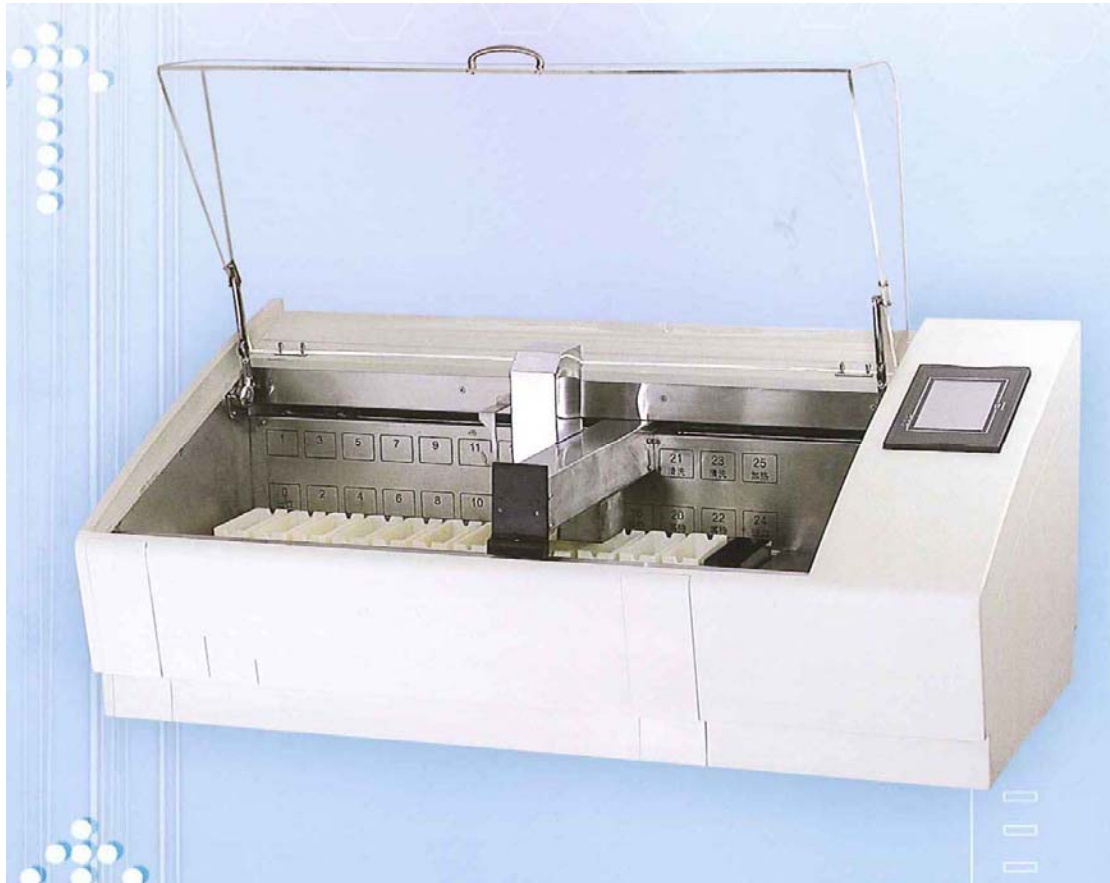


ATS200

Automatic Tissue Stainer

Operation Manual



Read carefully before working the instrument.

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1.Important notes

1.1 Qualification of personnel

- 1) The ATS200 may be operated only by trained laboratory personnel.
- 2) All laboratory personnel designed to operate the ATS200 must read this instruction manual carefully and must familiar with all technical features of the instrument.

1.2 Designed use summarize

The ATS200 Automatic Tissue Stainer is the necessary equipment for pathology work. It has been designed for staining applications in medicine and industry. The instrument may be operated only according to the instructions contained in this manual.

2.Safety warning

2.1 Safety matters

Please read these explicit rules. Act in violation of them can affect normal operation of the equipment, cause damage to the equipment or result in danger.



Use proper nominal supply voltage



The input power supply must have a good ground.



