

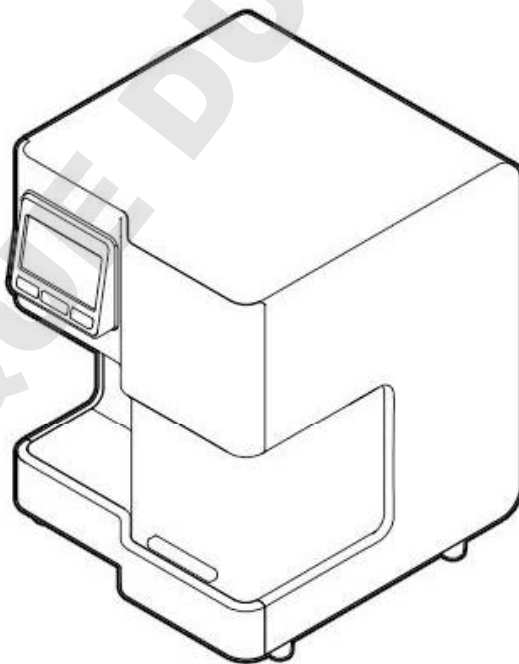
Revision Record

Version	Modification description	Date	Updated by
V1.0	Initial issue	2020.03.04	Youdong Zhang
V2.0	Renew part content of APP	2020.04.22	Youdong Zhang

Operation Manual

V2.0

Auto-Pure Series Nucleic Acid Purification System



ALLSHENG

Hangzhou Allsheng Instruments Co., Ltd.

Forewords

Thank you for purchasing Auto-Pure series Nucleic Acid Purification System. In order to use the instrument properly, please read carefully this manual before operating and keep it well for future reference.

Opening Check

Please check the instrument and Appendix with the packing list when you first open the package. If you find anything missing or incorrect, please contact the distributor.

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File No.: AS182SM

File Version: March, 2020 the 2nd Version

Safety Warnings and Guidelines

1 Warning

Please read this manual carefully before operation.



Operation without reading the manual may cause damage or even electrical shock.

2 Safety

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and cautions as below. Improper use of the instrument may cause damage to the system, inaccurate results or potentially nullify warranties.



Indoor use only! This instrument is a class I B ordinary equipment in accordance with GB 9706.1 standard.



Please read this manual carefully before using the instrument, only qualified people can operate.



Operator should not open or repair the instrument without vendor's authorization, or there might be potential damages or injuries and also will affect the warranty.



Before connecting to power, make sure the voltage used is same as the instrument required, and the maximum rated load should be sufficient for the instrument. Please replace the power cord with same specs if the power cord is damaged. Please make sure there's nothing covered the power cord and keep it away from crowds when in use.



During operation, the surface temperature of heating block inside operation window could be very high. To avoid possible scald or boiling of the liquid, do not touch the metal part when operating.



The Instrument should be placed in a position with low humidity, less dust, and keep it away from water, sunshine and strong light source. Make sure of adequate ventilation, no corrosive gases, no strong magnetic interference to avoid any heat sources.

Openings on the instrument are for ventilation. To avoid overheating, do not block or cover these vents. When some instruments are used at the same time, the space for each instrument should be no less than 100cm.



Power off the instrument after operation and please disconnect the plug if long time no use and cover it to prevent from dust.



Under the following circumstances, please disconnect the power immediately and contact with your distributor.

- Liquid into the instrument
- Drenched by rain or water
- Instrument can not work normally, especially when any abnormal sound or smell occurs.
- Enclosure damaged

3 Maintenance

The inner side should be cleaned periodically by a cloth with small quantity of absolute alcohol. If there are any stains on the Instrument, clean them with cleansing cream.

4 The limiting condition of transportation and storage environment

Ambient temp. Range: 10°C~35°C

Relative humidity: ≤70%

Atmosphere range: 500~1060hPa

No corrosive gas or a well-ventilated room.

5 Post-sale service

a) Warranty Content

Within one month from the date of delivery, the company will guarantee the replacement of the instrument for defects in materials and manufacturing.

This instrument is guaranteed for failure caused by material and manufacturing defects within 12 months from the date of delivery. During the warranty period, our company will selectively repair or replace the instrument which is proved to be defective.

The guaranteed products should be sent by the user to the maintenance department designated by the company. The users should pay for the freight of deliver the equipment to the company and we will pay for the freight of deliver back.

We will charge the cost of repairing if the equipment is out of warranty period.

b) Warranty Coverage

The above warranty is not applicable to the damage caused by improper use and maintenance of the user, the user under non-conforming conditions, unauthorized maintenance or modification.

After-sales service: Hangzhou Allsheng Instruments Co., LTD

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Chapter One Brief Introduction

Auto-Pure 10B/10BS/16A Nucleic Acid Purification System are new models for DNA/RNA, Protein and cells purification, they use the magnetic rod to adsorb, transfer and release magnetic particles. Auto-Pure 10 series can extract 10 samples at most a time while 16A can accept 16 samples. They can be used for extracting nucleic acids from animal or plant tissues, blood, body fluids, matching with different magnetic bead nucleic acid reagents, mainly for extraction and purification of nucleic acid from human samples.

1. Application

This instrument can be used for Nucleic Acid extraction and purification of animal or plant tissue, blood, body fluid etc.(mainly for human body sample)

2. Life Span

5-year is recommended, for production date please see the label on back of the instrument.

Features:

- Friendly interface - 4.3 inch touchscreen, mouse is also available.
- Open software system - protocols are with editable function.
- With heating function - with heating function during Lysis and Elution process, also incubation is available.
- Self sterilization - with UV sterilizing function which can reduce the possibility of contamination in experimental area.
- Stability - very low noise during working and with no vibration.
- Safe and reliable - full automatic reagent with disposable consumables

which protect users from hazardous reagents.

- Fast extraction - generally 10 ~ 60min/time for different reagents.
- High quality consumables-qualified materials and processes which guarantee high yield and low loss of magnetic beads.
- APP software - for pad or mobile phone with Android system.
- Expanded function-4G, bluetooth, WiFi and image capture are supported.

Chapter Two Specifications

1. Working Conditions

Ambient temperature: 10°C~35°C

Relative humidity: ≤70%

Input Voltage: AC100~240V, 50Hz/60Hz

2. Basic Parameters and Performance

Model Parameters	Auto-Pure10B	Auto-Pure10BS	Auto-Pure16A
Principle	Magnetic Beads Method		
Sample volume	50μL-5000μL		50μL-1000μL
Throughput	10		16
Stability	CV≤5%		
Lysis Temp.	RT. temp. ~ 120°C		
Elution Temp.	RT. temp ~ 120°C		
Temp. accuracy of lysis/elution	±1°C		
Incubation temp.	No	RT. temp.~105°C	No
Accuracy of incubation temp.	/	±0.5°C	/
Incubation temp. uniformity	/	±0.5°C	/
Mixing speed	10 speed available for option		
Operation interface	4.3-inch touch screen		
QR code identification	With build-in QR scanning module, easy import or invoke protocols		
APP software	Can be used for protocol editing, QR code generating etc.		
Data storage	With build-in SD card, protocols or data can be imported or exported		
Instrument port	With USB port, ethernet port, as well as RS232 port		
Extended function	4G, bluetooth, Wifi and image capture		
Power supply	AC100-240V, 50Hz/60Hz, 250VA		
Dimension (W × D × H)	340 × 350 × 410mm		
Weight	20Kg		

3. Outline Dimension

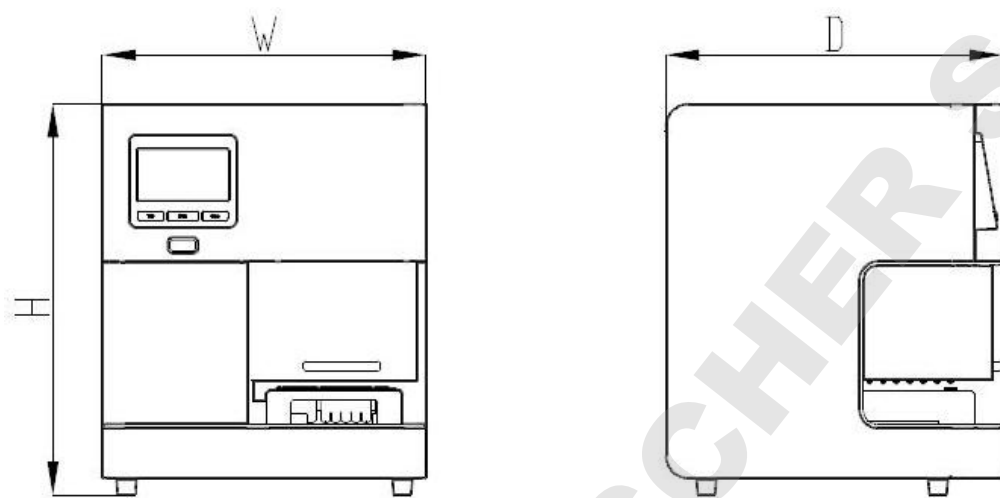


Fig 1

Dimension (W × D × H): 340 × 350 × 410mm

Chapter Three Basic Information

This chapter basically introduced instrument structure, operation buttons, display panel as well as preparations before operation. Please make sure to read this chapter carefully before using.

