DIRECTROY

Chapter 1 YH1800 Urine Analyzer Introduction

1.1 Summary of Urine Analyzer

YH - 1800 fully automated urine analyzer is with medical instrument co., LTD. Shandong yao hua 10 a, 11 a, 12, 13 a, 14 a special a urine analysis dipsticks are supporting the use of in vitro diagnostic medical devices.Instrument according to the dipsticks reagent area and reaction of biochemical components in urine samples color change, quantitative or semi-quantitative detection of white blood cells in urine samples, nitrite, uric bravery, protein, ph, occult blood, specific gravity, ketone body, bilirubin, glucose, ascorbic acid, calcium, creatinine, trace albumin and other ingredients, using refraction method test, turbidity was tested with scattering method, use color analyzer test.(the proportion of YH - 1800 fully automated urine analyzer, turbidity and color analyzer for options).

YH - 1800 instrument adopts high brightness four wavelength testing technology cold light source, ambient light interference resistance, long service life, improve the instruments accuracy, sensitivity, specificity, stability, and revised the ambient light, ph, hematuria, and abnormal color sample on the result of inspection;Automatic sample conveying, suction sample, sample points, cleaning, strip, put the test paper, waste paper collection, accurate quantitative samples, after each test a sample, the instrument for automatic cleaning, avoid the cross contamination between the test sample;With functions of emergency insert;Using LCD touch screen, convenient man-machine interaction, the built-in bar code readers, convenient management of the records;Apparatus by RS - 232 interface to realize two-way transmission and each unit circuit board upgrade, and can with laboratory information management system (LIS) and hospital management information system (HIS) connection.

In addition, YH - 1800 urine analyzer can also be connected with automatic urinary sediment analyzer through bridge of urine analysis workstation, detecting urine tangible components (such as cells, tube type, crystallization, etc.), sample transmitter can put six test tube rack, with inventory, back to close (optional), equipped with instruments in the process of the inventory, back to close after test the urine samples, sample

frame automatically recycling to recycle area, reduce the instrument when a large number of test samples is put and staff processing samples without problems in a timely manner.Instrument is used professionals in vitro diagnostic medical devices.

1.2 Technical Index

Test item(Taking the 14 items for example)

Leukocytes（LEU）	Nitrite（NIT）	Urobilinogen（UBG）
Protein（PRO）	pH（pH）	Blood（BLD）
Specific Gravity（SG）	Ketone（KET）	Bilirubin（BIL）
Glucose（GLU）	Ascorbic Acid（VC）	Calcium（CA）
Creatinine（CRE）	Microalbumin（MALB）	Turbidity (Turbidity)
Color (Color)		

The wavelength of homogeneous light :525nm、572nm、610nm、660nm

Test principle:Test strip :Albedometry

Specific gravity:Refraction method(matching hydrometer)

Turbidity:Scattering method

Color:RGB trichroism method

Test speed :240strips/hour

Test tube rack capacity :6 test tube rack(Accommodate 60 samples)

Sample volume :In vitro sample surface not less than the level of the test tube rack identification line

Suction sample size :Less than 2ml

Applicable strip :YH1800 dedicated urinalysis test strip

Data storage quantity :Conventional record 12000pcs

Emergency record 6000pcs

Quality control record 1000pcs

External output :RS232 serial interface, a parallel printer port

Display screen :8 inch colour touch screen

Working language :English/Chinese

Power supply:100-220V

Rate of work :120VA

Fuse wire specification :250V 2A

Using environment :Temperature 15℃—35℃,the best temperature 20℃ to 25℃,relative humidity 75% or less

Overall dimensions :Naked machine 475mm×698mm×584mm(length×width×height)

Sample conveyor 290mm×698mm×156mm(length×width×height)

Complete machine 695mm×698mm×584mm(length×width×height)

Weight :75KG

Printer :Built-in thermal printer

Transmission mode :Two way transmission

Transfer rate :9600bps、4800bps、1200bps、14400 bps

Note :YH1800 Urine Analyzer can be connected with bar code reader,to identyfy EAN-13, EAN-8, Code-39, Code-128, Code-93 code

1.3 Test Principle

1.3.1The Test Principle of Strip

YH-1800 Urine Analyzer uses photoelectric colorimeter principle, according to the color change on the test strip reagent zone and urine biochemical substances produced by the reaction, determine the content of biochemical components in the urine.

Instruments in four monochromatic light strip on the reagent area itemized scan, convert the scanned optical signal into an electrical signal, the electrical signal for A / D conversion, calculate the reflectivity of the reagent area. Instrument to determine the content of the urine biochemical substances according to the reflectance.Reflectance computation formula is as follows:

$$R = \frac{T_m \times C_r}{T_r \times C_m}$$

In it:

1.3.2 The Test Principle of Refractive Proportion

R—— Reflectivity

T_r —— Reflection intensity of test block to reference light

C_r —— Reflection intensity of blank block to reference light

T_m —— Reflection intensity of test block to determination light

C_m —— Reflection intensity of blank block to determination light

The light emitted from the light emitting diode into a beam of light through the gap and optical lens means light through a prism containing the urine tank then fired a receiving sensor, according to the refractive index of the prism grooves in urine specific gravity changes, so the receiving sensor associated angle of light is also changed.Calculating formula for refraction hydrometer method is

SGX=（SGH-SGL）（KX-KL）/（KH-KL）+SGL

In it:

SGX : The proporation of the sample solution

SGH ;The proporation of high concentration solution

SGL : The proporation of low concentration solution

KX :Position coefficient of the sample solution

KH :Position coefficient of high concentration solution

KL :Position coefficient of low concentration solution

The proportion of the sample solution changes as the temperature varies of urine specimens, a temperature difference of 3 ℃, specific gravity of 0.001 changes.

1.3.3 The Test Principle of Turbidity

The light emitted from the arc tube through the turbidity meter sample, and the incident was from the 45 ° direction detecting how much light is scattered by the sample particles, which scatter light measurement method is called scattering, urine turbidity is divided into "clear", "slightly turbid", "cloudy" and "severe cloudiness" three gradient.

Notes :"Clear" indicate:Test result is 0-400NTU;

"Slightly turbid" indicate:Test result is 600NTU-800NTU;

"Severe cloudiness" indicate:Test result is more than 800NTU.

Scattering method test turbidity formula is:

$$T=(SS/TS- SW/TW)/K$$

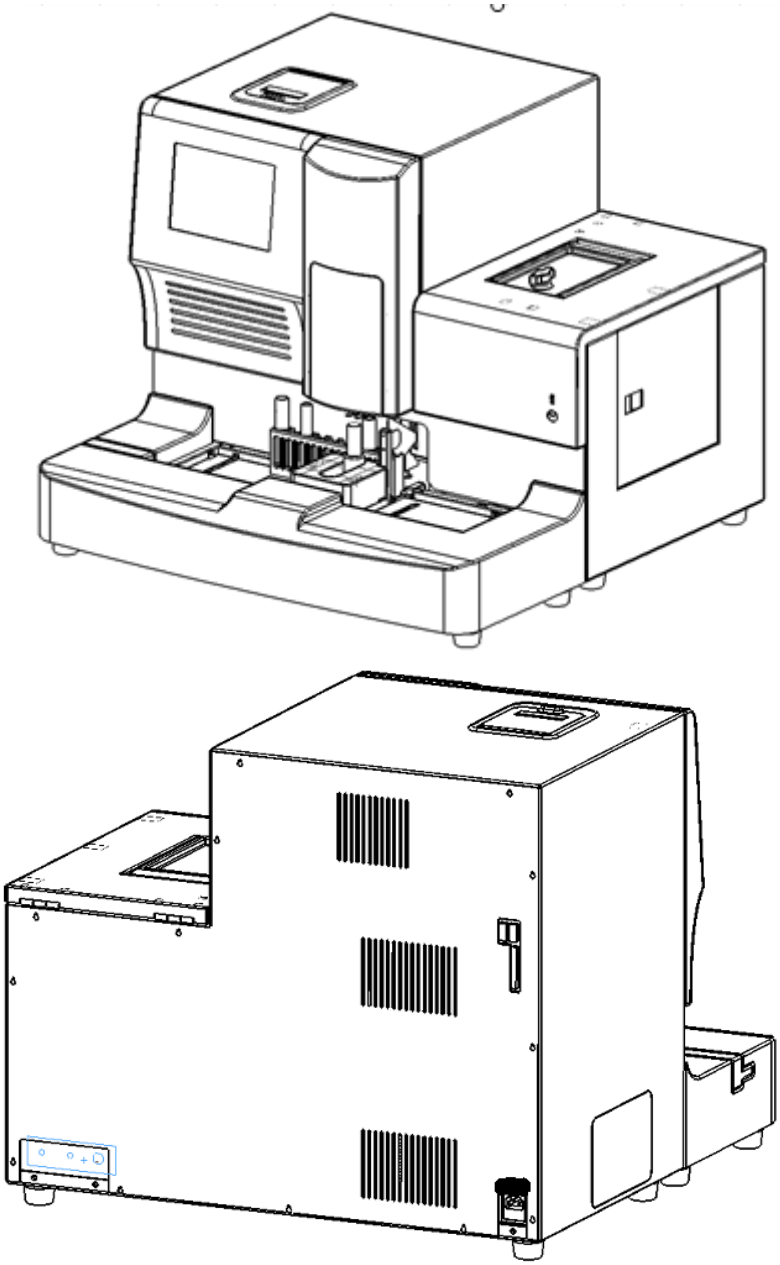
In it:

T ：	Turbidity level
SS：	Urine specimens scattering optical level
TS：	Urine specimens emission brightness rating
SW：	Cleaning fluid scattering optical level
TW：	Cleaning fluid emission brightness rating
K ：	Coefficient factor

1.3.4 The Test Principle of Color

Color using the RGB color sensor samples for testing by the white light-emitting diode to illuminate the sample, after transmission by the color sensor detect its R, G, B value, according to R, G, B is worth the sample color.

