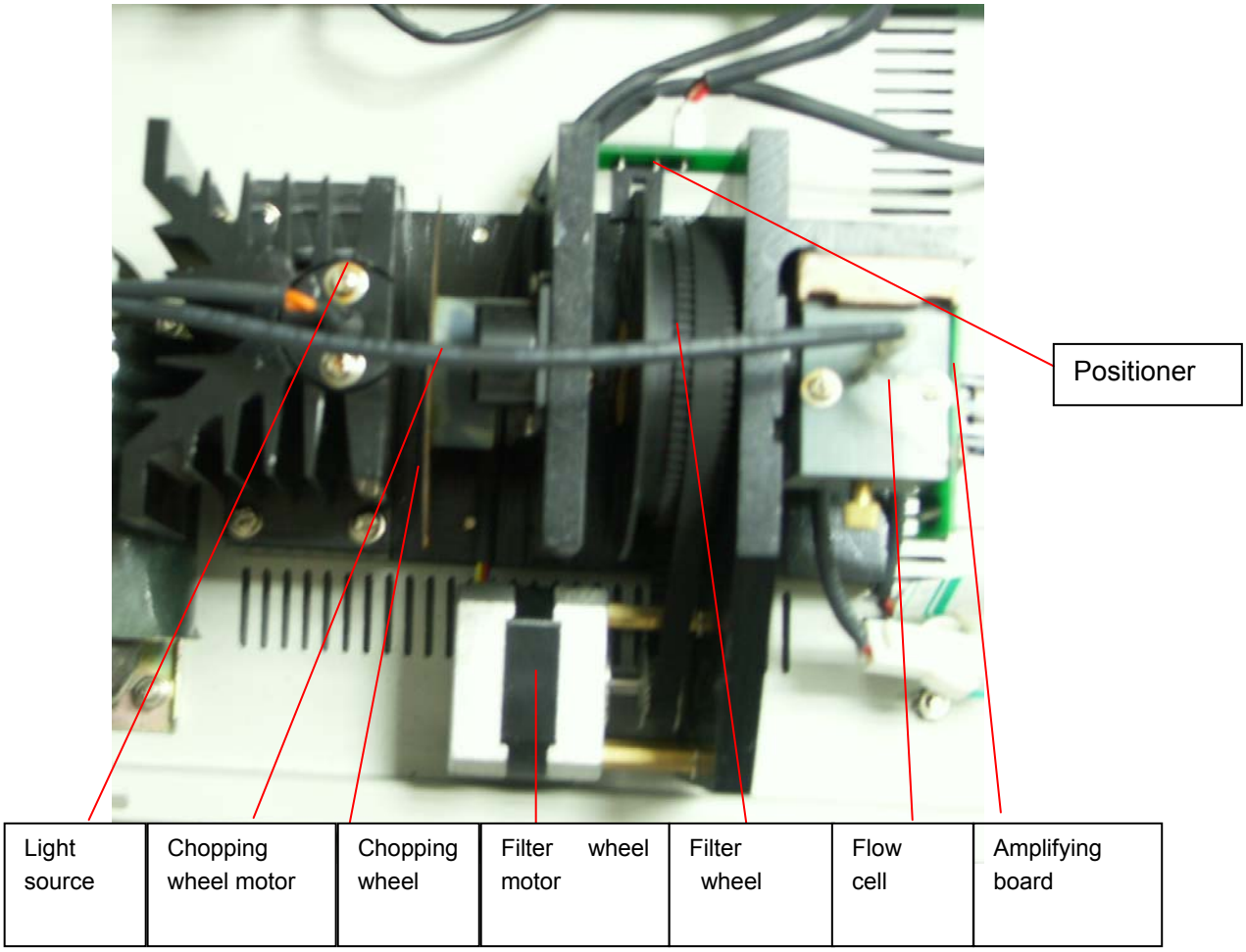

Figure 2-4 Optical System

Power supplies of the components:

Light source: 11.5V

Filter wheel motor: +12V

Chopping wheel motor: 6V

Amplifying board: ±12V

Heating/cooling device: 8V

2.4.1 Testing Light Source

Disconnect the power line of the light source and turn on the NB-201. Find Jumper +11.5V and Jumper LG on the main board and measure the voltage between the two points by a multi-meter. Adjust switch W201 on the main board until the reading on the multi-meter becomes 11.5V. Connect the power line of the light source and turn on the light. Measure again the voltage between Jumper +11.5V and Jumper LG. Check if the multi-meter reading is stable, and if not, adjust again switch W201 to stabilize the reading between 11.5±0.2V, thus to ensure proper operation of the light source circuit.

2.4.2 Positioning Filter Wheel

After replacing the filters, access the “Zero drift check” screen to see if the filter wheel rotates and the 340nm filter is positioned to the center of the optical path. If not, adjust the filter wheel positioner to eliminate the deviation. Then access the

"Filter Check" screen to check the positions of the remaining filters.

2.4.3 Amplifying Board

Follow the steps given below to replace the amplifying board.