1. Structure

1.1. Front

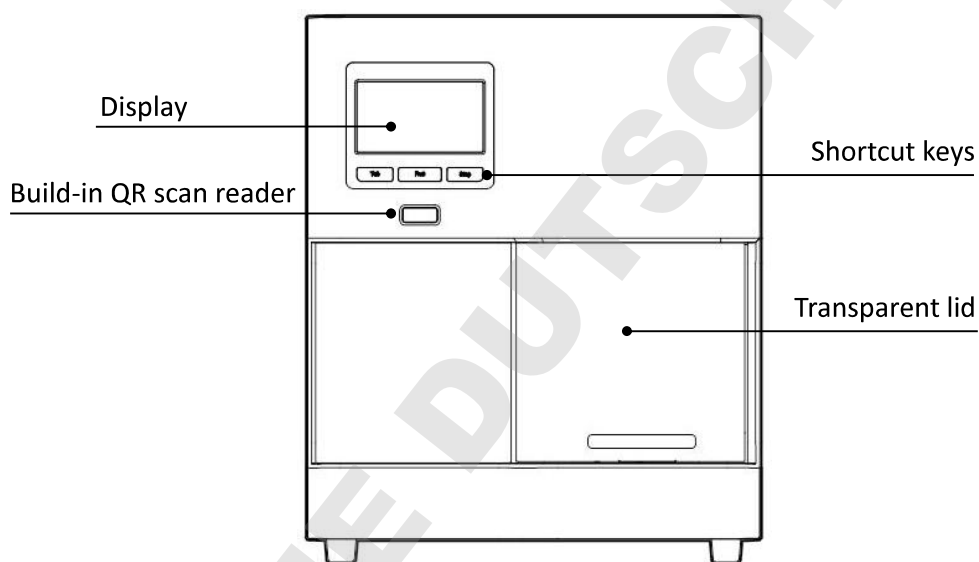


Fig 2

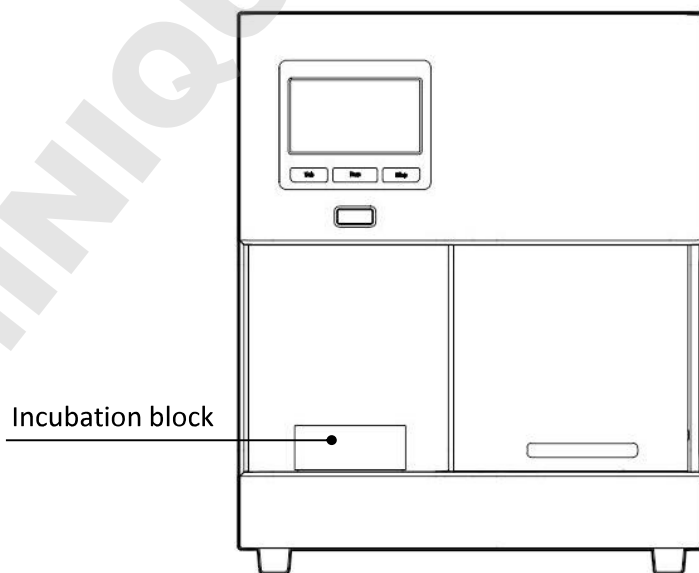


Fig 3

1.2. Back

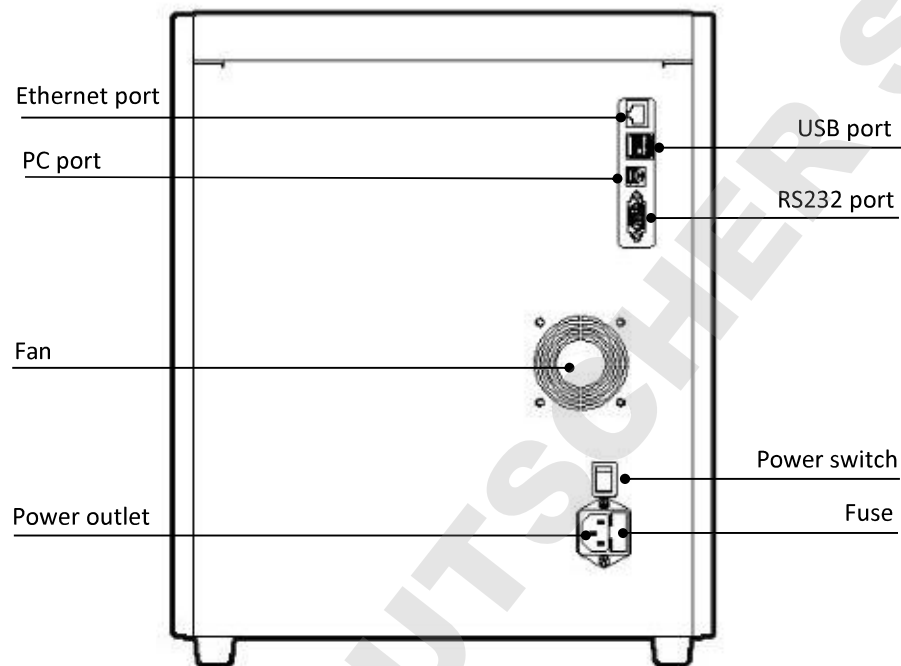


Fig 4

1.3. Auto-Pure 10B experimental area

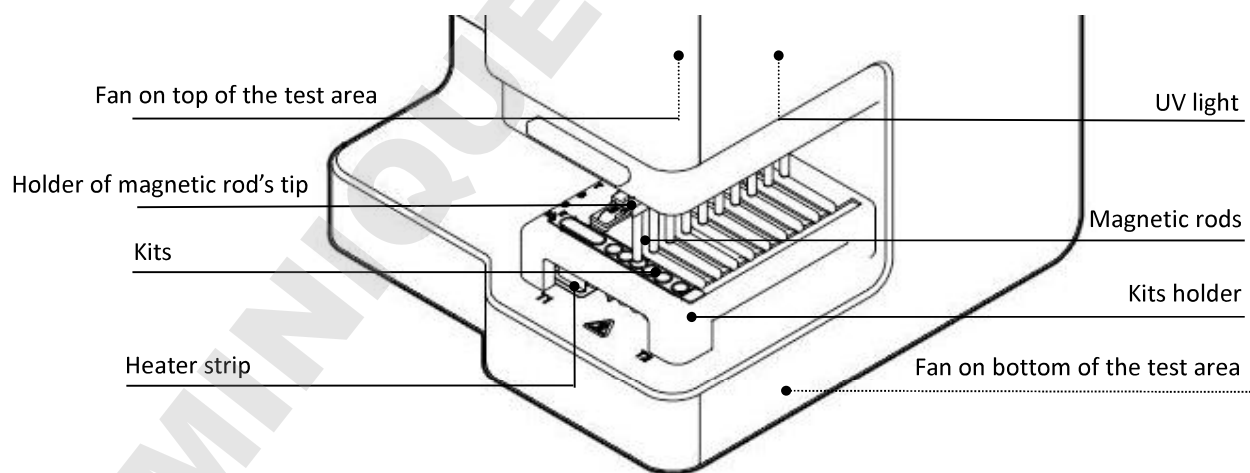


Fig 5

1.4. Auto-Pure 10BS test area (10BS is the same with 10B, except increased compared an incubation block).

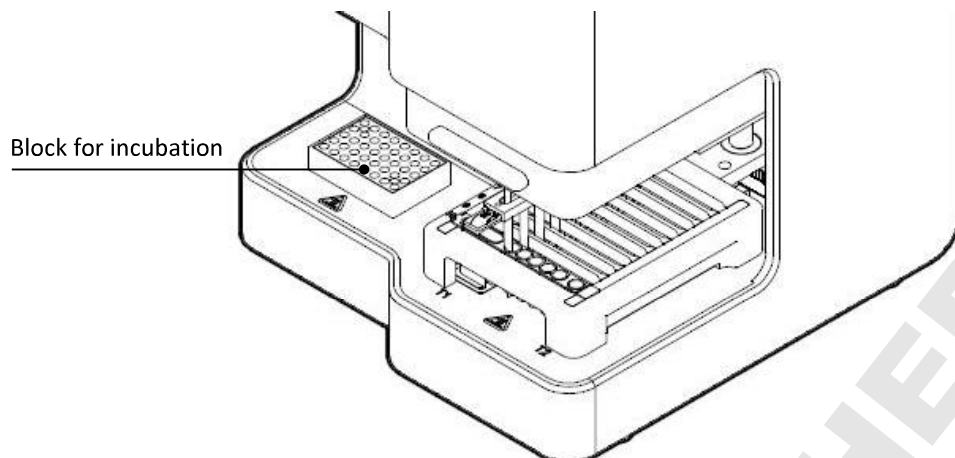


Fig 6

1.5. Auto-Pure 16A test area

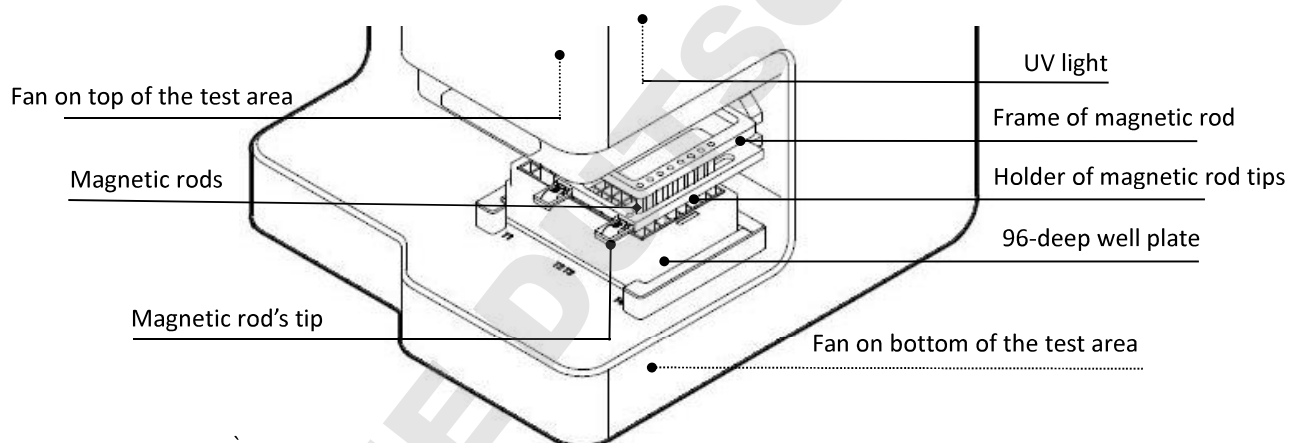


Fig 7

2. Operation Panel

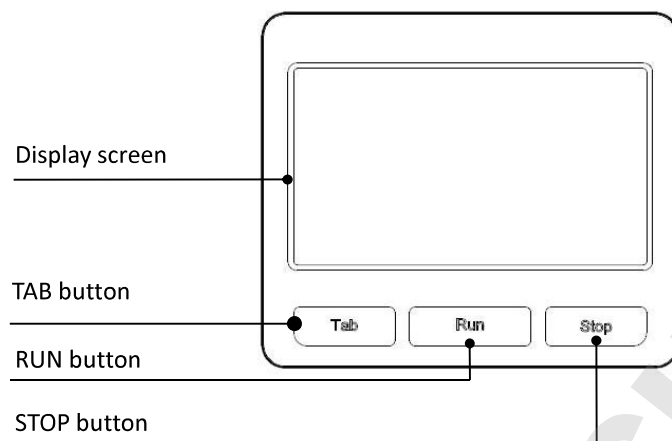


Fig 8

Display screen: touch screen and mouse is also available.

TAB: switching between protocols

RUN : start the instrument

STOP: stop the operation

Chapter Four Operations

1. Preparation

Open the transparent lid, remove the screw and release the moving component.

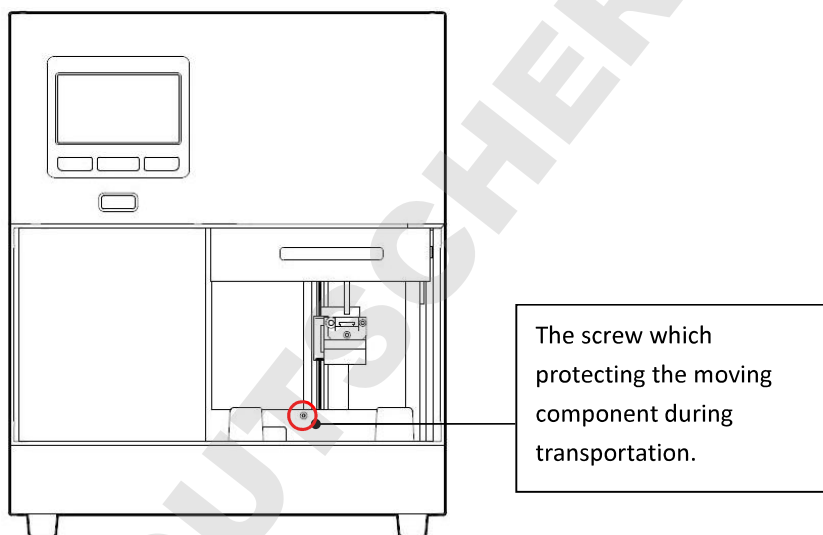


Fig 9

Note: Please pay more attention to magnetic rods during the operation in case any damage!

2. Connect power supply

Attention to the voltage (AC 100~240V) please.