1.4 Structure



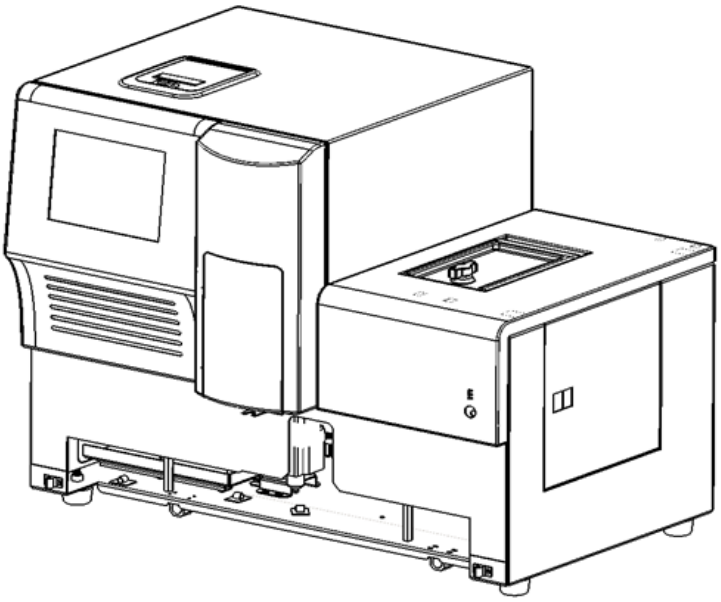
Picture 1-2 Instrument back veiw

1 LCD screen 2 emergency port 3 sample transmitter 4 built-in printer 5 test seal warehouse 6 power switch

7 Computer serial interface8 external computer serial interface parallel printer interface 9 fan 10 barrels cleaning fluid interface (WASH)

11 power cord receptacle 12 cleaning fluid level sensor interfaces 13 waste barrels (DRAIN) tapping 14 outer barcode reader interface

1.5 Identification



① 

Remind logo

●Non-professional users don’t open

② 

The power switch logo

● ON indicates that the power is open,OFF indicates that the power is off.

To avoid risks,to switch off the power before beginning o check the maintance.

③  Biohazard logo

●As the urine may have a potential infectious, please take protective measure in the test or when cleaning and maintenance of the instrument.

please process the urine sample and the abandoned strip according to the regulations of the local lab.

④  Warning logo

●In order to avoid injuries, please don't put the body near the instrument probe.

Chapter 2 YH1800 Urine Analyzer Installation

2.1 Instrument Installation Conditions

- Installation is recommended by the instrument engineer;
- such as self-installation, please read these instructions carefully and take appropriate measures;
- Place the instrument on a solid, flat table, do not put together with centrifuges and other vibration source;
- Do not place the instrument on place which may be affected by chemicals, corrosive gases or strong influence of electromagnetic interference;
- Do not place the instrument in direct sunlight, humidity or high temperatures;
- Before moving the instrument,it should be split into two parts, the host and the sample conveyor;
- Keep at least 20cm distance between the back of the instrument and the wall, make sure the instrument

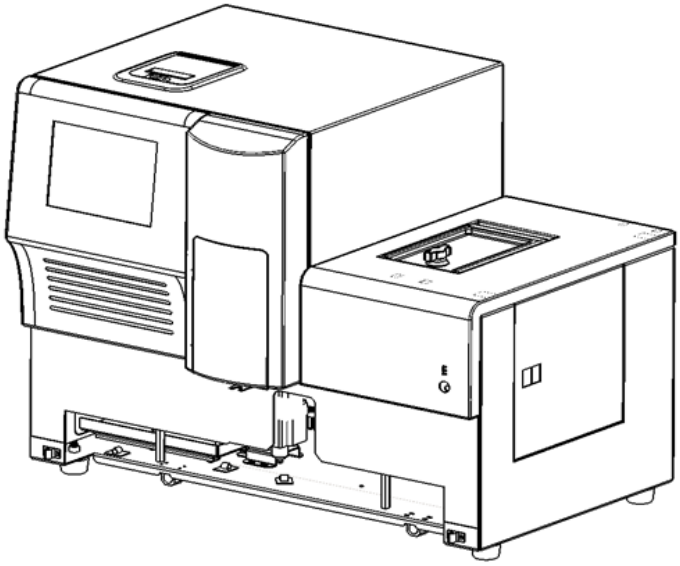
panel fan ventilation;

- Do not disassemble or modify the instrument;
- Do not place any bottles containing liquids in the top of the instrument to prevent tipping of the bottle of liquid leakage into the analyzer internal;
- instrument working environment temperature range of 15 ℃ ~ 35 ℃, the best temperature 20 ℃ to 25 ℃, relative humidity 75% or less.
- This equipment is in conformity with the provisions of this part of GB/T 18268 emission and immunity requirements.
- This equipment is according to GB 4824 class A equipment design and testing, in the family environment, the device can cause radio interference, need to take protective measures.
- It recommended to assess the electromagnetic environment before using the device.
- Prohibit the use of this equipment in a strong radiation source (for example, non-shielded RF source) side, it may interfere with the normal operation of equipment.

2.2 Unpacking

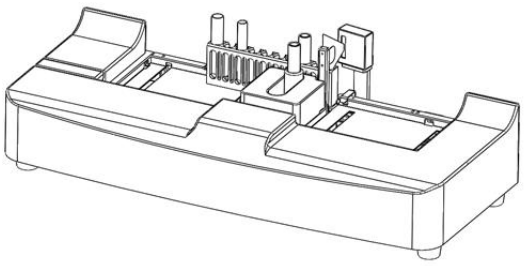
Respectively from four cases A, B, C, D, remove the YH - 1800 fully automated urine analyzer and attachments, and check the packing list, if any damage to the parts, please contact the supplier.

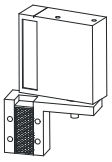
2.2.1 Items in packing case A

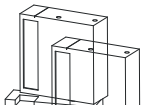


①Host machine pictur

2.2.2 Items in the packing case B





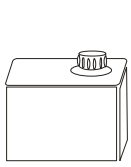


① ②

Picture 2-2

① Sample conveyor ② Barcode

2.2.3 Items in packing case C

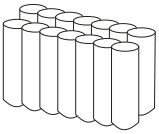




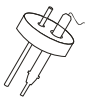
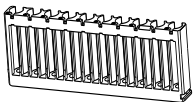
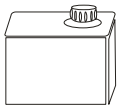
① ② ③ ④ ⑤





⑥ ⑦ ⑧ ⑨ ⑩ ⑪


⑫ ⑬ ⑭ ⑮ ⑯

①Waste liquor barrel ②Test strip ③Printer paper ④Calibration box（Equipped with one calibration strip）⑤Telecommunication cable

⑥fuse ⑦Brush ⑧Power line ⑨Screw ⑩CD ⑪Disposable plastic tube ⑫Cleaning fluid bottle cap component⑬Conventional test tube rack ⑭Cleaning fluid barrels ⑮Bar code reader ⑯User manual

Picture 2-3

2.2.4 Items in packing case D



①- ② ③ - ⑦ ⑧

Picture 2-4

①、②Concentrated cleaning fluid ③Calibration solution for proportion④Calibration solution for turbidity ⑤Turbidity quality control liquid

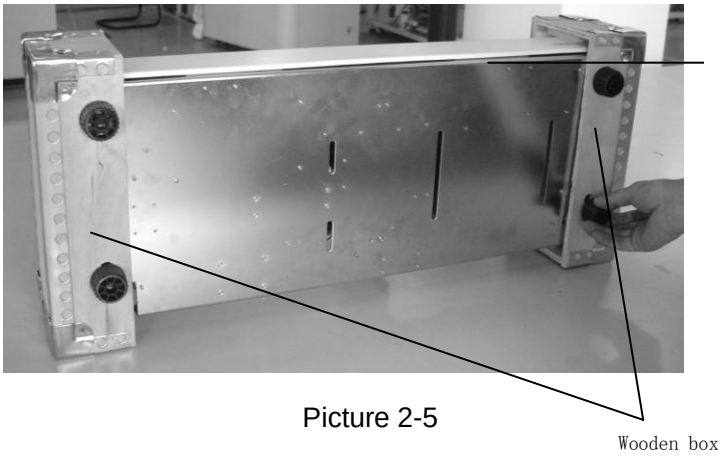
⑥Color quality control liquid ⑦Proportion quality control liquid ⑧Hydrometer, turbidimeter cleaning fluid

Note: If the instrument is not configured hydrometer, turbidity and color sensors, no ③,④,⑤,⑥,⑦,⑧ items in D box.

2.3 The Installation of The Instrument

2.3.1 The Installation of the samples conveyor

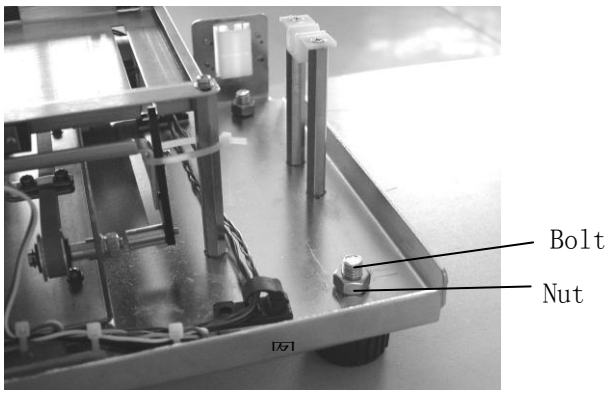
（1）Taking out the sample conveyor after unpacked, first remove the four feet mounted on the bottom of the wooden box, shown as picture 2-5:



Picture 2-5

（2）Get off the wooden box of the both sides,removed the shield plate of the sample conveyor(as shown in Figure 2-5,hold both sides of the plate then lift it upward)

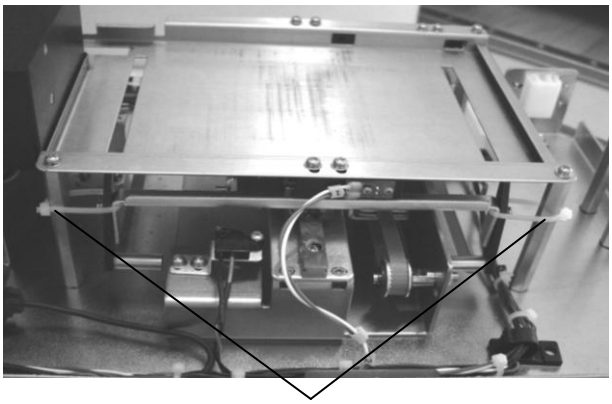
（3）Install foot bolt and tighten the nut in the bottom mounting holes,fixation,as shown in Figure 2-6:



Picture 2-6

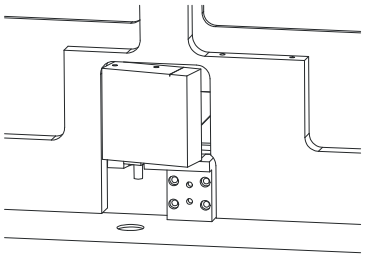
（4）Remove a nylon strap which fixed the mobile frame（as shown in picture 2-7）、two nylon straps which fixed the around frame(as shown in picture 2-8).