1. Turn off the analyzer and disconnect the amplifying board from the main board. Adjust switch W102 on the main board to set the voltage between Pin 7 of Chip U105 and Jumper AGND (both on the main board) within the range of 0～0.02 mv.
2. Re-connect the amplifying board to the main board. Access the "Filter Check" screen to check the obtained absorbance. Adjust switch W103 on the main board to set this value around 0.1 and below 0.200.

2.5 Printing Part

The printing part consists of a driving part and a thermal printer, as Figure 2-5 shows.

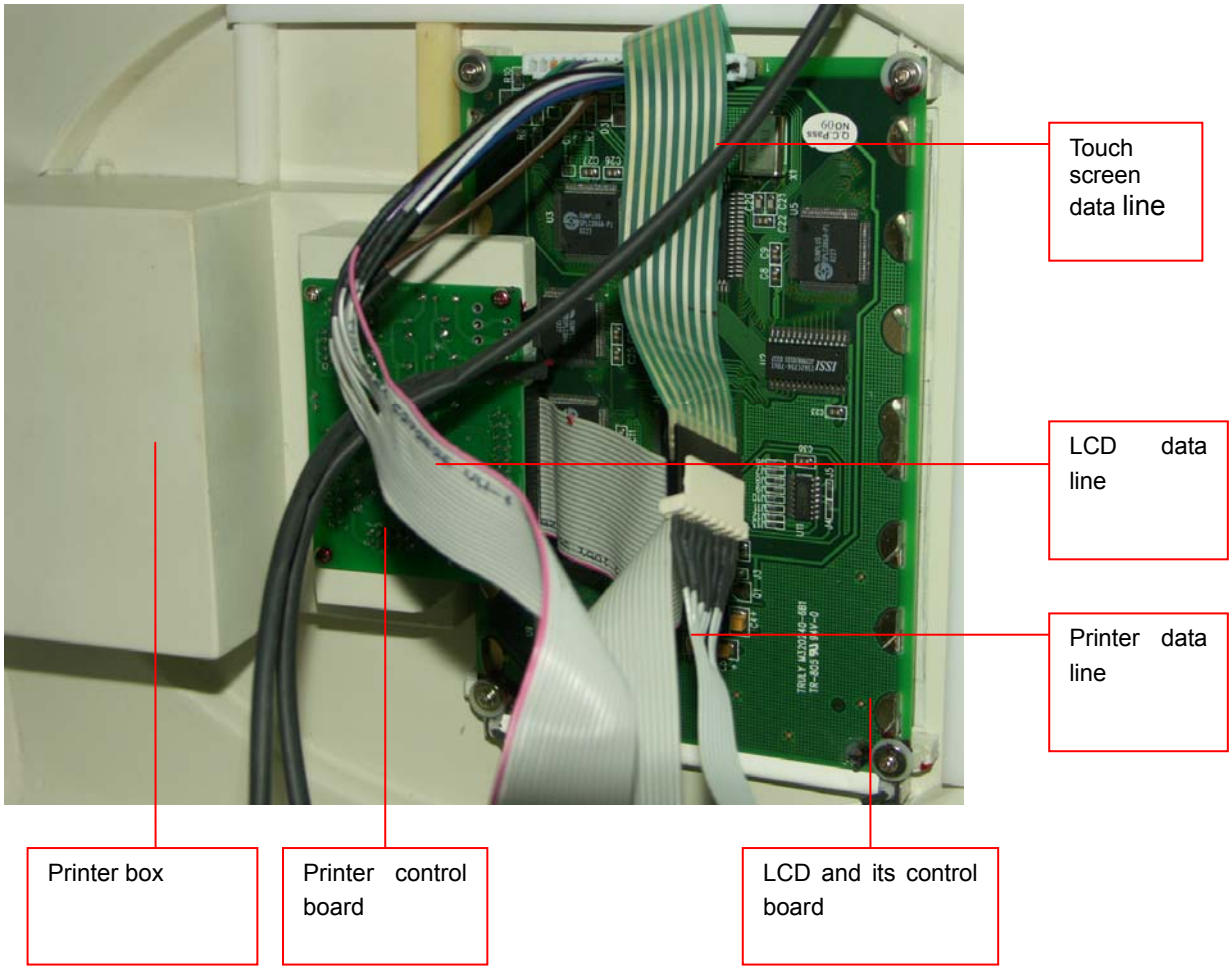

Figure 2-5 Positions of Printer and LCD

1. The printer control board is fixed by 4 screws and can be dismounted by removing them. The core of the printer is connected to the printer control board by the data line shown in Figure 2-5. Be sure to gently disconnect the data line when dismounting the printer control board.
2. The core of the printer is fixed by a screw.