3. Reagent kits installation

3.1 Auto-Pure 10B/10BS tube strip installation

Open the transparent lid, put tube strips on the holder. Attention to it's direction: number one well should be on the left side, 10 strips can be put a time at most.

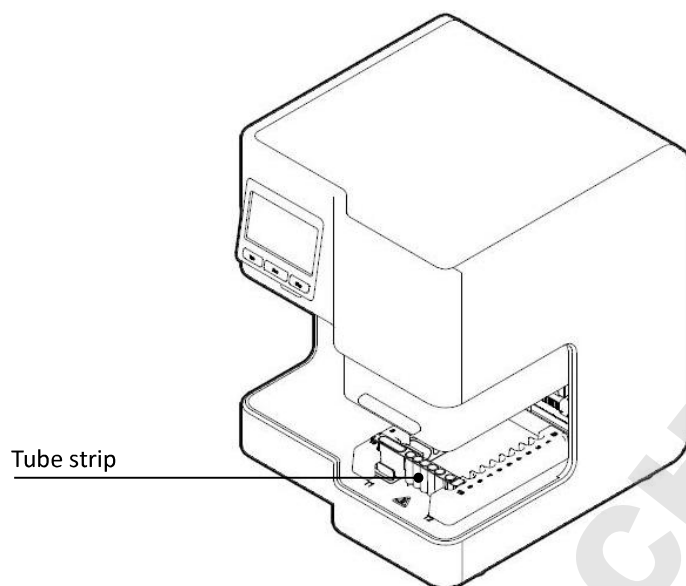


Fig 10

3.2 Auto-Pure 16A 96-deep well plate installation

Open the transparent lid, put 96-deep well plate in it's position according to the arrow ① shown below, then press it into the groove in accordance with arrow ②. Attention to the direction in case any wrong reagents sequence, then close the transparent lid.

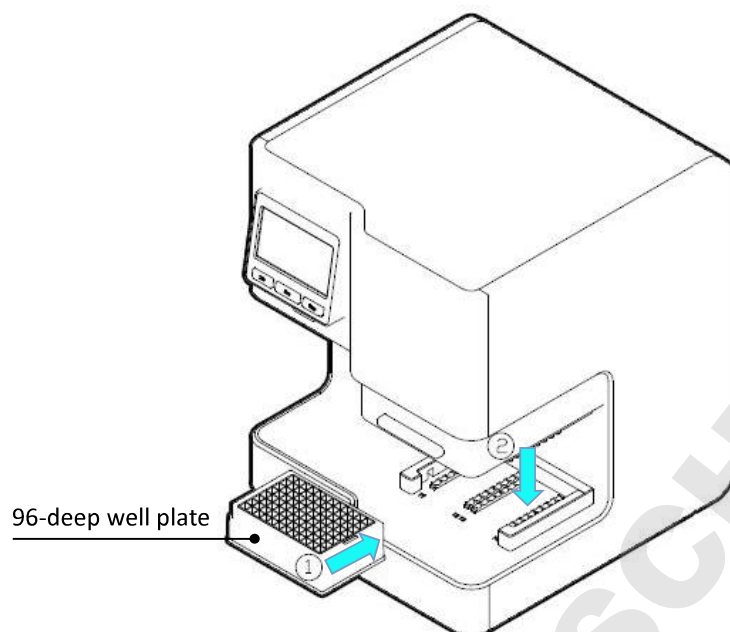


Fig 11

4. magnetic rod's tip installation

4.1 Auto-Pure 10B/10BS magnetic rod's tip installation

Insert the magnetic rod's tip into the groove according to the arrow shown on below picture.

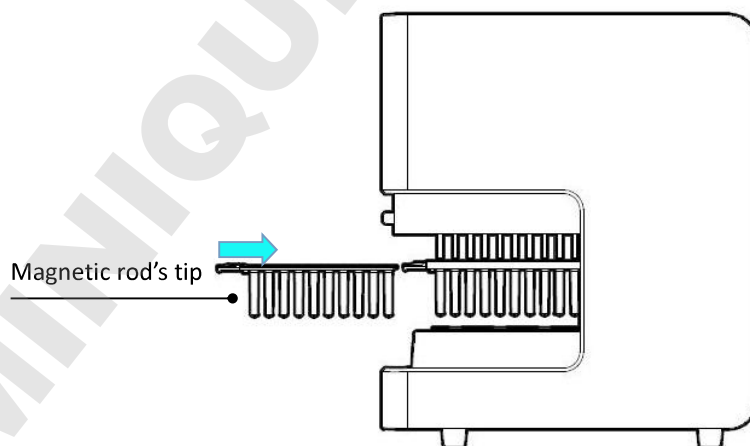


Fig 12

4.2 Auto-Pure 16A magnetic rod's tip installation

Same as the above, insert the magnetic rod's tip into the groove according to

the arrow shown on below picture.