Picture 2-7



Picture 2-8

（5）Before use, fix the bar code reader component with four screws in position as shown in (picture 2-9)



Picture 2-9

（6）Put the sample conveyor right in front of the analyzer,insert the two plugs of the analyzer host into the corresponding socket of the sample conveyor,and close to the host by strict.

Notes:

After installed the sample conveyor,remove the ties between the sample extractor of host and pulling plate,then remove the ties between the belt in left side of the sample conveyor and wire holder,otherwise the instrument can’t run.

2.3.2 The connection of Waste Liquor Barrel and Cleaning Fluid Barrel

Before install the waste liquor pipe and cleaning fluid pipe,remove them from the back sheet firstly.

2.3.2.1 The connection of waste liquor barrel

The other end of the waste pipe directly installed on the random matching of waste liquid bottle caps, the length of the waste pipe inserted into the cap between 40 to 50 mm, then install the cap on the liquid barrel;The random waste pipe length is 2 m, if waste barrels are close to the instrument, can be cut a piece, not twines the waste pipe then insert into the waste barrel,to avoid the pipeline jam phenomenon,and put the waste barrel vertically on the ground.

2.3.2.2 The connection of cleaning fluid barrel

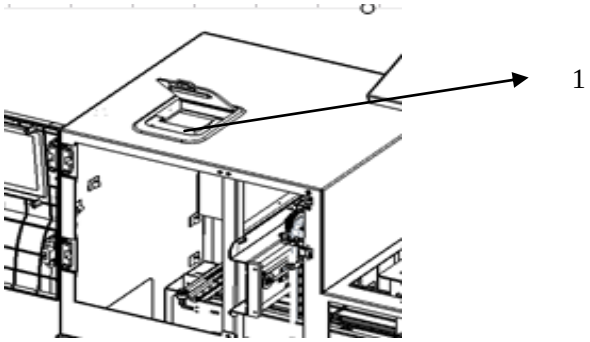
Before connecting the cleaning fluid barrels, firstly twist to it's cap,replaced with the random matching cleaning fluid cap component,then tight the cap;then connect the cleaning fluid pipe to the organic glass tube on the cover of the cleaning fluid barrel,the insert depth of should be 10-15mm.

2.3.3 The installation of the printer paper

Choose thermal printing paper with width of 57mm,diameter less than 45mm;

（2）Open the printer cover up;

（3）Place the paper into the printer cartridge; take down the roller 1,then placed the paper well before installing roller, cover printer cover, shown in picture 2-10.



Picture 2-10

2.3.4 The connection of the power line

Connect one end of the power line to ⑫，the other end connected to the hospital dedicated power supply,ensure the power supply reliable and grounding.

2.3.5 The connection of the computer

Instrument can be connected to a computer through the communication cable, to transmit data to the computer.Insert one end of the communication cable on the back of the instrument communication interface (⑦in Figure 1-1), the other end inserted into the mainframe computer serial interface.

2.3.6 The connection of dot matrix printer

Instrument can be connected to the dot matrix printer, output the test result by external dot matrix printer. Connect one end of the printer line to the printer and the other end into the back of the instrument external printer port (8 in Figure 1-2).

2.3.7 The installation of outer barcode reader

YH-1800 urine analyzer can be connected with the bar code reader ,scans the bar code on the sample tube. Remove the barcode reader from the box, as shown in Figure 2-11 Connect the bar code reader data cable, and connect the other end of the data line (RS-232 interface) with urine analyzer barcode reader interface (14 in picture 1 - 2)

Picture 2-11

Notes：

YH-1800 urine analyzer can be connected to EPSON LQ1600K series, EPSON LQ300K series dot matrix printer, PANASONIC1121 series dot matrix printer.

2.4 For the first time boot check

After the installation of the instrument,should make boot checking for the first time, if found problems during this process or display an error, please contact the supplier;

2.4.1 After open the power switch, the screen shows "system is in introspection...", the instrument start self-checking；

2.4.2 when the self-checking passed,the screen shows the main settings(picture 2-12);

Picture 2-12

2.4.3 The use of anti-counterfeiting paper barcode

In Figure 2-12 press “  ” button，the interface display as shown in picture 2 to 13;

Picture 2-13

Scanning or manual input effective bar code on the test strip's barrel,press" ok "key in picture 2-13 to confirm,instrument show "Enter a valid",then can be normal test.

In the process of input bar code, there is the following situations:

（a）Each barrel of barcode information on the test paper can be used only once, if input again, after press " ok " , instrument tip "has been used code";

（b）Manually enter, if the bar code input errors, after press " ok ", instrument tip "invalid code";

（c）If the strips inside the test paper barrel is not in the warranty period, the input of barcode information on the test paper strip, after press " ok ", instrument tip "date code".

注：

Bar code can be single input, also can be input in succession;

Enter an anti-counterfeiting barcode can test 120 strip,the number of test strips in the instrument main interface " " are displayed below the key, enter the bar code continuous cumulative increase in the number of test strips;

If the number below of the" " button shows 0000, the instrument cannot be tested again, must re-enter a new anti-counterfeiting barcode, can continue to test.

2.4.4 The usage of the off key :

Every day after test work is done,can press the button  in lower right corner of Figure 2-12,the screen display”is cleaning....”,the instrument automatically make pipeline cleaning, the screen displays "Switch off", then you can turn off the power.

2.4.5 Instrument use notice：

Test strip should be placed within the paper seal warehouse (in order to ensure the accuracy of the measured value, please put the rest test strip back in warehouse after work every day, then cover the barrel cap,test strip within the seal warehouse can be stored up to 24 hours);

(b) Put the test tube within samples in the test rack,then put the test tube rack on the samples conveyor；

(c) Press the button"sample test”,instrument automatically test after test,test end, built-in thermal machine automatic print test report;(in the process of instrument test don't touch any position on the touch screen, otherwise will lead to errors occur.)

(d) If the instrument does not appear as expected, or the printting results differ from expectations, please refer to the relevant settings.

Chapter 3 YH1800 Urine Analyzer Functions and Settings

3.1 Summary

YH - 1800 urine analyzer through the touch screen realization man-machine dialogue, relevant setting options and Settings displayed on the screen, the users only need to press the corresponding key can complete set operation.

Do not use hard or sharp object to operate the touch screen, so as not to damage the touch screen.

3.2 Keyboard description

Meanings of instrument function keys on the display as follows：

3.2.1 

Name: the return key

Function: make the screen to return to the previous settings.

Location: the lower right corner of the screen.

3.2.2 

Name: the main interface key

Function:back to the main screen from the current screen.

Location: down to the bottom of the screen.

3.2.3 

Name: the flip key

Function: make the screen to switch to the next settings

Location: the lower right corner of the screen.

3.2.4 

Name: the delete key

Function: delete the currently edited value, this key appear in the user can enter the number of the digital screen.

Location: in the numerical input interface.

3.2.5 

Name: the exit key

Function: to exit the current numerical editor interface, this key appear in the user can enter the number of the digital screen;

Location: in the numerical input interface.

3.2.6 

Name: the confirmation key

Function: to save the current edit values, the keys appear in the user to be able to enter the digital the digital screen;

Location: in the numerical input interface.

3.2.7 

Name: the cursor moves left key

Function: move the cursor to the left one, the keys appear in the user to be able to enter the digital the digital screen.

Location: in the numerical input interface.

3.2.8 

Name: the cursor moves left key

Function: move the cursor to the left one, the keys appear in the user to be able to enter the digital the digital screen.

Location: in the numerical input interface.

3.2.9 

Name: the number keys

Function: input the corresponding number.

3.2.10 

Name: print button

Function: through a thermal printer to print the current screen test records.

Location: record query interface.

3.2.11 

Name: delete the record key

Function: delete the current screen test records.

Location: record query interface.

3.2.12 

Name: stop button

Function: stop the current test.

3.2.13 

Name: the emergency key

Function: press this button, the liquid of emergency tube test.

3.2.14 

Name: the confirmation key

Function: to confirm the current selection, equivalent to a "yes".When performing some of the more important operations (such as save changes value), the instrument will prompt the user to confirm the changes.

3.2.15 

Name: cancel button

Function: to cancel the current operation, equivalent to a "no".This key and key in the same interface, click this button, the user canceled the selected operation.

3.3 Setting

3.3.1 Sample No.setting

According to the main interface (picture 2-12) "serial number" position, namely into the sample number son Settings interface (picture 3-1) :

Picture 3-1

Press numeric key input sample number;Press the confirmation key 

and return to the main interface (picture2-12), system application sets sample number;Press the return key 

to cancel the sample number changes and return to the main interface (picture 2-12), numbering system to retain the original sample.

Sample number is displayed on the screen on behalf of a number of the sample under test, each time after complete the strip test, sample number will automatically add 1.(note: do not include samples of emergency, emergency sample test Numbers alone).

Note: the sample number is set to 0;

Sample number up to 9999 four digits.

3.3.2 Date format setting

Press the main interface (picture 2-12) "set" button to enter the "Settings" interface (picture 3-2), enter the "flip  " into the next interface (picture 3-3), press the "date format" key, the screen display picture 3-4:

Through the  key, select date format.

Picture 3-2

Picture 3-3

Picture 3-4

●Change the time and date

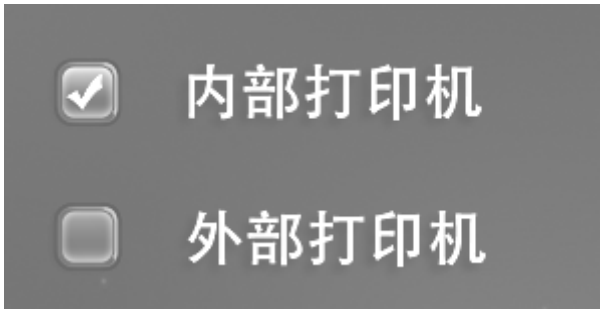
Press the date and time display area on the top right corner of the main interface.screen display as picture3-5

picture3-5

The upper of the screen shows the value input dialog box, enter the date minutes and seconds according date format . button ok to save the settings .button esc to exit the current settings, press ← delete entered value.

3.3.4 Setting Printer

Press the “printer”in the picture 3-2 show. ”Printer”select according the selection in the follow picture. You can select all, or all do not choose, or select an item.