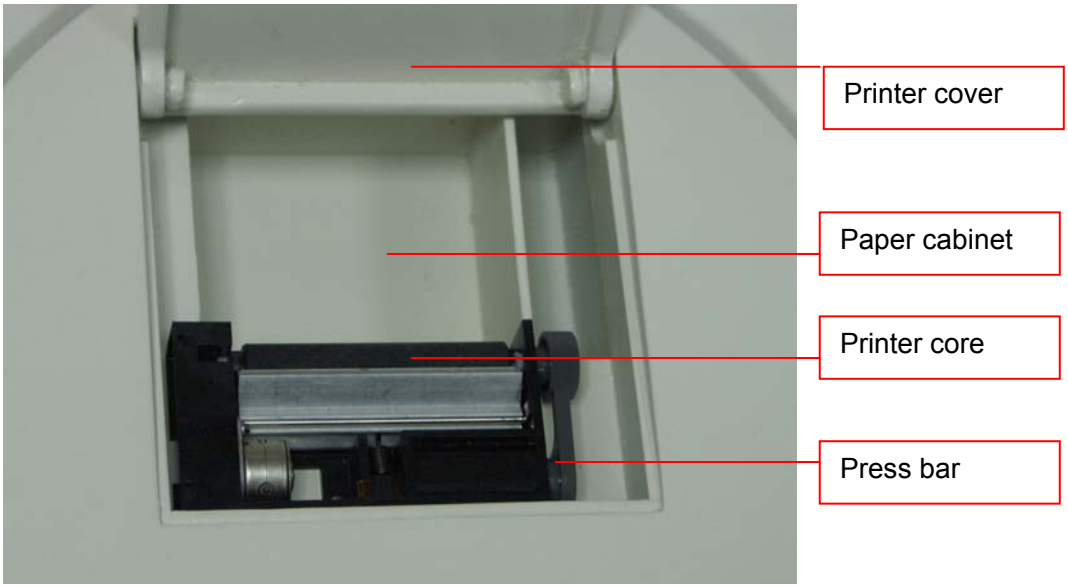

Figure 2-6 Front View of Printer

2.6 Motors

1. Peristaltic pump motor，powered by a +12v supply. See Figure 2-7.

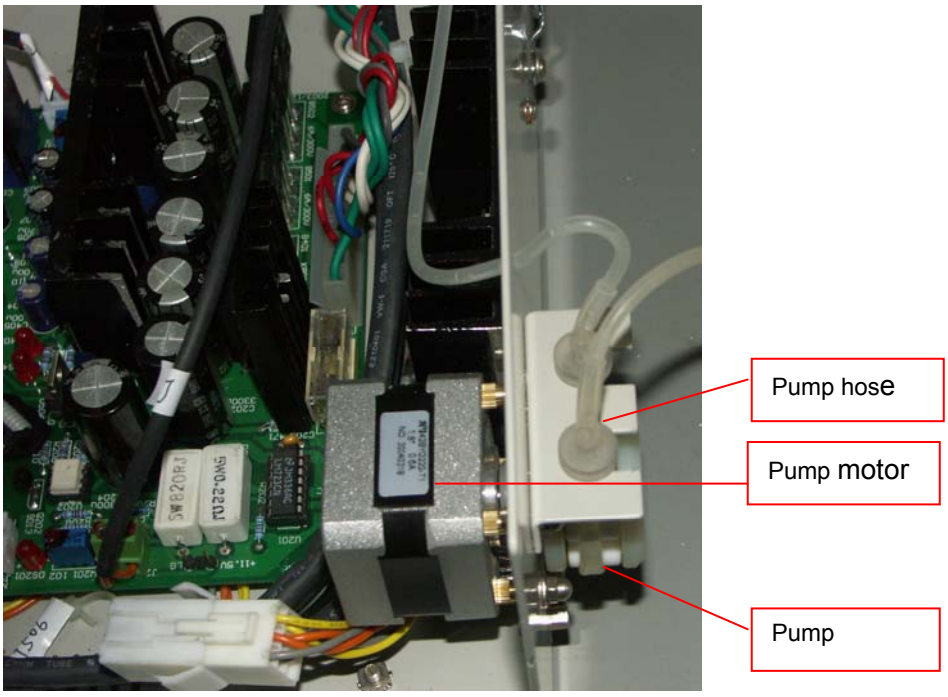

Figure 2-7 Position of Peristaltic Pump Motor

2. Filter wheel motor, powered by a 12V supply.

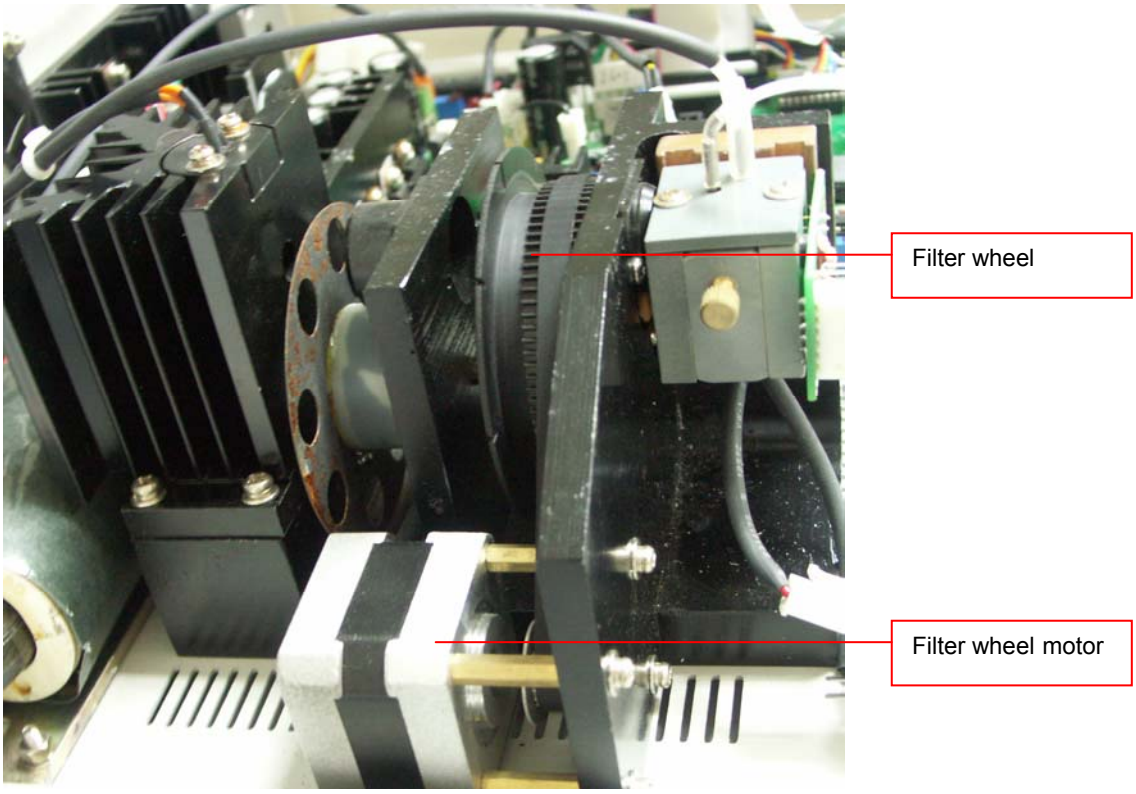

Figure 2-8 Filter Wheel Motor

Chapter 3 Problem Analysis

3.1 Problem Analysis

<table>
<tr><td rowspan="3">Item</td><td rowspan="3">Problem</td><td colspan="5">Analysis</td></tr>
<tr><td colspan="2">Kinetic</td><td colspan="2">Fixed Time</td><td>End Point</td></tr>
<tr><td>Positive reaction</td><td>Negative reaction</td><td>Positive reaction Cr</td><td>Negative reaction BUN</td><td></td></tr>
<tr><td>1</td><td>Absorbance obtained in the “Zero” mode is less than that in the “Filter Check” mode.</td><td colspan="5">It implies
① bubbles were present during the filter check;
② absorbance dropped after flow cell cleaning.</td></tr>
<tr><td>2</td><td>Absorbance obtained in the “Zero” mode is greater than that in the “Filter Check” mode.</td><td colspan="5">It implies
①bubbles entered the flow cell；
②the flow cell is dirty and needs cleaning.</td></tr>
<tr><td>3</td><td>In the “reagent blank” mode, the analyzer gives alarm for too low absorbance.</td><td colspan="4">Reagent blank mode is not applicable in this mode.</td><td>It implies the existing bubbles are being excluded.</td></tr>
<tr><td>4</td><td>In the “reagent blank” mode, the analyzer gives alarm for too low absorbance.</td><td colspan="4">Reagent blank mode is not applicable in this mode.</td><td>It implies
① bubbles entered the system.
② Reagents are expired.</td></tr>
<tr><td>5</td><td>The new K value obtained in standardization is less than the old one.</td><td colspan="2">No analysis.</td><td>① problem with standard
②problem with aspiration
③bubbles</td><td>Possible
①problem with standard
②problem with aspiration</td><td>①problem with standard