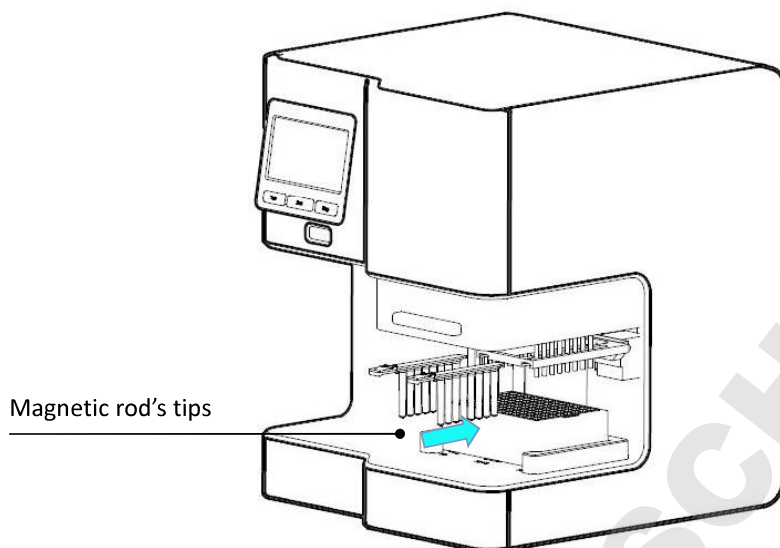


Fig 13

Note: Auto-Pure 16A 2pcs of magnetic rod's tip can be installed at most.

5. Remove magnetic rod's tip

Press the button according to arrow ①, then pull it out by the direction of arrow ②.

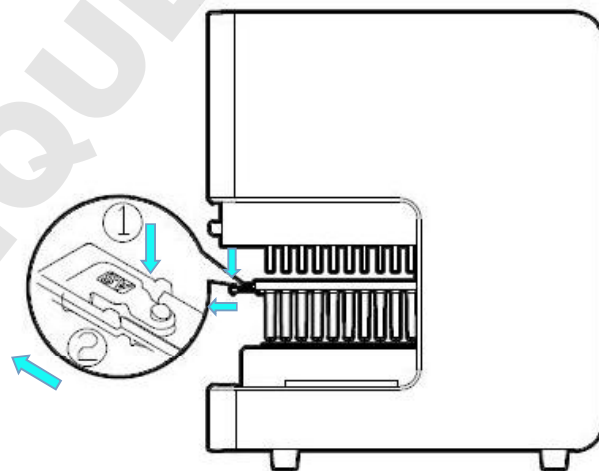


Fig 14

Note: Auto-Pure 10B, 10BS and 16A have the same way of removing magnetic rod's tip.

6. Instrument Operation

The software for this instrument includes two parts: APP software and instrument embedded software.

APP software only supports mobiles with Android system to edit protocols and generate QR code while embedded software is mainly for experimenters to run protocols and set parameters.

6.1 App Software

6.1.1 APP installation

Put the APK file which is standard with instrument in internal storage of a phone (Android 7.0 or above is required), then go to file management, then internal storage to install the APK file.

See the following figure:

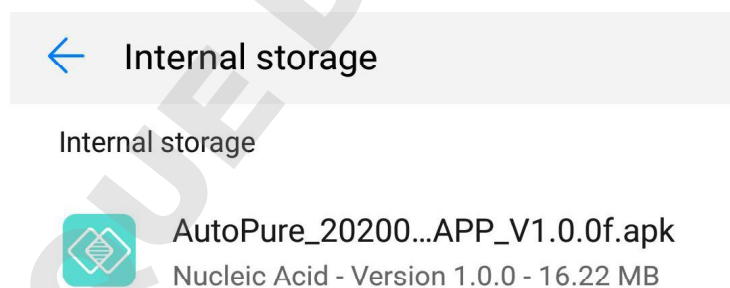


Fig 15

6.1.2 The main interface

After finishing the installation of the software, click icon " " on the desktop to startup interface which includes version information and then to the main interface.



Auto Extraction System



Auto-Pure 10BS



Fig 16

6.1.3 Program Interface

Choose the correct model in the main interface, click "enter" button to protocol main interface, see Fig 17.



Fig 17

6.1.4 Protocol Creation

Click "+" button, enter a name in the pop-up box to create a new protocol.

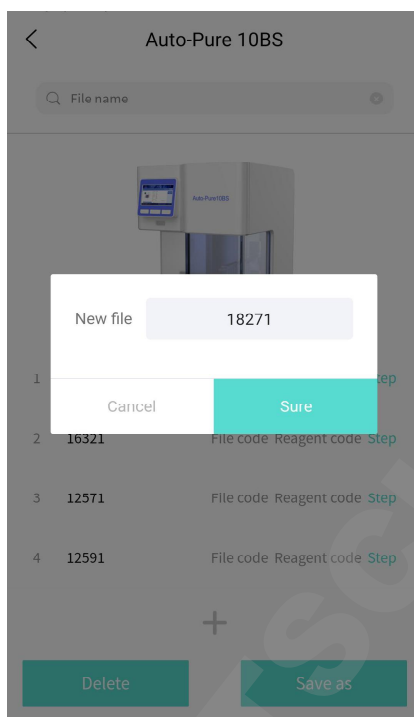


Fig 18

Then the instrument will enter into the editing interface automatically, here users can create, delete, preview or edit steps.

Ordinary: the regular steps of nucleic acid extraction, including mixing, magnetic absorption and other parameters.

Pause step: mainly pausing in the middle of an experiment for adding reagents, changing consumables, here the alarm can be set, the device can emit three beeps every 30s when it runs to pause step.

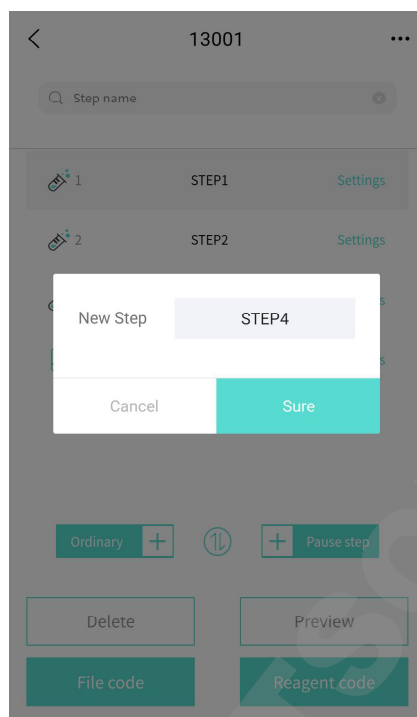


Fig 19

Remark: the Max step numbers of a program is 100.

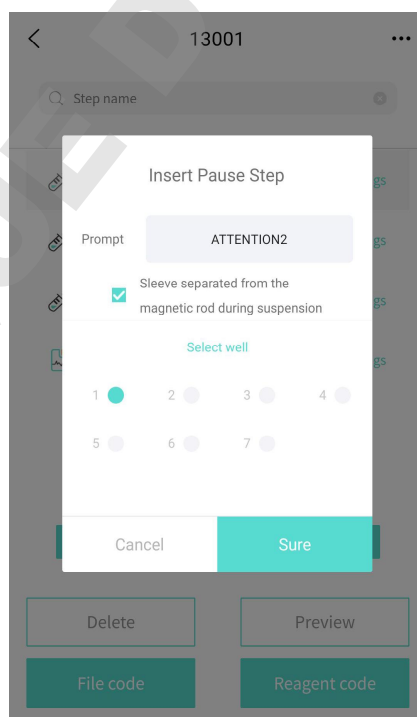


Fig 20

Two side-by-side screenshots of the STEP1 configuration screen. The left screen shows the 'Base parameter' tab with fields for Name (STEP1), Well (1), Volume (200), Mix time (0), Mix speed (5), and Mix scope (80). The right screen shows the 'Magnet parameter' tab with fields for Segments (0), Liquid level magnet time (0), Magnet speed (0.5), Cycle (1), Dry wait (0), and Absorption time (0). Both screens have a 'Save' button at the bottom.

Fig 21

A screenshot of a mobile app interface showing a dialog box titled "Insert Pause Step". The dialog box has a "Prompt" field with the text "ATTENTION2". Below it, there is a checkbox labeled "Sleeve separated from the magnetic rod during suspension" which is checked. Underneath the checkbox is a "Select well" section with seven radio buttons numbered 1 through 7. At the bottom of the dialog box are "Cancel" and "Sure" buttons. The background shows a list of steps with buttons for "Delete", "Preview", "File code", and "Reagent code".

Fig 22

Delete: delete unnecessary steps.

Preview: mainly used for previewing a newly added protocol.

In addition, the steps can be moved up and down by clicking icon "①↓".



Fig 23

Table 1. Step parameters explanation:

Step Info.	Meaning
Name	The name of a step
Well	the well position for a running step
Volume	the volume of a well
Mix time	set the time of mixing, the time range is 0.0 ~ 99.9min, the default time is 0.0min
Mix speed	The speed range is 0 ~ 10 and the default speed is 5
Mix scope	the mix amplitude range is 10 ~ 100%, the default is 80%
Mix pos.	the range is 0 ~ 100%, default is 0%
Temp.	Temperature range is 37 ~ 120℃, the default is OFF

Segments	The segment can be set from 0 to 5, and it will be no magnetic absorption if choose 0.
Liquid level magnet time	Time range is 0 ~ 199s, the default time is 0.
Magnet speed	Speed range is 0.1 ~ 15, the default speed is 0.5.
Cycle	range from 1-10, default as 1.
Dry wait	Drying time range is 0.0 ~ 99.9min, the default time is 0.0min.
Absorption time	Time for absorption
Magnet pos.	Set the magnetization place, range from 0-100%, default as 0%

In step editing interface(see the left of the following Fig. 24), click “...” at top right corner to enter into optional interface for senior parameters settings(see table 3), and then click “save” after finishing settings.