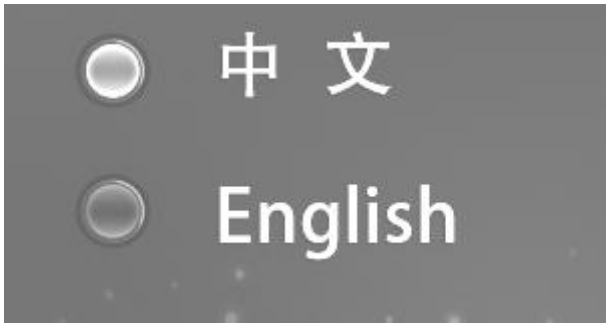


picture3-6

“Internal”represent the test result output by the instrument built-in thermal printer,”Outer” represent the test result output by the the out printer that connect with the machine.”do not select ”represent do not print the test result.。

3.3.5 Setting language

Press the”language”,chose Chinese or English



picture3-7

3.3.6 Setting the unit

Press the “Unit”The screen will display as picture3-8：

picture3-8

Press the  key，chose the corresponding units.

3.3.7 Symbol system

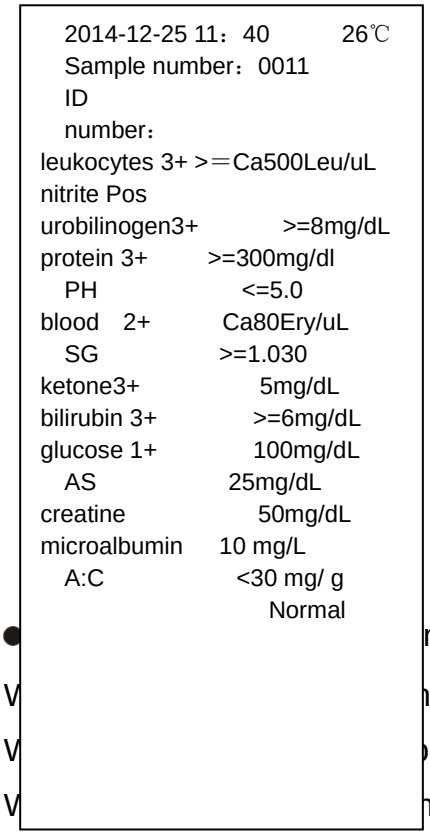
Press the”plus-minus”in picture3-8, Symbol system switch between the opening or closing.

- When the symbol system on “open”

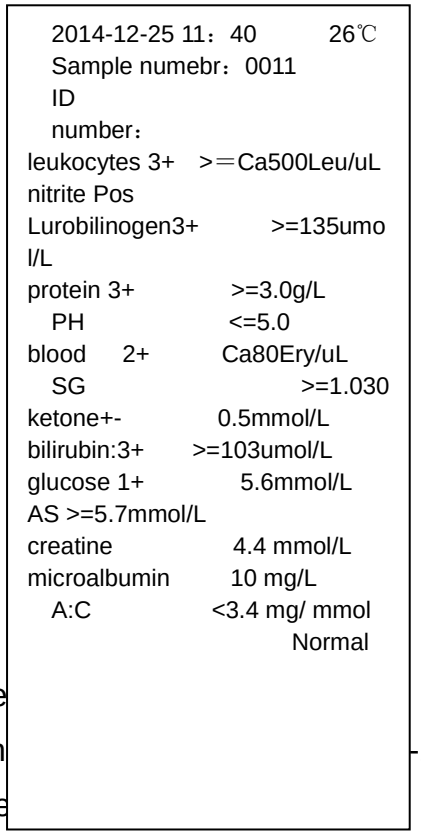
When Unit setting is normal,the print result as picture 3-9

When Unit setting is international,the print result as picture3-10

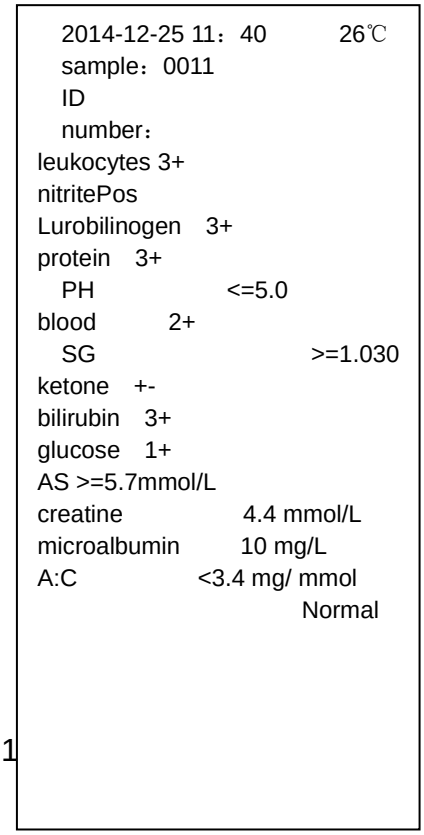
When Unit setting is symbol,the print result as picture3-11



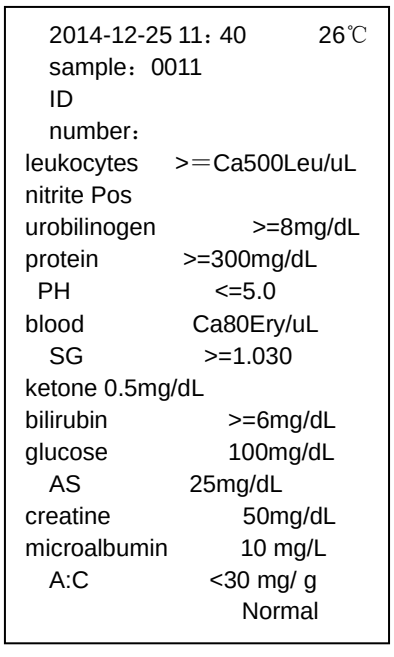
3-9



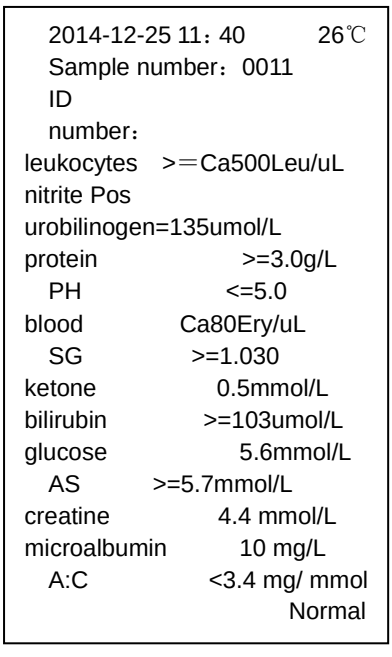
3-10



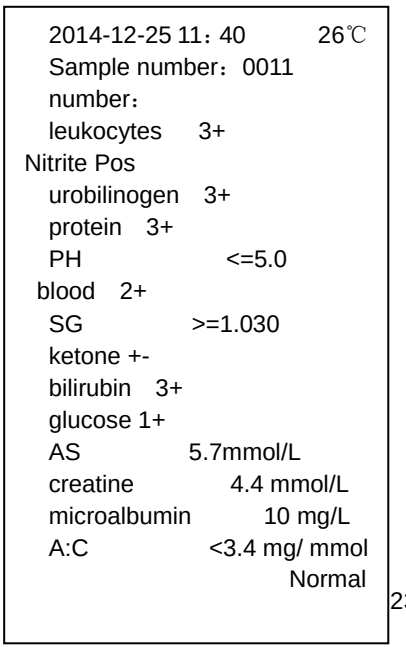
3-11



3-12



3-13



3-14

3.3.8 Setting outlier

Press the “outliers setting” button.entre the outliers setting interface,switch between open and close,“outliers mark-open” represent on the process of out putting the test result,when the test result reach or exceed the critical value setted by the user.this test result will be marked”*” “Outliers mark-close” even the test result reach or exceed the critical,the test result will not be marked ”*”.

Picture 3-15

3.3.9 Setting Critical value

Press the “Circle” button(take leukocytes as example)setting the leukocytes,nitrite,urobilinogen,protein,pH,blood,specific gravity,ketone,bilirubin,glucose, ascorbic acid.

	urobilinogen	,bilirubin	ketone	blood	protein	Nitrite	leukocytes	glucose
1	17μ mol/L	17μ	0.5mmol	Ca10Ery/	Trace	Pos	Ca15Leu/	5.6

		mol/L	/L	μ L			μ L	mmol/L
2	34μ mol/L	51μ mol/L	1.5mmol /L	Ca25Ery/ μ L	0.3g/L		Ca70Leu/ μ L	14 mmol/L
3	68μ mol/L	>=103 μ mol/L	3.9mmol /L	Ca80Ery/ μ L	1.0g/L		Ca125Le u/μ L	28 mmol/L
4	>=135μ mol/L		>=7.8m mol/L	>=Ca200E ry/μ L	>=3.0g/ L		>=Ca500 Leu/μ L	>=56mm ol/L

When the item test result reach or exceed the setting value in the picture3-15 or 3-16.when output the test result,this item will be mark “*’

If one item or more item test result reach or exceed the setting value in the picture 3-15 or 3-16,but the result do not mark”*”.then can change the Outliers mark-open to Outliers mark-close

3.3.10 Setting ID switch

Press the 

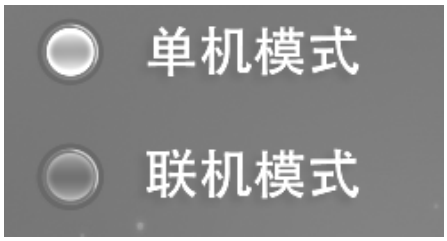
in the picture 3-3.the screen will display as picture 3-17

picture3-17

Press the OPEN OR CLOSE  key,The “ID”closed ,The test result printed with ID number, The “ID”open ,The test result do not printed with ID number as picture 3-9 to 3-13 show.

3.3.11 Setting up the test tube rack transport mode

Press the”Testing mode”key,Chose the test tube rack transport mode as the follow picture”



Picture 3-18

Standalone mode:Represent do not connect with other machine

On-lone mode:Represent the machine can connect with the urine sediment analyzer,and can transport the test result from urine analyzer to urine sediment analyzer

Notes:If do not connect the YH-1800 urine analyzer with the urine sediment analyzer,the analyzer set up in standalone mode in factory.if need change please contact with the factory.