②problem with aspiration
③bubbles</td></tr>
</table>

6	The new K value obtained in standardization is greater than the old one.	No analysis.		①problem with standard ②problem with aspiration	①problem with standard ②problem with aspiration ③bubbles	①problem with standard ②problem with aspiration
7	QC results exceeds the target.	Problems with ① controls ② aspiration ③parameter settings		Possible problems with ① controls ② aspiration ③value of K		
8	When measuring, the analyzer gives alarm for too small absorbance.	①bubbles ②problem with aspiration ③problem with sample	Expired reagents	①bubbles ②problem with aspiration ③problem with sample	Expired reagents	① bubbles ②problem with sample and aspiration ③ incorrect reaction time
9	During measurement, the analyzer gives alarm for too large absorbance.	Expired reagents	① bubbles ②problem with aspiration and operation	Expired reagents	①bubbles ② problem with aspiration and operation	Expired reagents
10	Negative concentration value is obtained.	① wrong parameter settings； ②bubbles；③problem with the analyzer				① bubbles ②problem with the analyzer
11	Concentration exceeds reference value.	①problem with sample； ② problem with aspiration and operation；③bubbles； ④ excessive reaction time				
12	Concentration exceeds analysis range.	①sample needs to be diluted； ② inappropriate aspiration and operation；③ bubbles				
13	Concentration exceeds absorbance limit.	①sample needs to be diluted； ② inappropriate aspiration and operation；③ problem with analyzer.				
14	Other problems.	No aspiration or too small aspiration——①too small aspiration volume；②flow cell or tubing blocked or leaking Concentration or curve not displayed —— ①measurement not finished yet；② analyzer not responding Analyzer does not respond to touch screen operations ——①last test not finished yet；② analyzer not responding Cannot access measurement menu ——① wrong temperature setting or still heating；②program busy or in chaos；③ analyzer not responding.				