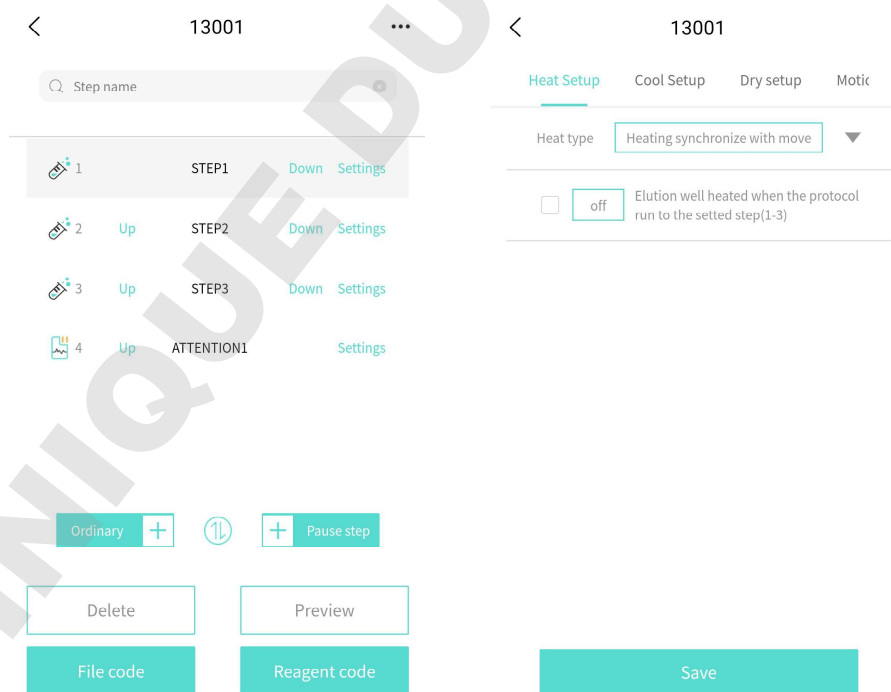


Fig 24

Table 2.

Name	Options	Description
Heat Setup	Heating synchronize with move	when running to the heating well, heating will be operated with rods or tips at the same time.
	Heat first, then move	When running to the heating well, after the temperature of the heating well reaches the preset temperature, the magnetic rods or tips will start to operate.
	Move after heated to specified T	When running to the heating well, heat up to the preset temperature, the rods or the tips then move.
	Elution well heated when the protocol run to the setted step(1-3)	Elution well heating in advance, 3 steps in advance at most.
Cool Setup	Cool synchronize with move	When the actual temperature is higher than set temperature, it will be cooled to the specified temperature, then the rods or the tip will move.
	Cool first, then protocol run	when the actual temperature is higher than the set temperature, the cooling will be operated at the same time with the rods or tips.
	Move when cool to Specified T	When running to this step, if the actual temperature is higher than the set temperature, the temperature will be cooled to the specified temperature, then the rods or the tip will move.
	Cool fan	Users can choose ON or OFF
Dry Setup	Above plate	When instrument in the process of waiting, the magnetic rod's tips is in the above of kits
	Specified position	Magnetic rod's tips locates at the set height over the liquid level
	Dry fan	ON and OFF for option
Motion Parameter	Horizontal speed (1-50)mm/s	The speed of moving left and right.
	Magnetic rod lifting speed(1-100)mm/s	The lifting speed of magnetic rods.
	Magnetic rod's tip lifting speed(1-100)mm/s	The lifting speed of magnetic rod's tip.

6.1.5 Protocol delete and save as

Please see Fig 25 and 26.

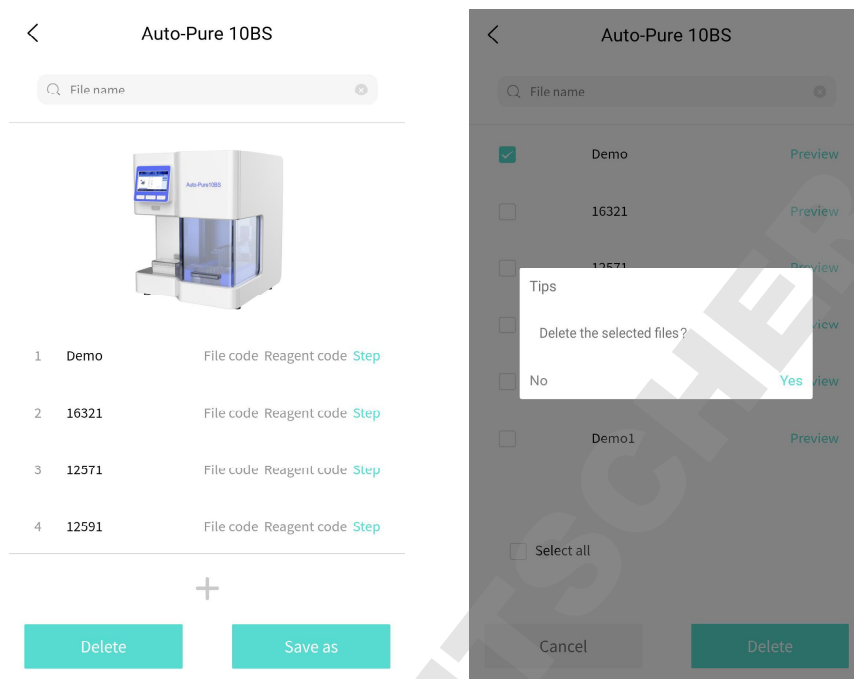


Fig 25

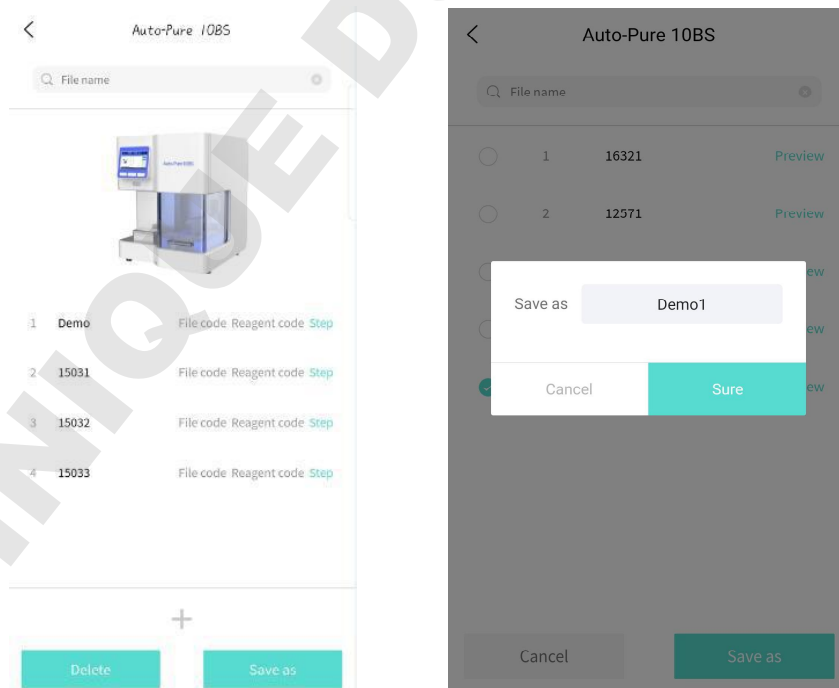


Fig 26

6.1.6 QR code generation

The QR code includes file code and reagent code. The file code is used for generating step information while reagent QR code for the protocol only which is used for retrieving corresponding protocols for quick operation.

After finishing creating protocol, QR codes can be generated in step editing interface or protocol list interface, press button “File code” to generate protocol QR code (a page of QR code can be generated every 15 steps, up to 100 steps can be edited, up to 7 pages of QR code), as shown in the following figure.

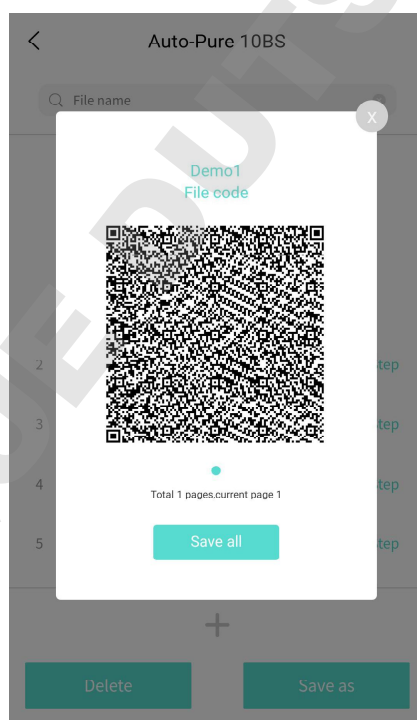


Fig 27

Click “Reagent code” to generate corresponded reagent QR code, scanning the code to retrieve the corresponding protocol from the instrument.