3.3.12 Setting the baud rate

Press the”computer port”button.then select baud rate as the follow picture 3-19

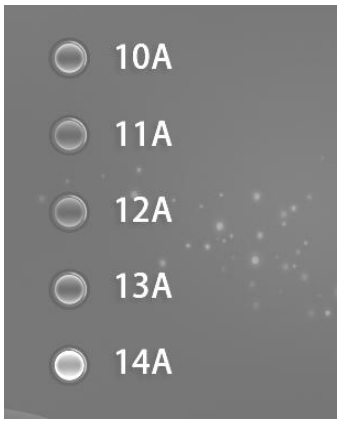
Picture 3-19

3.3.13 Setting the computer port

Press the computer port,then enter into the picture3-19,select open or close When the computer port on open,the analyzer can transport the data to the computer,when on closed,the analyzer will stop transport the data to the computer.

3.3.14 Chose the strip type

Press the strip button,the screen will display as follow picture



Picture 3-20

The manufacture will set up the strip type,if need change should authorized by the supplier

3.3.15 Reset

Press the advanced setting,when enter the advanced setting,the screen will display as picture3-21.Press the reset then the screen will display as picture3-22.

Picture 3-21

Picture 3-22

Press the “confirm” then the internal parameters of the instrument returned to the factory setting; press the “cancel” key to give up the change. After the user completes the settings to return to the main interface, the screen display as picture 3-23.

picture3-23

Press”confirm”key confirm,press“cancel”cancel

3.3.16

Setting the manufacture

Press the “manufacture”key,the screen display as follow：

Picture 3-24

The user can not set up the manufacture,when enter this interface press the esc exit and return to the higher level settings

Fourth Chapter

Checking Record and Clear

4.1 Checking the record

Press the “check the record” key in the main interface,the screen display

Picture 4-1

The user can check the quality control records, emergency records and sample records,and can clear the record.

4.1.1 Checking the sample record

Press “check the record”key()，enter the sample record interface as picture4-The screen display the current record.press the “  ” 、 “  ” can check the forward and backward record,press the “  ” print the current record,press the “  ” delete the current record.press the “  ” back the main interface.

●Checking the record according the sample number

Press number key the screen will display as picture 3-1:

Cursor stop in the first digit position, press the number key on the keyboard to enter the corresponding number, press the "OK" key to find the test sequence number record. If there is this record in the instrument, the screen shows the serial number of the test record. press the “  ” 、 “  ” can check the forward and backward record.Press the “  ” 、

“  ”check the forward and backward record with the same serial number. If there is this record in the instrument, the screen shows “no record”. press the。“  ” back the main interface（picture2-12）.

●Checking the record according the ID

Press the” ID：”the picture show4-2

picture4-2

Press the”ID：”the picture show4-2. Input the corresponding ID number then press“ 

”

If there is this record in the instrument, the screen shows this record. press the “  ” 、

“  ”can check the forward and backward record.Press the“  ”、“  ”can check the forward and backward record with the same serial number. If there is this record in the instrument, the screen shows no record. press the “  ” back the main interface(picture2-12).

●Checking the record according the date

Press the “date:” key in the picture 4-1,the screen display as picture3-1

Cursor to stop in the first digit position,Input the corresponding number, press the "OK" key to find the test sequence number record. If there is this record in the instrument, the screen shows this record. press the  and  ,can check the forward and backward

record.Press the  and  can check the forward and backward record with the same serial number. If there is this record in the instrument, the screen shows no record.

press the  back the main interface

4.1.2 Checking the quality control records

In the picture4-1,press the" quality control records" the screen will display the current record, press the  and  ,can check the forward and backward record, press the  print the current record,press the  delete the current record.press the  back the main interface/(picture2-12) If there is no quality control test results in the instrument, the screen display "empty record".Quality control record checking can also checking according the date and serial number, The method same with sample record way.

4.1.3 Checking the emergency records

Same as sample checking way 4.1.1

4.2 Clear the record

As picture 4-1 show.press the  the screen display as picture 4-3

picture4-3

Press" Cancel" store the record,press" confirm" clear the record

The Fifth Chapter
Quality Control and Calibration

5.1 Calibration strip

5.1.1 Preparation work

NOTE:

- Do not dip the calibration strip in water or other liquids;
- In the testing process, please ensure that the calibration strip does not deviate from the test position;
- Instrument random with 1 calibration strip
- Please contact the supplier if the calibration bar is dirty or damaged, do not continue using this calibration bar.
- In order to obtain correct test results, recommended every 1 to 2 weeks test the urine analyzer with calibration strip

5.1.2 Testing the calibration strip

Put the calibration strip in the strip container,then press the “testing the calibration strip” in the main interface,the screen will display” Testing calibration strip” when complete the printer will print the result automatically.

If the machine pass the calibration,the test result will be “Calibration OK”

If the machine do not pass the calibration,the test result will be “Calibration NOT OK”

5.2.1 The condition of test quality control

In order to ensure the accuracy of test results, in the following situations using Yaohua positive and negative urine analysis control liquid for monitoring quality control.

- When begin the test every day
- Replace new barre;
- Change operator
- When have doubt for the test result

5.2.1.1 prepare the test strip

There should be enough test paper strip in the seal chamber of the test paper.

5.2.1.2 prepare the quality control liquid

Prepare the quality control liquid according the instructions

Inject the quality control liquid into the test tube, The liquid level is not lower than the mark line of the test tube.

5.2.1.3

Put the test tube with quality control liquid on the test tube rack,then press the “quality control liquid test”in the picture2-12,the screen will display as picture5-1.then begin the test.

picture5-1

5.2.2 Specific Gravity quality control liquid test

In order to ensure the accuracy of the test results, Specific Gravity quality control liquid test – can arranged in the following condition:

-once a month

-When have doubt for the test result

5.2.2.1 prepare the quality control liquid

Prepare the quality control liquid accordind the instructions

Inject the quality control liquid into the test tube, The liquid level is not lower than the mark line of the test tube.

5.2.2.2

Press "gravity control liquid Test" button in picture5-1, print out the test after the end of the test, test results refer to the proportion of the control solution specification reference.

5.2.3 Turbidity control liquid test

Prepare control liquid as test method 5.2.2. The test cycle is generally a month, or if have doubt for the test results can arrange test at any time.

5.2.4 Color control liquid test

Prepare control liquid as test method 5.2.2. The test cycle is generally a month, or if have doubt for the test results can arrange test at any time.

5.3 Calibrated hydrometer

5.3.1 Preparation before calibrated

Prepare hydrometer liquid

High proportion of calibration liquid :Inject the 1.04 high proportion of calibration liquid into the first test tube.(the liquid level is not lower than the mark line of the test tube).

Low proportion of calibration liquid: Inject the distilled water in to the second tube(the liquid level is not lower than the mark line of the test tube).

Put the first test tube in the first location of the test tube rack,the second tube on the next.

5.3.2 Test the proportion of calibration

Press the “proportion of calibration” the screen will display as picture5-2

Picture 5-2

The screen will display low proportion of calibration1.0, high proportion of calibration 1.04,the screen display as picture5-2.(Input the high proportion of calibration value according the introduction,the user can modify it by press the high proportion of calibration if it is different from the introduction)after input the value,press the 

Instruments will calibrated hydrometer. After the calibration of the screen displays "Calibration Passed" or display"calibration failure"

Note:

Calibrated proportion once a month, if the calibration is still failed after two time.Clean the hydrometer in accordance with the method of operation and maintenance, If calibration is still not pass after cleaning, please contact your local supplier.

5.4 Calibrate Turbidimeter

5.4.1 Preparation before calibrated

(a)High turbidity calibration liquid :Inject the400NTU high proportion of calibration liquid into the first test tube.(the liquid level is not lower than the mark line of the test tube).

(b)Low turbidity calibration liquid: Inject the distilled water in to the second tube(the liquid

level is not lower than the mark line of the test tube).

(c)Put the first test tube in the first location of the test tube rack,the second tube on the next. And then put the test tube rack on load side.

5.4.2 Calibration of implementation

Press the “calibrated hydrometer” in the picture3-21,the screen will display as picture 5-3:

Picture 5-3

The screen will display the low turbidity calibration liquid is 0,the high turbidity calibration liquid is 400.picture display as 5-2.if the display value is different from the introduction the user can modify it by press the high turbidity calibration liquid.after input the value,press the 

, Instruments will calibrated turbidity. After the calibration of the screen displays "Calibration Passed" or display"calibration failure"

Note:

●If the instrument display alarm information "calibration turbidity meter", please calibrate according to the calibration process. If calibration fails to indicate calibration for the two time, please clean the turbidity meter in accordance with the method of operation and maintenance. If the calibration is still not passed, please contact the local supplier.

●If the turbidity is severe haze, color and the proportion of measured value will affected, at this time the measured value and the proportion of color values is only for reference. If the "exception value tag" option is "open", the test report is labeled "*" in front of the turbidity, and the color and specific gravity of the"!".

●If the instrument is not configured proportion, turbidity and color sensor, the quality control liquid testing liquid, turbidity liquid quality control testing, color quality control liquid test and the proportion of the meter calibration, turbidity meter calibration will do not need do.

Chapter VI **Routine Test**

Warning

- The volume of test sample：The liquid level in the test tube is not less than the mark of the test tube rack.
- Please don't test the distilled water, due to the low conductivity of distilled water, if test distilled water may cause the liquid level sensor does not detect instrument will alarm without sample.
- If the foam in the test sample is higher than 5mm, please do the test when the foam in sample precipitation below 5mm test.
- The operator should be far away from the position of the probe to avoid injury.
- Avoid testing viscous samples, to prevent blockage of the probe.
- If have the urine sample have blood，please put it in the last location of the test tube rack.After the instrument drawing that sample,please press the”stop”button.the instrument will clean automatically,then continue the normal test.
- The waste liquid tank should be placed on the ground, the waste pipe as far as possible with the vertical surface, to ensure the smooth flow of liquid waste.
- The operator can operate after the training.

6.1 Preparation before Testing

6.1.1 Urine test strip

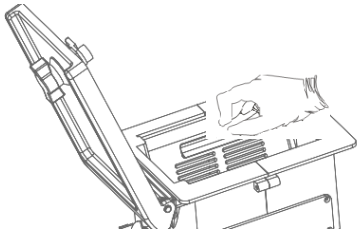
(a) Test strip can accommodate up to 200 of the maximum test strip, the test strip in the test strip in a sealed position can not be placed in more than 24 hours. In order to ensure the accuracy of test results, please replace the rest strip to the barrel after every day work .Please prepare the strip according the instrument set of test paper mode.