Chapter 4 Troubleshooting

4.1 Unstable Results

Check the following items if unstable results are observed:

1. Check whether the analyzer is powered by the demanded voltage; whether the analyzer is properly grounded; whether source of interference is present.
2. Check whether the absorbance of the flow cell increases and whether the aspiration volume decreases. Check against the table below to solve problems regarding the flow cell.

Problem	Cause	Solution
Flow cell is dirty.	Cleaning not frequent enough or not thorough enough.	Soaking the flow cell with cleanser.
Flow cell leaks.	Bad flow cell quality or poor maintenance.	Replacing the flow cell.
Flow cell is clogged.	Serums not good enough or cleaning not frequent enough..	Soaking or pressurized washing
Flow cell's capability to exclude bubbles decrease.	Aged pump hose causing slow flow and pollution.	Replacing pump hose.

Table 4-1 Flow Cell Problems

3. Check the tubing to see if any of the following problems exists.

A. Aged pump hose, clogged hole of the pump hose adaptor, sticky pump hose （loud noise）

B. Leaking or broken tubing.

C. Sampling probe broken, bended or staved (replacement demanded）.

4. Ill contacts in the circuitry.

4.2 Filter Positioning Check（absorbance at 340～630nm）

Check against the table below for problems regarding filter positioning:

Problem			Cause	Solution
Absorbance of certain filter increases			Filter covered by mildew, dust, or other foreign objects	Cleaning or replacing the filter.
For All Filters	Problem regarding light source		Aged lamp（excessive service time, decreased illumination, fog in lamp），or damaged lamp	Replacing the lamp.
	Problems regarding Lamp voltage（11.5V）		1. Lamp voltage keeps increasing and adjusting switch W201 does not work.. Lamp voltage is unstable, which may be caused by fluctuating power supply voltage. 2. Lamp voltage drops below11.0V 3. No lamp voltage, which may be caused by the broken fuse（fuse 723）.	1. Replacing TIP142 and 723. 2. Adding a stabilizer and adjusting switch W201 to set the voltage at 11.5V. 3. Replacing the fuse.
	Problem regarding chopping wheel		1.Rotation frequency is less than 350HZ or greater than 430HZ. 2. Chopping wheel does not rotate or becomes disconnected.（absorbance>3.0）	1. Adjusting switch W301 to 400HZ 2. Replacing the chopping wheel.
	Flow Cell	Small absorbance change	Polluted flow cell.	Cleaning flow cell.
		Large absorbance change	Leakage, blockage, difficulty to exclude bubbles（absorbance>0.7）	Checking, cleaning or replacing the flow cell.
		No aspiration	Disconnected window or leakage	Replacing the window
		High absorbance of filters 340 and 405.	Flow cell polluted（light source lamp aged）	Soaking the flow cell for temporary use.
	Negative absorbance（F8）		PCB U107-109 damaged	Replacing U107-109.
	Negative absorbance（F8 positive）		TIP142 damaged Too high voltage for light source lamp	Replacing TIP 142.
	Optical path	Decreased	Optical path changed. Lamp replaced. Flow cell inappropriately adjusted.	Adjusting the optical path or W101.
		Increased	Optical path changed. Lamp replaced. Flow cell inappropriately	Adjusting the optical path (adjusting W101 not recommended).

Table 4-2 Failure of Filter Positioning Check

4.3 Zero Drift Check

Failure of the check may result from the following factors:

1. Fluctuating power supply and/or interference;

2. Distilled water of poor quality;

3. Aged light source lamp, power supply of the lamp below <11.00V, and/or loose connection of lamp plug;

4. 340nm filter aged, or covered by dusts or mildew;

5. Flow cell dirty, leaking or difficult to exclude bubbles;

6. Degraded ambient conditions;

7. Refer to section 4.2 for other factors.

4.4 Problem Regarding Temperature Control

Excessive reaction time may result from the following factors:

1. Too high ambient temperature and/or poor ventilation;

2. Exhaust fan not working.

Chapter 5 Maintenance

5.1 Replacing Common Parts

5.1.1 Replacing Flow Cell

5.1.1.1 Dismounting existing flow cell

1. Disconnect the inlet and outlet hoses from the flow cell. Remove the flow cell cover and the shield cover beneath it.
2. Unscrew the fixing screws of the flow cell and take it out.