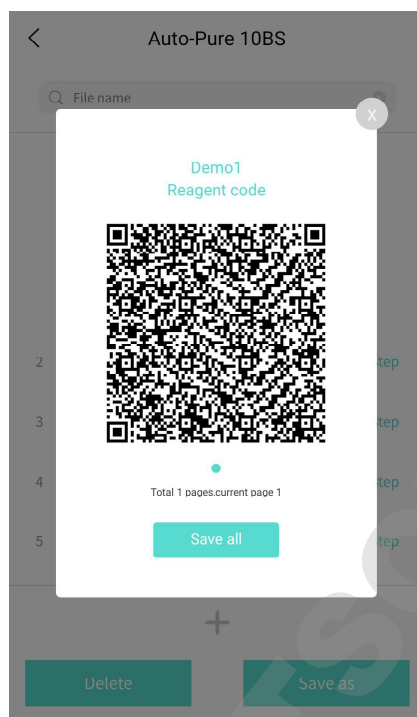


Fig 28

Both the file code and reagent code can be saved to the local by clicking “Save all”. The file code will be save with the name format of “Instrument model-file name-file code-current page number/total page number” while the reagent code will be with “Instrument model- file name-reagent code”, see Fig 29 please.

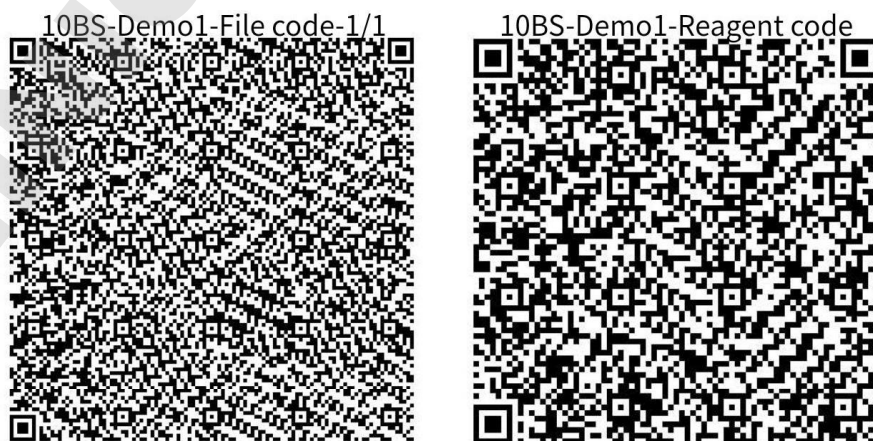


Fig 29

6.1.7 Search function

Both the protocol list interface and edit interface support searching function, see Fig 30.

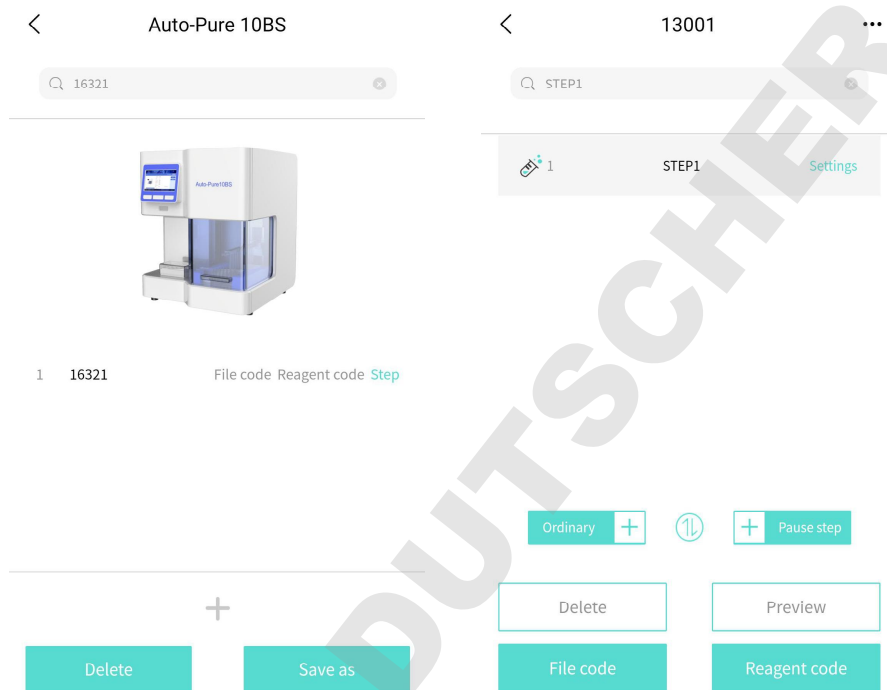


Fig 30

6.2 Instrument Software

6.2.1 Opening Interface

Power on the instrument, the device will go to self-checking interface automatically.



Fig 31

6.2.2 Built-in software

Instrument will go to protocol operation interface, two modes available for this interface: quick display mode and list display mode.

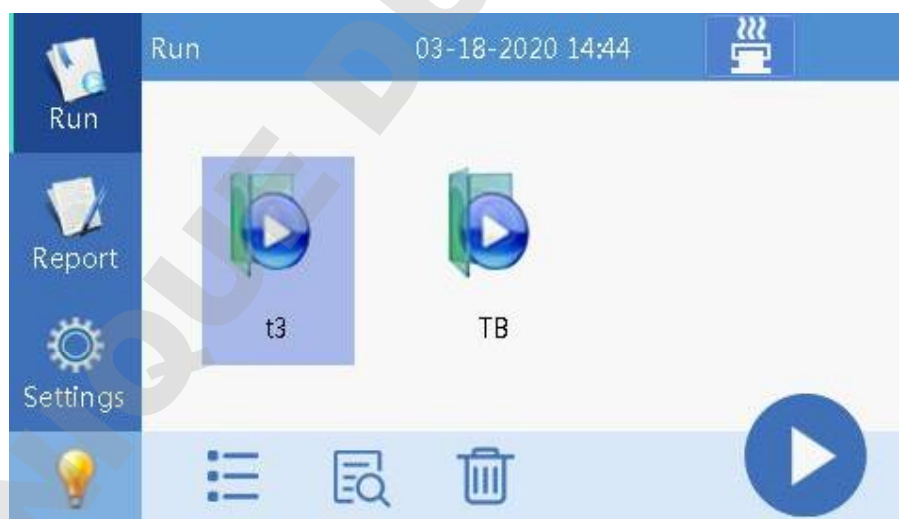


Fig 32

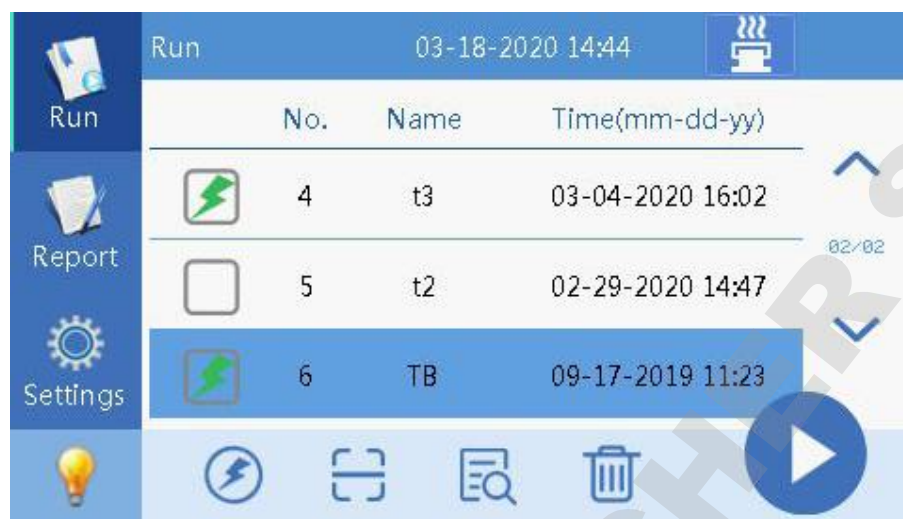


Fig 33

Click “” to preview the selected protocol, see Fig 34.

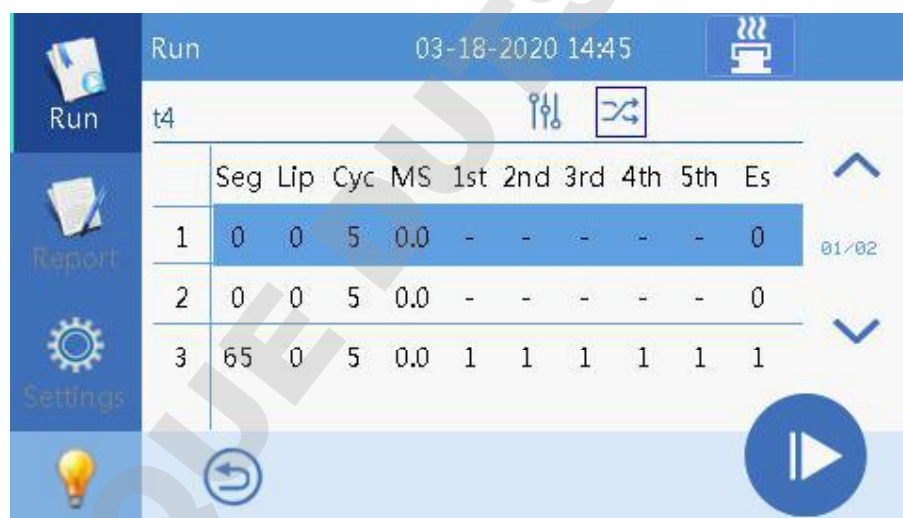


Fig 34

Table 3.