Note：In order to ensure the reliability of the test result.Please confirm the strip model .Test paper selection function requires special authorized by the supplier.

(b) Place the test paper strip: Open the test paper seal cover, place the test paper strip according test paper strip mark on the seal.

(c) Place the desiccant: Take out the desiccant from the barrel(2 bags per barrel).then put them in to sealed bin .

As picture 6-1 show:

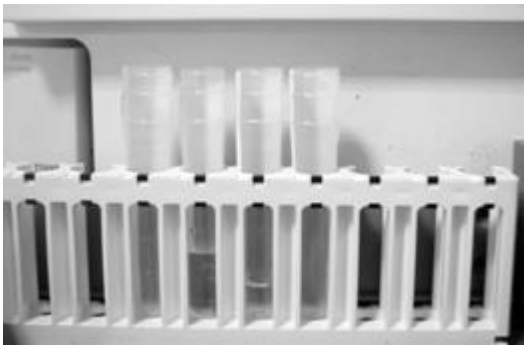


Picture6-1

6.1.2 Test tube request

(a) specification：DiameterΦ15mm，single-use PET tube that length is not more than 100mm，and insure tube height is not higher than the lower edge of the front door for the device on the left side.（As show in picture 6-2）。

(b) Test tube couldn’t have extrusion deformation.



picture 6-2

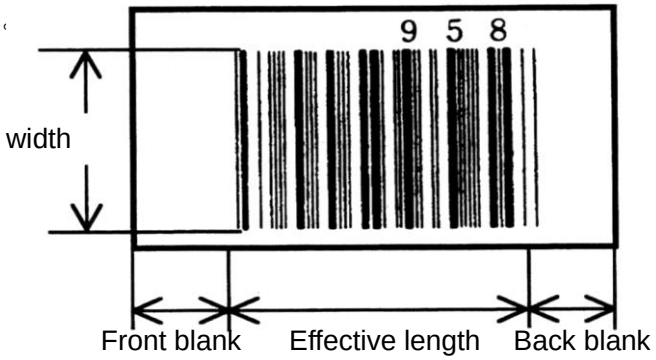
6.1.3 Bar code use request

(a) Bar code type：CODE128、CODE39、CODE93、CODEbar。

(b) Bar code label size：To avoid that the device can’t read the bar code when the tube revolve ,the printing width of bar code shouldn’t be less than 12mm.(As show in

picturer6-3）.The bar code numbers should not less than 4digits and not more than 15digits.

(c) When cut the bar code label the blank in the front and back should not less than 3mm（as show in picture 6-3）.



Picture 6-3

(d) Stick request for bar code label：

- The bar code label should be stuck smoothly.
- The bar code label shoudl be stuck on the correct location(The lower edge(including the front and back blank) couldn't lower than tick marks on the tube rack) to insure read the bar code correctly.As show in picture 6-4.And make sure that all the bar code labels can be seen from the longitudinal slot of the tube rack when the tubes are taken into the tube rack.
- When the bar code CODE39 is lowercase,after scanning what show on the screen and the ID No. on the printing report both are corresponding capital letter with "+" in the front;when we search the report,because there is no method to input "+",the report only can be searched via sample No. but not ID.

For example：ID No. Is 36Fa，after scanning the corresponding No. is 36F+A，"+" also take one digit.

Picture 6-4

6.1.4 Dispensing method of cleaning liquid(concentrated type)

Put the liquid in the concentrated cleaning liquid bottle into the 10L cleaning liquid barrel(as included) ,then use distilled water to wash cleaning liquid bottle and put the wash liquid into the 10L barrel,then put distilled water till arrive the tick mark on the 10L barrel,then well-mixed to use.

Noted: One barrel cleaning liquid can test 2800strips in continuous testing mode.

6.1.5 Inspect cleaning liquid barrel,waste barrel and thermal printer paper

(a) cleaning liquid barrel：put enough cleaning liquid in the barrel.

(b) waste barrel：setup the barrel correctly.

(c) thermal printer paper：open the printer cover and check if there are papers,if the paper shower change to pink,it means the paper will finish,please change one roll printing paper.

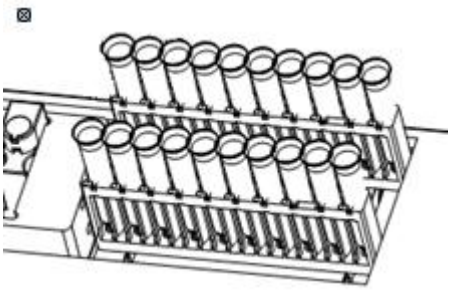
6.1.6 Urine samples

(a) Stick the bar code label on the test tube.（picture 6-4）。

(b) Quantity for urine sample in the tube:sample is not lower than tick mark of the tube rack.

(c) Put the test tube with urine sample on the tube rack and insert the tubes into the rubber base vertically.

(d) place tube rack：put the tube rack in the area under test of the sample transmitter,that is the right of emergency. As show in picture 6-5.



Picture 6-5

（e）Precautions of urine sample :

- Before testing,please mix the urine sample fully,but don’t test after centrifugation to avoid effect the sensitivity of the result.
- Use fresh urine sample.If the urine is not used for testing in one hour,please seal it and keep in cold storage.Samples must be returned to room temperature before testing.
- Do not add preservative, disinfectant or detergent.
- Urine sample should keep away from direct sunlight.

- If the urine sample contain AC,the test value of glucose may lower than the actual value.

6.2 TEST

After self-test,screen show main interface as picture 2-12,push the key”sample test” to start testing as picture 6-6.

Picture 6-6

To stop testing,push the STOP key as picture 6-6.

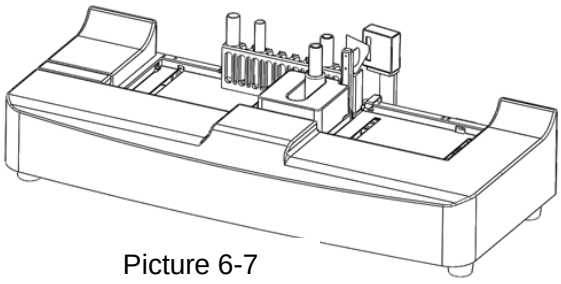
6.2.1 Conventional test operation

Take test rack on the sample transmitter,push the key “sample test” as picture 2-12,device transfer the tube rack automatically and test the samples in turn,then output inspection report.

6.2.2 Emergency test operation

Available to insert emergency test during conventional test,test method as below:

Take the urine sample into test tube,insert tube into emergency interface of sample transmitter,push emergency interface forward to the lock location(picture 6-7).



Picture 6-7

Push the key “emergency”（effective coverage  ） as picture 6-6,the screen show as

picture 6-8:

User can input serial number (emergency serial number is between 1--5000) or ID of emergency sample,also can choose operation for starting test or cancel test.

6.2.3 announcements for testing process

- **Do not pull back emergency interfaced directly to avoid damaging emergency interface.**
- **Do not remove tube rack to avoid confusing the test turns.**
- **Do not touch Suction sample needle with hands to avoid getting hurt.**
- **If the cleaning liquid is finished during testing,analyzer will prompt "please add cleaning liquid" and stop test,when please add the cleaning liquid into the barrel then push "confirm" key to back to the main screen and push "sample test" key to go on test.**
- **If push "stop" key during test,the analyzer will stop after finishing the strips have dipped sample;after stop,the tube rack will back to its original position.**
- **The strips should be placed as the marked direction of the strip cabin,if the strips are placed in opposite direction the strips will be stuck in the strip cabin,the device can't work normally.**
- **Strips should be placed smoothly in the cabin,if not it may cause strip jam.If it happen strip jam during testing,please open the cap of the strip cabin,place the strips again and go on test.**

Attention

The rate for strip jam is not bigger than 1% is normal,please taking out the strips and placing in the strip cabin again is ok.

Chapter VII INSTRUMENT MAINTENANCE

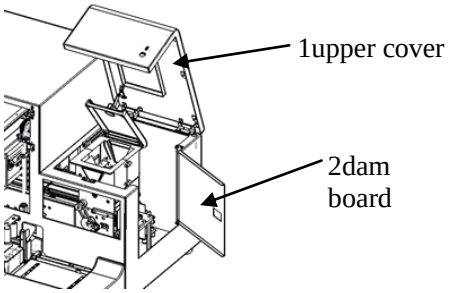
Items for instrument maintenance:brush,degreasing cotton,protective gloves,distilled water

7.1 clean strip cabin 清洁试纸密封仓

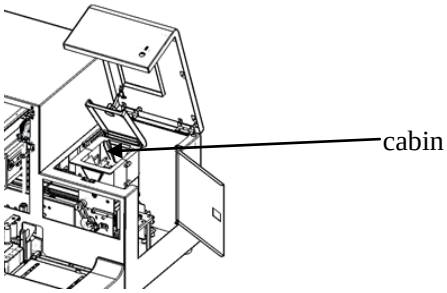
Device test every 1000strips,stop and clean,the screen will show “please clean strip cabin”,when push the “confirm” key on the screen,after two loud hum,the screen will show “please clean deskboard,then push “confirm” key to back to main screen.

When screen show “please clean deskboard”,please clean as the method below:

- open the cap of strip cabin;



Picture 7-1



Picture 7-2

- Take out the rest strips,take in the clean and dry barrel and close the cap to seal.
- Use the brush to clear the interior of the cabin to insure the stone steel is clean.(show as picture 7-3);
- Close the up cover of the strip cabin;
- Open the upper cover in the right(show as picture 7-1 for 1)，put down the dam board in the right of device(show as picture7-1 for 2),and put down strip cabin outside. (show as picture 7-2)
- Clean interior of stone wheel groove with bush to insure groove clean.(show as picture 7-4);
- Make the strip cabin and dam board in the right of device straight ,close upper cover in the right.