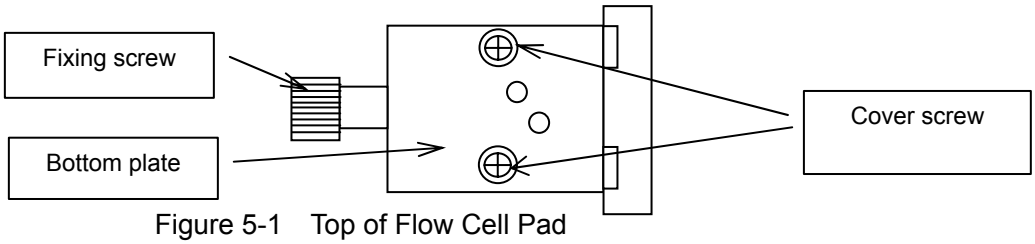

Figure 5-1 Top of Flow Cell Pad

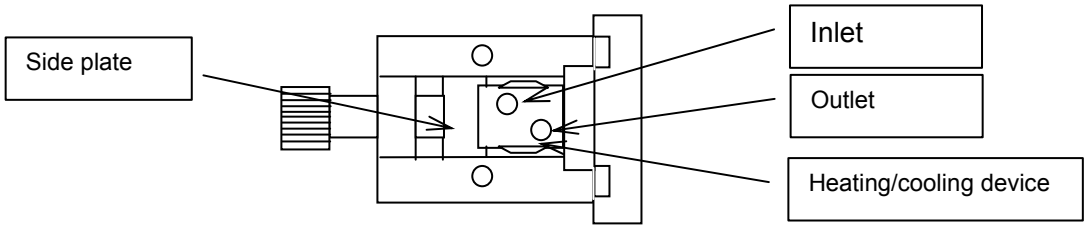

Figure 5-2 Top of Flow Cell Pad after Cover Is Removed

3. Unscrew the screw fixing AD590 (temperature probe) from the bottom of the flow cell.

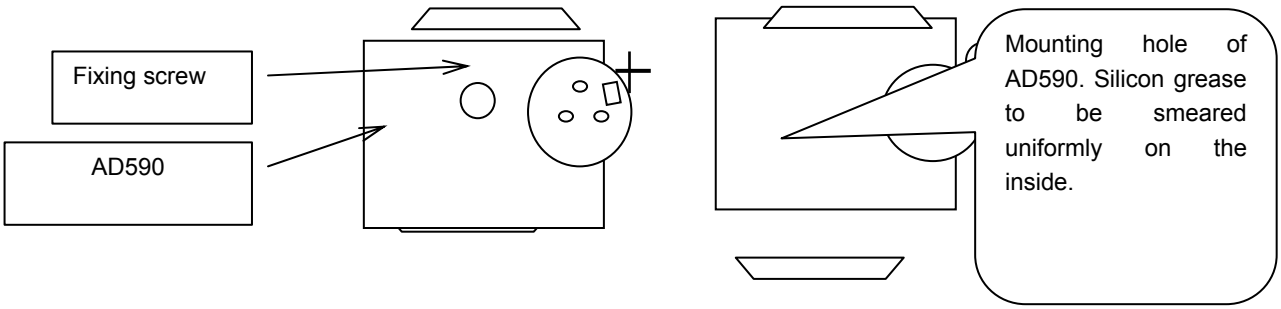

Figure 5-3 Flow Cell (Bottom）

5.1.1.2 Installing Flow Cell

1 Clean the surface, especially the quartz window of the flow cell, with soft paper (such as lens paper).

2 Uniformly smear silicon grease on the inside of the mounting hole of the temperature probe, as Figure 5-4 shows. Install the temperature probe and tighten the screw.