Icon	Meaning
	Delete protocol
	Quick mode, to switch between quick display mode and list display mode
	Scan, for QR code
	Preview, preview protocol or step information
	Run, click to run the selected protocol

6.2.3 Run

Click button "Run" to enter into run interface. If the sample function is on, sample numbers should be input before operation.

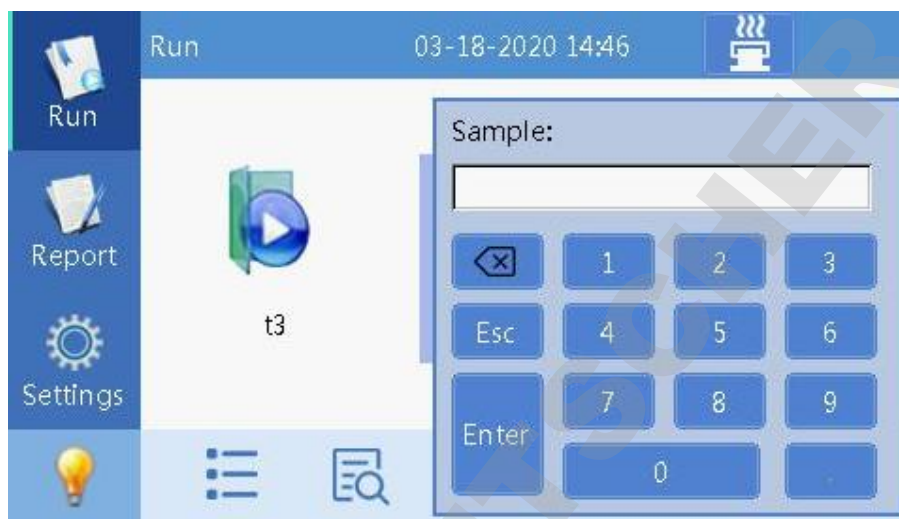


Fig 35

Or if the sample function is off, the device will enter into the operation interface directly.



Fig 36

6.2.4 Report Interface

A running report will be generated and stored automatically for each running,

the report includes protocol name, running time, step information, alarm record and instrument information etc which can be exported. The reports can be stored up to 1000 pcs, and the earliest report will be covered automatically when exceeded 1000.

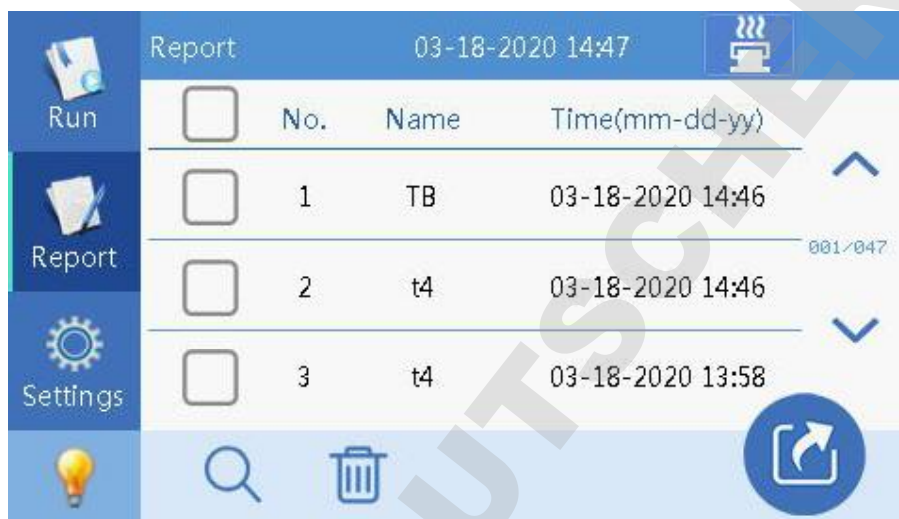


Fig 37

Table 4

Icon	Description
	Delete selected report
	Search a specified report
	Export selected report to USB

6.2.5 Settings interface

Four functions included in: “UV sterilizer”, “Air ejector fan”, “settings” and “Instrument”.

UV sterilizer: the time of sterilization can be set, click start button “” after

finishing the setting to enter into the countdown state, the UV light will be off automatically after finished.

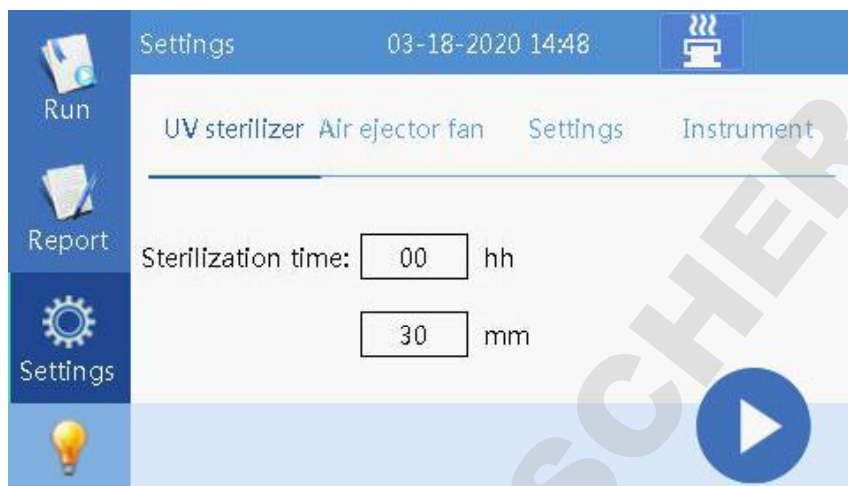


Fig 38

Air ejector fan: users can choose “On” or “Off”.



Fig 39

System Settings includes “Time”, “Language”, “Transfer”, “Log”, “Sample” and “Version”.

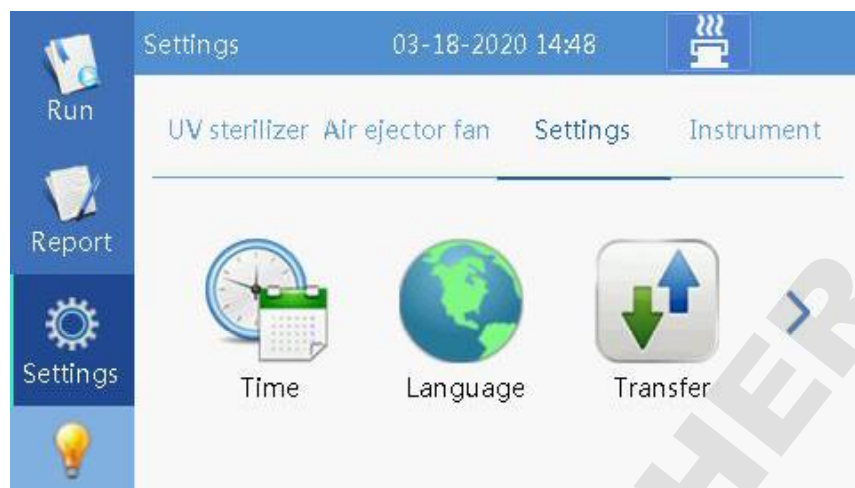


Fig 40

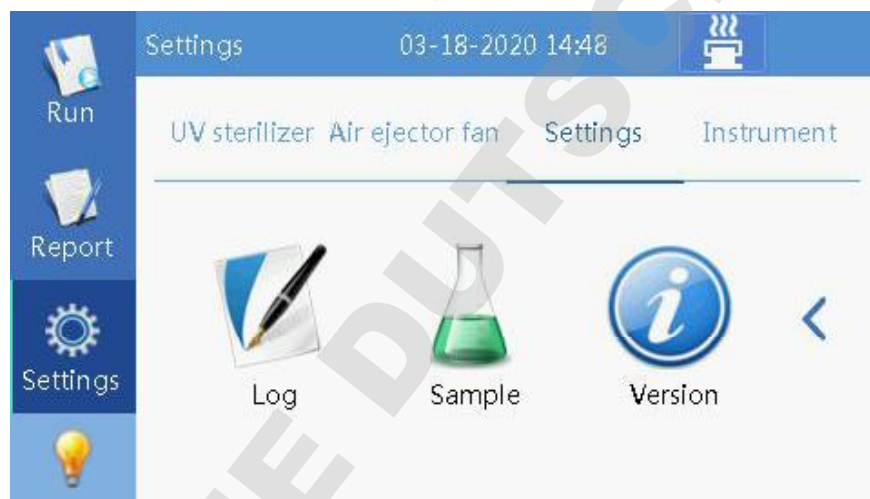


Fig 41

System time setting as below Fig 42.