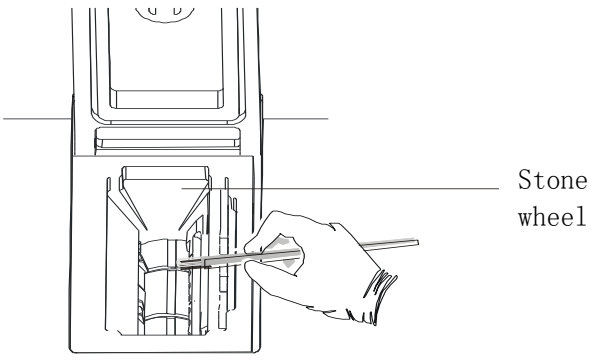


图 7-3

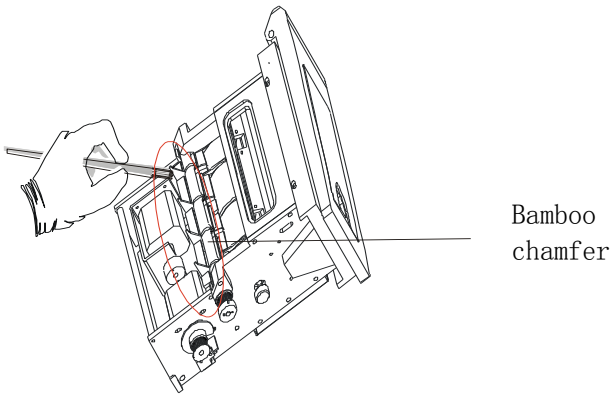


图 7-4

7.2 Clean waster box

Waste box should be cleaned every week

- Waste box can contain 5000strips
- Urine has potential infectivity ,please take protective measures when cleaning.
- Please according to the regulations of the clinical laboratory processing to deal with waste paper

Cleaning method:

- Take out of the waste box and throw away the strips
- Wash the waste box with water
- Wipe the waste box with cloth or dry in the air
- Sterilize the waste box
- Install the waste box on the bottom of the left of device(show as picture7-5)

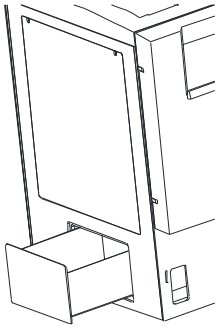


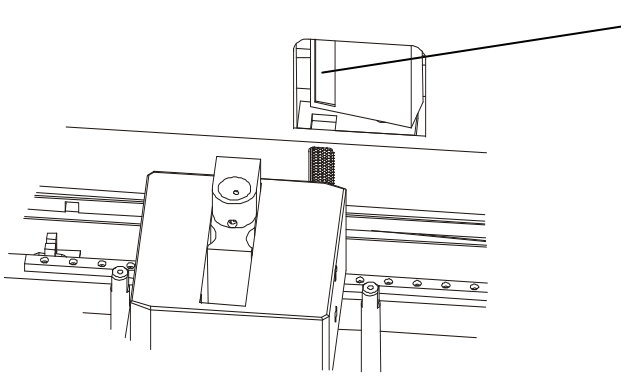
图 7-5

7.3 Clean waste barrel

Waste barrel should be cleaned every week

- When the waste barrel is full,outwell the waste in time
- Urine has potential infectivity ,please take protective measures when cleaning.
- Please according to the regulations of the clinical laboratory processing to deal with waste paper

7.4 Clean scan window of bar code reader 清洁条码阅读器扫描窗



Picture 7-6

To avoid the scan window surface of bar code reader is stained with besmirch and dust and make the bar code reader to read with mistake or not read,the scan window of bar code reader should be cleaned every week.

Cleaning method:Wash the scan window of bar code reader with degreasing cotton (show as picture 7-6).

7.5 Replace scavenging pump

To insure the accuracy of drip style for the instrument,advice to replace the washing pump every year.(show as picture 7-7).

Picture 7-7

7.6 Clean pipeline

In the picture 3-21 push “clean pipeline” key(effective coverage清洗管路),screen show as picture 7-8:

Picture 7-8

Take the cleaning liquid including into the test tube and quantity not less than 8ml,then insert tube into emergency and push “clean pipeline” key ,it will start to clean pipeline.

Chapter VIII TRANSPORTATION AND STORAGE CONDITION

8.1 Transportation request

The device should be waterproof and wetproof during transportation and prevent severe vibration and pressure.When transporting and loading should handle with care.

8.2 Storage request

Devices storage should be in the room without chemicals and corrosive gas,Ventilation is in good condition and clean,temperature during -40℃ to +50℃.

Appendix A

GURANTEE

Dear user:

Thanks for using YH-1800 full automatic urine analyzer,our company will provide you these services:

一 Provide technical advice at any time.

二 Warranty period for whole machine is one year from the day of purchase.

三 For below conditions,provide paid services:

（1）Warranty is expire.

（2）Damage cause by accident and unsuitable operation.

（3）Damage cause by not operating as using instruction or self to repair.

As the technical develop ,our company will provide update service for urine analyzer.

If you need technical support,please contact us:

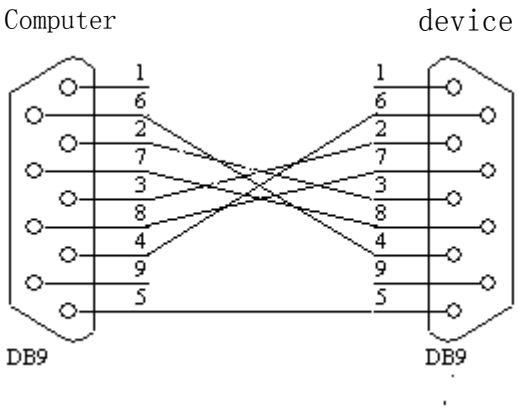
Appendix B

YH-1800Full automatic urine analyzer and computer interface

YH-1800 full automatic urine analyzer connect with computer via RS-232,communication protocol is as below:

Baud rate	9600，4800，1200、14400
Data bits	8bits
Stop bits	1bit
Check out	NO
hardware handshake	NO
Start	02H
Single-byte space	20H
Double-byte space	40H
New line	0DH0AH
End mark	03H

Connect for device with computer:



ID is set to starting data communication format(International unit,Conventional unit,plus sign system)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
STX	CR	LF																							
SP	×	×	×	×	-	×	×	-	×	×	SP	×	×	:	×	×				×	×	×	×	CR	LF
SP	M	E	A	S	SP	SP	N	O	.	SP	×	×	×	×	CR	LF									
SP	I	D	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF			
SP	P	O	R	T	SP	N	O	.	×	×	×	-	×	×	CR	LF									
SP(*)	U	B	G	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	B	I	L	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	K	E	T	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	C	R	E	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	B	L	D	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	P	R	O	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	M	A	L	B	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	N	I	T	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	L	E	U	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	G	L	U	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(!)	S	G	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	P	H	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	V	C	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	A	:	C	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	R	T	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(!)	C	O	L	O	R	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	T	U	R	B	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
ETX																									

ID is set to closing data communication format(International unit,Conventional unit,plus sign system)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
STX	CR	LF																							
SP	×	×	×	×	-	×	×	-	×	×	SP	×	×	:	×	×				×	×	×	×	CR	LF
SP	M	E	A	S	SP	SP	N	O	.	SP	×	×	×	×	CR	LF									
SP	P	O	R	T	SP	N	O	.	×	×	×	-	×	×	CR	LF									
SP(*)	U	B	G	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	B	I	L	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	K	E	T	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	C	R	E	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	B	L	D	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	P	R	O	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	M	A	L	B	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	N	I	T	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	L	E	U	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	G	L	U	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(!)	S	G	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	P	H	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	V	C	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	A	:	C	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP	R	T	SP	SP	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(!)	C	O	L	O	R	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
SP(*)	T	U	R	B	SP	SP	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	CR	LF	
ETX																									

注：

SP(*****)----SP OR *****

STX=0X02　CR=0X0D　　LF＝0X0A

SP＝0X20　　ETX＝0X03　X＝Any ASCII bits

Appendix C

YH-1800Full automatic urine analyzer output value

ITEM	abbr	Conventional system of units		International system of unit		Plus sign system
		Plus sign system open	Plus sign system close	Plus sign system open	Plus sign system close	
（Leukocytes）	LEU	Neg +- 1+ 2+ 3+ Ca15 Leu/μL Ca70 Leu/μL Ca125 Leu/μL >=Ca500 Leu/μL	Neg Ca15 Leu/μL Ca70 Leu/μL Ca125 Leu/μL >=Ca500 Leu/μL	Neg +- 1+ 2+ 3+ Ca15 Leu/μL Ca70 Leu/μL Ca125 Leu/μL >=Ca500 Leu/μL	Neg Ca15 Leu/μL Ca70 Leu/μL Ca125 Leu/μL >=Ca500 Leu/μL	Neg +- 1+ 2+ 3+
（Nitrite）	NIT	Neg Pos	Neg Pos	Neg Pos	Neg Pos	Neg Pos
（Urobilinogen）	UBG	Normal 0.2 mg/dL Normal 1 mg/dL 1+ 2 mg/dL 2+ 4 mg/dL 3+ >=8 mg/dL	0.2 mg/dL 1 mg/dL 2 mg/dL 4 mg/dL >=8 mg/dL	Normal 3.4μmol/L Normal 17 μmol/L 1+ 34 μmol/L 2+ 68 μmol/L 3+ >=135 μmol/L	3.4μmol/L 17 μmol/L 34 μmol/L 68 μmol/L >=135 μmol/L	Normal Normal 1+ 2+ 3+
（Protein）	PRO	Neg Trace Trace 1+ 30 mg/dL 2+ 100 mg/dL 3+ >=300 mg/dL	Neg Trace 30 mg/dL 100 mg/dL >=300 mg/dL	Neg Trace Trace 1+ 0.3 g/L 2+ 1.0 g/L 3+ >=3.0 g/L	Neg Trace 0.3 g/L 1.0 g/L >=3.0 g/L	Neg Trace 1+ 2+ 3+
(pH）	pH	<=5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 >=9.0	<=5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 >=9.0	<=5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 >=9.0	<=5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 >=9.0	<=5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 >=9.0
（Blood）	BLD	Neg +- 1+ 2+ 3+ Ca10 Ery/μL Ca25 Ery/μL Ca80 Ery/μL >= Ca200 Ery/μL	Neg Ca10 Ery/μL Ca25 Ery/μL Ca80 Ery/μL >= Ca200 Ery/μL	Neg +- 1+ 2+ 3+ Ca10 Ery/μL Ca25 Ery/μL Ca80 Ery/μL >=Ca200Ery/μL	Neg Ca10 Ery/μL Ca25 Ery/μL Ca80 Ery/μL >= Ca200Ery/μL	Neg +- 1+ 2+ 3+
(Specific Gravity)	SG	<=1.005 1.010 1.015 1.020 1.025 >=1.030	<=1.005 1.010 1.015 1.020 1.025 >=1.030	<=1.005 1.010 1.015 1.020 1.025 >=1.030	<=1.005 1.010 1.015 1.020 1.025 >=1.030	<=1.005 1.010 1.015 1.020 1.025 >=1.030
（Ketone）	KET	Neg +- 5 mg/dL 1+ 15 mg/dL 2+ 40 mg/dL 3+ >=80 mg/dL	Neg 5 mg/dL 15 mg/dL 40 mg/dL >=80 mg/dL	Neg +- 0.5 mmol/L 1+ 1.5 mmol/L 2+ 3.9 mmol/L 3+ >=7.8 mmol/L	Neg 0.5 mmol/L 1.5 mmol/L 3.9 mmol/L >=7.8 mmol/L	Neg +- 1+ 2+ 3+
（Bilirubin）	BIL	Neg 1+ 1 mg/dL 2+ 3 mg/dL 3+ >=6 mg/dL	Neg 1 mg/dL 3 mg/dL >=6 mg/dL	Neg 1+ 17 μmol/L 2+ 51 μmol/L 3+ >=103 μmol/L	Neg 17 μmol/L 51 μmol/L >=103 μmol/L	Neg 1+ 2+ 3+