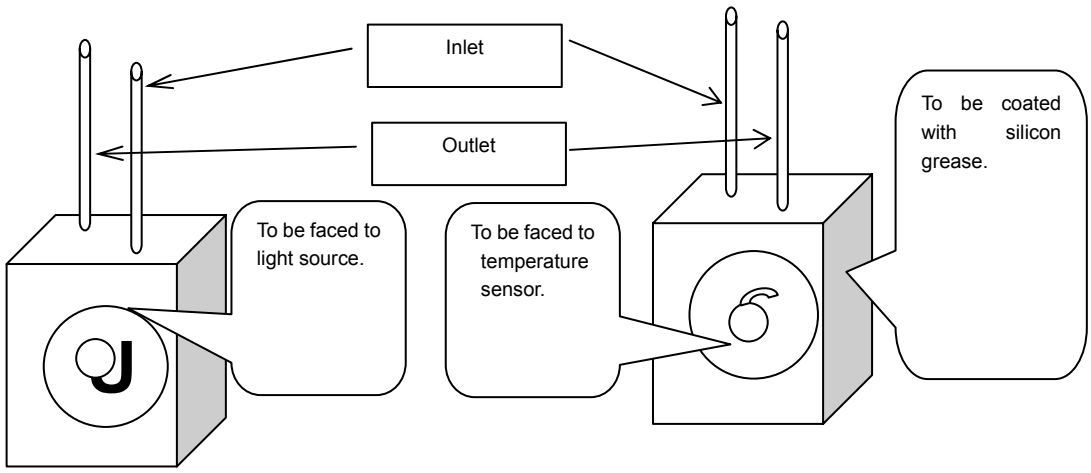

Figure 5-4 Schematic of positions of flow cell inlet and outlet

3. Coat the side of the flow cell to be in full contact with the heating/cooling device with silicon grease. Press the side plate to the other side of the flow cell and install them together to the flow cell pad. Slightly fix the side plate and the flow cell by tuning the fixing screw. From the flow cell top press the side plate and the flow cell all the way down to the bottom, and completely tighten the fixing screw.
4. Place the blind on the flow cell, replace the flow cell cover and completely tighten the screw on the cover.
5. Insert the inlet hose and outlet hose respectively into the inlet and outlet of the flow cell.

5.1.1.3 Note:

1. Be sure to install the flow cell in the right direction. If reversed, the flow cell will have difficulty to exclude bubbles.
2. Be sure to smear silicon grease sufficiently and uniformly on the specified places. Otherwise, the temperature of the flow cell cannot be properly controlled. Be sure to keep the surface of the quartz window and that of the photo cells free of silicon grease.
3. When removing the inlet or outlet hose, be sure to firmly grasp the bottom of the hose and then pull it upward. Don't try to pull the hose by grasping its top, otherwise the hose may be deformed or broken. It is also feasible to use tweezers to pry the hose from its bottom.
4. When inserting the inlet or outlet hose, be sure to focus your strength in the vertical direction to insert the hose into the inlet or outlet by 3mm. Should your strength be dispersed or inclined, the inside of the hose may be scratched and the particles resulting from the scratch may block the flow cell. If the hose is seriously damaged by this reckless maneuver, gas leakage will arise during the operation of the analyzer.
5. Before installing the temperature probe（AD590）, be sure to first lead the probe through the hole shown in Figure 5-5.
6. After the replacement of the flow cell, the filter check may find the absorbance changed. Adjust rheostatW101 o set the each filter absorbance in the range of

0.050~0.200.

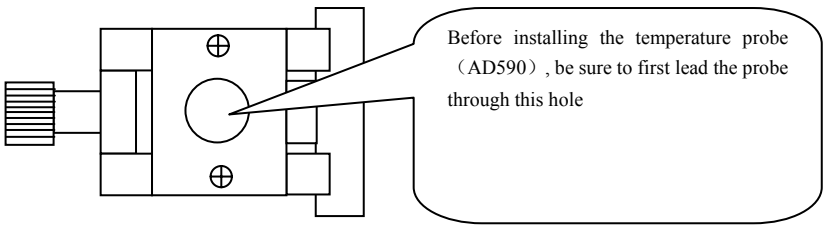

Figure 5-5 Flow Cell Pad（bottom）

5.1.2 Replacing Light Source Lamp

After the replacement of the light source lamp, it is usually necessary to adjust the optical path, clean the bubble of the lamp and tighten the fixing screw. Adjust switch W201 to set the power supply to the lamp at11.5V. Clean the flow cell repeatedly to make sure no bubbles exist. Align the light spot, first horizontally（left and right）then vertically (up and down), to the center of the 340nm filter（007）. If the filament is too high, insert some gaskets under the bottom of the radiator. If the filament is too low, file the lamp bottom or the radiator bottom accordingly. Adjusting the radiator (lamp), moving the flow cell forth and back, or moving the photoelectrical PCB up and down can minimize the absorbance, which can then be adjusted as required by tuning switch W101.

5.1.3 Replacing Filters

Use tweezers to replace the filters. Be sure the filters are not covered by dusts or water. In case of absorbance fluctuation after the replacement, adjust or replace the corresponding attenuation filters.

5.1.4 Replacing Main Board

After the replacement, adjust:

1. Switch W201 to set the light source voltage to 11.5V;
2. Switch W501 to set the rotation rate of the chopping wheel to 400Hz;
3. Switch W601 (first pull the J602 plug) to set the voltage between pin S5 and pin AGND to（X-0.3060）×7(note: X is the value marked on the AD590 connector). Enter the screen of any test requiring the 37℃ measurement to check whether the displayed temperature is stabilized between 37℃±0.04.

5.1.5 Replacing Heating/Cooling Device

Be sure the heating/cooling device is installed in the right direction, with the red line facing yourself. Otherwise, the heating is done reversely. In that case, interchanging the blue and whites wires will solve the problem.

5.1.6 Replacing AD590

Be sure to add some silicon grease and adjust the W601.

5.2 Daily Maintenance

1. Clean the flow cell in time. Clear the end of the inlet tubing of any foreign object.
2. Clean the flow cell regularly to prevent increased absorbance caused by dirty flow cell. Soak the flow cell with the cleanser for a period no more than 10 minutes, and then flush the flow cell with distilled water.
3. Check the connectors of the flow system regularly. Clean the peristaltic pump and its hose. If the analyzer is not to be used for a long time, first empty the tubing and then loose the pump hose.
4. Frequently clear the place around and the bottom of the analyzer of water, dust and foreign objects.
5. Fill the flow cell full with water and immerse the entry of the inlet hose into the water.
6. Cover the analyzer after it has cooled down.
7. Turn on and off the analyzer as instructed by the operation manual. Be sure all the switches are clean.
8. When replacing the components inside the analyzer, after opening the casing, be sure to clear the inside of dusts and other foreign objects, add a dash of oil to the rotating parts, check the fixtures and adjust the analyzer to its best performance.