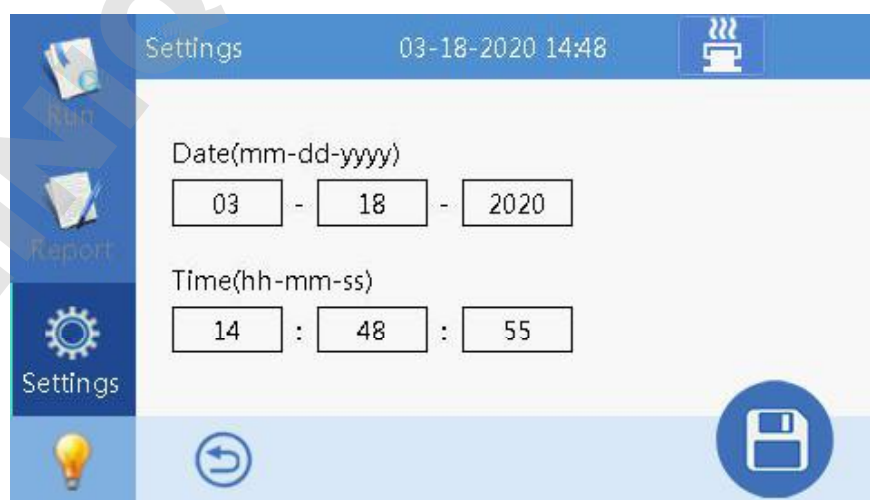


Fig 42

Language setting, Chinese and English are available.



Fig 43

Insert a USB, click “Transfer” can import or export protocols.



Fig 44

Insert a USB, click “Log” to export logs(this function is under developing).



Fig 45

“Sample” also can be “On” or “Off”. Sample numbers need to be entered if turn on the sample function, and also the number will be recorded in the running report.



Fig 46

Maintenance settings only opens to after-sale maintenance personnel, not for end users.

6.2.6 Lamp

Lamp icon “” locates in the lower left corner of each interface, users can turn it on or off at any time.

6.2.7 Incubation Function

This function is available for Auto-Pure 10BS, see the icon “”.



Fig 47

Click the icon  to enter into the incubation interface, shown as below:



Fig 48

The incubation temperature can be set, temperature range is room temp.~105°C. When enable incubation function, the device will start to heat up and keep at the set temperature when finished.

The right is the countdown, click start to enter into countdown state, alarm will appear when finished and the temperature will begin to cool naturally.

The incubation function and nucleic acid extraction function can run independently, they will not interference each other.

chapter Five Trouble Shooting

Fault analysis and treatment method

No.	Trouble	Analysis	Trouble Shooting
1	The display does not work after powering on	Power not connected	Check the power and reconnect
		Switch breakdown	Replace the switch
		Fuse damage	Replace the fuse
		Others	Contact with your distributor or manufacturer
2	UV light doesn't work	UV light failure	Replace the UV light or contact with your distributor or manufacture
3	The lamp doesn't work	The lamp breakdown	Replace the lamp or contact with your distributor or manufacture
6	The heating strip is not working	Sensor damaged	Contact with your distributor or manufacturer
		Heating strip damaged	
7	Instrument not working	Controller damaged	Contact with your distributor or manufacturer
		Motor damaged	
8	Run time sound exception	Wrong installation of guide rail	Contact with your distributor or manufacturer
		Motor damaged	
		Synchronous belt or lead screw wearing	
9	The panel do not work	Front panel damaged	Contact with your distributor or manufacturer

Software fault alarming

No.	Trouble	Error code	Model
1	T1, T2 temperature overheated	E011, E021	Auto-Pure 10B
	T1, T2, T3, T4 temperature overheated	E011, E021, E031, E041	Auto-Pure 16A
	T1, T2, T5 temperature over heat	E011, E021, E051	Auto-Pure 10BS
2	T1, T2 open circuit	E015, E025	Auto-Pure 10B
	T1, T2, T3, T4 open circuit	E015, E025, E035, E045	Auto-Pure 16A
	T1, T2, T5 open circuit	E015, E025, E055	Auto-Pure 10BS
3	T1, T2 short circuit	E016, E026	Auto-Pure 10B
	T1, T2, T3, T4 short circuit	E015, E025, E036, E046	Auto-Pure 16A
	T1, T2, T5 short circuit	E015, E025, E056	Auto-Pure 10BS
4	Horizontal zero sensor damage	E403	All three models
5	Magnetic rod motor zero sensor damaged	E425	All three models
6	Magnetic rod motor zero sensor damaged	E415	All three models
7	Clock crystal vibration damaged	E702	All three models
8	Memory chip E2P damaged, setting parameters lost	E703	All three models
9	Zero calibration parameter error	E711	All three models
10	NAND FLASH Damaged	E704	All three models
11	Online failure	E801	All three models

Chapter Six Packing List

No.	Name	Unit	Qty	Remark
1	Power Line	pcs	1	
2	Mouse	pcs	1	
3	U disk	pcs	1	APP software included

Chapter Seven Acronyms and Marks

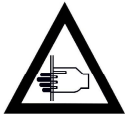
1. Acronyms

For reference only, may appear in the above user manual.

A	Ampere
AC	Alternating Current
V	Volt
Hz	Hertz
W	Watt
USB	Universal Serial Bus
SD	Safety Digital Code
WiFi	Wireless LAN
kg	Kilogram
mm	Micrometer
μL	Microliter
hPa	hectopascal
°C	degree centigrade
CV	Concentration difference between wells
TAB	tabulator key
RUN	Run
STOP	Stop

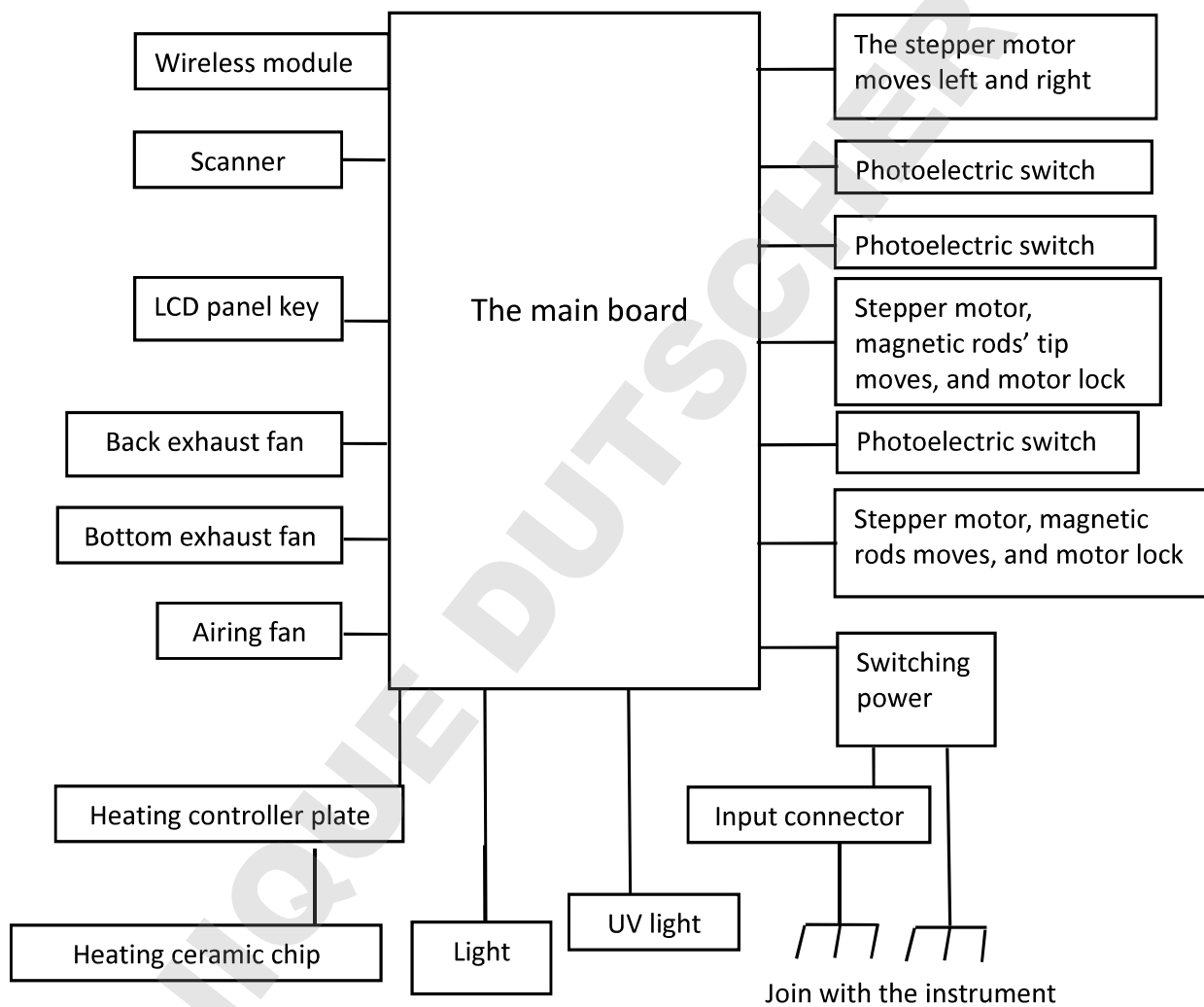
2. Marks

The following marks appear on the device.

	Warning
	Heating
	European standard
	Beware of clamping hand

Appendix: Wiring Diagram

(For reference only, without notification if updated.)



Memo