（Glucose）	GLU	Neg 1+ 100 mg/dL 2+ 250 mg/dL 3+ 500 mg/dL 4+ >=1000 mg/dL	Neg 100 mg/dL 250 mg/dL 500 mg/dL >=1000 mg/dL	Neg 1+ 5.6 mmol/L 2+ 14 mmol/L 3+ 28 mmol/L 4+ >=56 mmol/L	Neg 5.6 mmol/L 14 mmol/L 28 mmol/L >=56 mmol/L	Neg 1+ 2+ 3+ 4+
VC	VC	0 mg/dL 10 mg/dL 25 mg/dL 50 mg/dL >=100 mg/dL	0 mg/dL 10 mg/dL 25 mg/dL 50 mg/dL >=100 mg/dL	0 mmol/L 0.6 mmol/L 1.4 mmol/L 2.8 mmol/L >=5.7 mmol/L	0 mmol/L 0.6 mmol/L 1.4 mmol/L 2.8 mmol/L >=5.7 mmol/L	0 mmol/L 0.6 mmol/L 1.4 mmol/L 2.8 mmol/L >=5.7mmolL
（Creatinine）	CRE	10 mg/dL 50 mg/dL 100 mg/dL 200 mg/dL 300 mg/dL	10 mg/dL 50 mg/dL 100 mg/dL 200 mg/dL 300 mg/dL	0.9 mmol/L 4.4 mmol/L 8.8 mmol/L 17.7 mmol/L 26.5 mmol/L	0.9 mmol/L 4.4 mmol/L 8.8 mmol/L 17.7 mmol/L 26.5 mmol/L	0.9 mmol/L 4.4 mmol/L 8.8 mmol/L 17.7 mmol/L 26.5 mmol/L
(Microalbumin)	MALB	10 mg/L 30 mg/L 80 mg/L 150 mg/L	10 mg/L 30 mg/L 80 mg/L 150 mg/L	10 mg/L 30 mg/L 80 mg/L 150 mg/L	10 mg/L 30 mg/L 80 mg/L 150 mg/L	10 mg/L 30 mg/L 80 mg/L 150 mg/L
A:C RT	A:C RT	<30mg/g Normal 30-300 mg/g Abnormal >300 mg/g High abnormal	<30mg/g Normal 30-300 mg/g Abnormal >300 mg/g High abnormal	<3.4mg/mmol Normal 3.4-33.9 mg/mmol Abnormal >33.9 mg/mmol High abnormal	<3.4mg/mmol Normal 3.4-33.9 mg/mmol Abnormal >33.9 mg/mmol High abnormal	<3.4mg/mmol Normal 3.4-33.9 mg/mmol Abnormal >33.9 mg/mmol High abnorma
（Color）	Color	Colorless Dark red Red Light red Blue Dark blue Green Dark green Yellow Dark yellow Light yellow Brown Dark brown Orange Dark orange Light orange Purple Dark purple others	Colorless Dark red Red Light red Blue Dark blue Green Dark green Yellow Dark yellow Light yellow Brown Dark brown Orange Dark orange Light orange Purple Dark purple others	Colorless Dark red Red Light red Blue Dark blue Green Dark green Yellow Dark yellow Light yellow Brown Dark brown Orange Dark orange Light orange Purple Dark purple others	Colorless Dard red Red Light red Blue Dark blue Green Dark green Yellow Dark yellow Light yellow Brown Dark brown Orange Dark orange Light orange Purple Dark purple others	Colorless Dark red Red Light red Blue Dark blue Green Dark green Yellow Dark yellow Light yellow Brown Dark brown Orange Dark orange Light orange Purple Dark purple others
（Turbidity）	Turbid ity	clear Turbidity Heavy turbidity	clear Turbidity Heavy turbidity	clear Turbidity Heavy turbiddity	clear Turbidity Heavy turbidity	clear Turbidity Heavy turbidity

APPENDIX D

The fault information table

No	Fault prompt/Possible fault	Solution
1	Strip cabin communication error	Check if the connect of ligature and connector is tight.
2	Please add cleaning liquid	Add cleaning liquid,push sample test key to restart test.
3	Tube rack doesn't reach the designated location	Reset tube rack,push sample test key,generally caused by placing tube rack too late.
4	Sample transmitter communication error	Power off and start again.
5	Strip cabin jam	Strips are placed wrong direction,reset strips as the marked direction. Check if there is strip stuck inside. Check if the strips placed orderly. The rate for strip jam is not bigger than 1% is normal,taking out the strips and then placing orderly in strip cabin is ok.
6	No strips in strip cabin	Add strips
7	Strip doesn't reach the designated position (report print as "strip slanted")	Clean worktable and toothed plate,worktable on both sides of the wall and support slideway is smooth.Check if the strip specification is right.
8	Waste box is full	Dump the strips in waste box.
9	Drops of sample is not accurate.	Check if there is bubble,leakage , blood for urine sample and other physical clutter on hydraulic pipeline,change sealing ring or connector. Check if the urine sample in tubes is lower than tick mark of tube rack. If use the dedicated cleaning liquid. Check if there is blocking for probe. If there is individual strip piece can't dip sample,please check if there is leakage for the pump or connector leakage for tube and pump.
10	Fault for probe moves up and down	Please check if the connector is tight,restart the device;if still can't rule out fault,please contat with supplier.
11	Fault for probe moves front and back	
12	Inject pump fault	Please contact with supplier.
13	Up and down motor optocoupler fault	Please contact with supplier.
14	Transport strip motor optocoupler fault	

15	Push strip electrical machine optocoupler fault	
16	Strip lost	Strip location is wrong or jam in the Bamboo chamfer of strip cabin,please take out the incorrect strip and retest.
17	“Strip error”	Strip direction is wrong or strip cabin fault causing strip reverse side is up,if this happen time and again,please contact with supplier.
18	Strip cabin doesn’t finish choosing strips	Check if the strips is stuck in the bamboo chamfer of strip cabin ,if still can’t solve,please contact with supplier.
No	Fault prompt/Possible fault	Solution
19	Device doesn’t detect bar code	Check if the bar code is stick correct on the test tubes. Check if the type of bar code is correct. Check the location stick bar code is correct. Check if the connect for bar code is good. Check if ID setup is closed.
20	The ambient light is abnormal	Don’t place the device with direct sunlight to test.
21	White reference is high or low	Wipe the surface of white reference with degreasing cotton,if still can’t solve the problem,please contact with supplier.
22	Emergency port is not in place	Push emergency port to locked location.
23	Emergency port has no sample	Put sample in emergency port.
24	Calibration not ok	Please contact with supplier.
25	LED fault	Please contact with supplier.
26	Testing motor optocoupler fault	Please contact with supplier.
27	Scan no test tubes	Please contact with supplier.
28	Please calibrate hydrometer	Calibrate hydrometer with supplier’s hydrometer calibration solution.
29	Hydrometer calibration failed	Check if the connecting lines for hydrometer is good,hydrometer calibration still fail with good connector,please contact with supplier.
30	Turbidimeter calibration failed	Check if the connecting lines for turbidimeter is good,turbidimeter calibration still fail with good connector,please contact with supplier
31	Clean hydrometer	Clean hydrometer with cleaning liquid from supplier.
32	Hydrometer is abnormal	Please contact with supplier.
33	Turbidimeter calibration	Calibrate turbidimeter with calibration solution from supplier.
34	Clean turbidimeter	Clearn turbidimeter with cleaning liquid from supplier.
35	Turbidimeter is abnormal	Please contact with supplier.
36	High or low temperature	Device testing with temperature between 15℃～35℃.
37	Colour calibration failed	Check if the connecting lines for colour sensor is normal,if abnormal, process the lines,if normal but colour calibration still failed,please contact with supplier.
38	Please clean strip selector	Push enter key and clean strip selector.

39	Please clean platform	Push enter key and clean platform.
40	Sampler fault0	1.check transportation motor(no.127) 2.check rack truck piece 3.check rack truck optocoupler(no.122) 4.check if the tube rack is in condition 5.contact with supplier
41	Sampler fault 1	1.check transportation motor(no.127) 2.check rack truck piece 3.check rack truck optocoupler(no.128) 4.check if the tube rack is in condition 5.contact with supplier
42	Sampler fault 2	1.check transportation motor(no.127) 2.check rack truck piece 3.check rack truck optocoupler(no.128) 4.contact with supplier
43	Sample fault 3	1.check transportation motor(no.127) 2.check rack truck piece 3.check rack truck optocoupler(no.128) 4.contact with supplier
44	Sampler fault 4	1.check right shifter fork rack truck motor(no.121) 2.Check installation of right shifter fork 3.Check the smoothness of linear guide 4.check no. 122 optocoupler 5.contact with supplier
45	Sampler fault 5	1.check no.107 and no. 113 optocouple 2.contact with supplier
46	Sampler fault 6	1.Check installation of left shifter fork 2.check the tightness of belt 3.check if there is foreign matter in the left disk 4.check no. 107 optocoupler 5.contact with supplier
47	Sampler fault 7	1.Check electrical socket outlet installation of connecting bridge 2.Check(JP7) optocoupler。
48	Sampler fault 8	1.Check if the shift optocouple baffle is back 2.Check shift optocouple（142） 3.Check Sensitivity of the shift optocouple baffle
49	Sampler fault 9	1.Clean tube rack and other object of the left channel 2.Check（107）optocouple

Attention:This manual is only used to provide information,if any changes,please forgive no prior notice.

If you have any questions please dial below service telephone no. for consultation.

Tel.:+86-43181317781