Chapter 6 Notes

6.1 Reagents and Sample

1. Be sure to check the reagent's production date and expiration date; check whether the reagent is damaged or expired; check whether standard and operation instruction is supplied;
2. Be sure to read and comprehend the instruction sheet of the reagent and to enter the correct parameters;
3. The sample or regent should be formulated as instructed. Be sure to prevent pollution during the process;
4. Be sure to check whether the sample is expired;
5. Be sure to properly adjust the reagent-to-sample ratio;
6. To avoid bubbles, be sure to start the measurement immediately after the reagent and the sample are well mixed;
7. After taking the sample or the reagent from the refrigerator, be sure to start the measurement after its temperature increases to the required value.

6.2 Aspiration Notes

1. Be sure the sample probe's accuracy and smooth.
2. Be sure to clean the sample probe of any sticky fluid;
3. Be sure to well mix the sample or standard at the bottom of the cuvette.
8. Be sure to clean the scale in time and observe the scale at an appropriate angle.

6.3 Operation Notes

1. Be sure not to measure when the reaction time is too long or too short;
2. Be sure not to measure when the sample and the reagent is not completely mixed or when bubbles are present during mixing;
3. Be sure to present the cuvette or tube to the sample probe at an appropriate angle for aspiration. Otherwise bubbles may enter the flow cell;
4. Enter proper menu to aspirate the corresponding reagents;
5. Be sure not mix samples or sample IDs;
6. Be sure to observe the absorbance indication in the "Zero" mode. Do not proceed with standardization or measurement when bubbles are present in the flow cell;
7. Be sure to perform reagent blank check regularly. Proceed with standardization or measurement only after you are sure the regent is not expired or polluted.
8. For the end point, reagent blank check must be done before standardization or measuring.
9. Be sure to check the sample first. For special samples, sample blank check must be done before measuring.
10. Be sure to check the new K against the old after standardization.
11. After a test, rinse the system before proceeding to the next one.

12. When finding bubbles, be sure to rinse the system before measurement.
13. After entering the measurement screen, be sure to check the parameters, method, temperature, wave length before starting the measurement.
14. After entering the measurement screen, be sure to finish the measurement and return to the main menu as soon as possible. Long time wait may cause the analyzer to stop responding.
15. Be sure to re-measure and analyze the sample of excessive reaction time.
16. Be sure to backup data, clean work table and service the analyzer after measuring.

6 .4 System Notes

1. Be sure the power supply meets the analyzer's power requirements. Install a voltage regulator or USP as necessary. Otherwise, the measurement results may be unstable or the system may not respond.
2. Be sure not to expose the analyzer to direct sun. Be sure the ambient is well ventilated. Cover the analyzer with a dust cover as necessary.
3. To prolong the service life of the light source lamp, after turning off the lamp, be sure to wait at least 10 minutes before turning it on again. Otherwise, the measurement results may be unstable. After turning on the lamp, be sure to wait at least 5 minutes before turning it off. Do not turn on/off the lamp too frequently.
4. During measurement, be sue the sample probe is inserted to the bottom of the cuvette or tube. Otherwise, bubbles may be aspirated into the flow cell.
5. Be sure not to wait too long at the sub-menus. Return to the main menu to wait for such operations as inputting assay sheet, measurement and inquires. Particularly, when entering the measurement after heating, long time wait will lead to command error and system not responding.
6. Changing assay sheet after the measurement is over or partially over may lead to data loss. Be sure to record the data before making changes.
7. For the multipoint standardization, be sure to enter 0.1 or 0.001, as opposed to 0, for the first standard concentration. Otherwise, the analyzer cannot be standardized. In case the standard of 0 concentration is needed, agent blanking will do.
8. Be sure to check filter positioning after daily startup. Check the positioning every week will help prevent bubbles from entering the flow cell.
9. After every test, be sure to rinse the flow cell with distilled water, best with dedicated washing reagent. Fill the flow cell full with water after using the analyzer. In case the analyzer is not to be used for a long time, be sure to empty the flow cell and loose the pump hose.
10. Be sure to check the aspiration volume every week or regularly.
11. When changing reagents or using reagents of other types, be sure to do the reagent blank check, re-calibrate the analyzer or adjust the K value.
12. Be sure to watch the aspiration volume during the aspirating process. Re-aspirate if too much was aspirated. Be sure to always clean the probe after

every aspiration.

13. Be sure to protect the operator from the sample, reagents or waste. If possible, disinfect the analyzer everyday.
14. The user is obligated to discharge the waste in compliance with the national or local regulations.

Appendix Circuit Diagram