Install away from flammable and explosive objects



Never open instrument without authorization to prevent high voltage shock



Service should be done only by authorized personnel.



Check regularly the parameters showed during operation



Disconnect instrument from power supply after use



Use proper fuses



Use only proper power cord



Install the instrument away from any interference source



Equipment which needs heating must not be heated without liquid

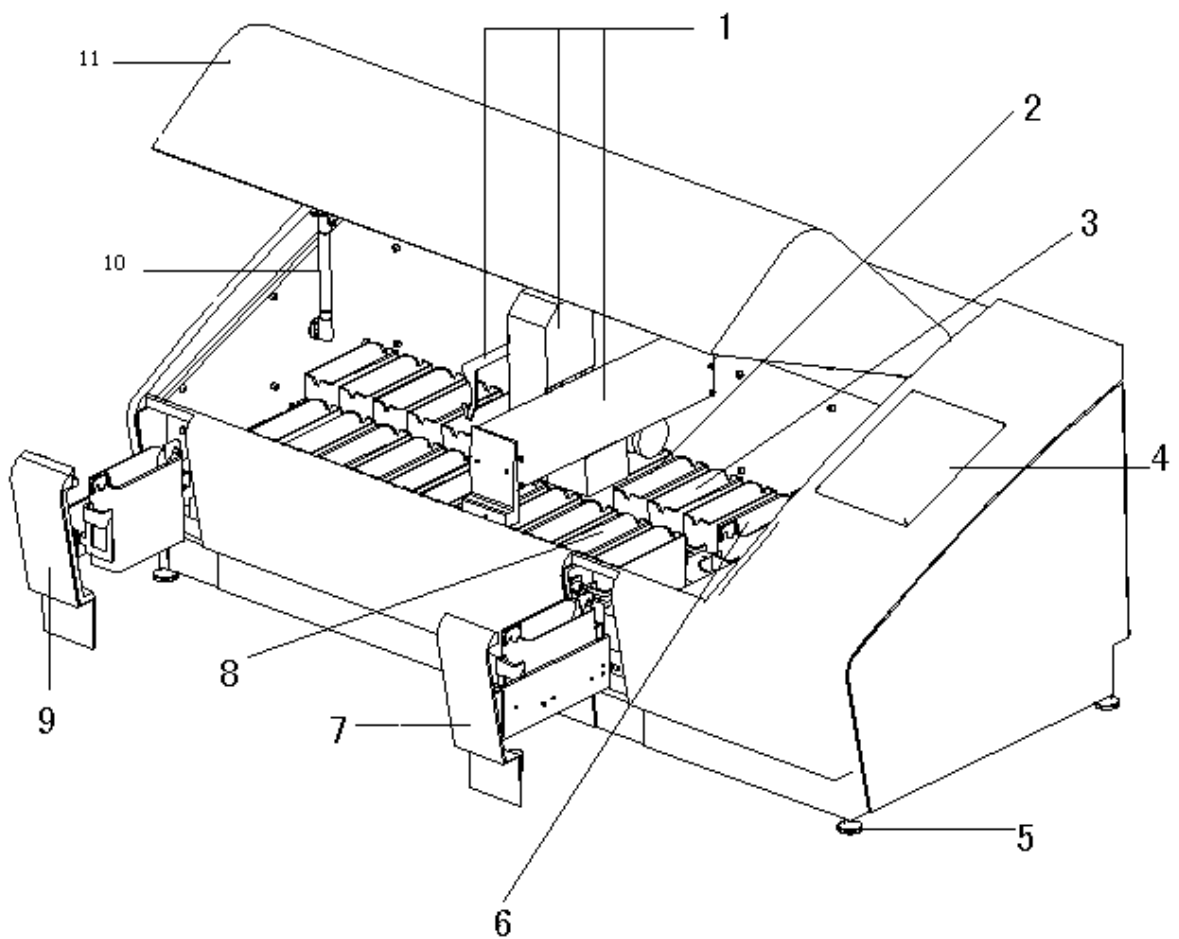
2.2 Installation environment

- (1) More than 20cm of space around the equipment for heat dissipation.

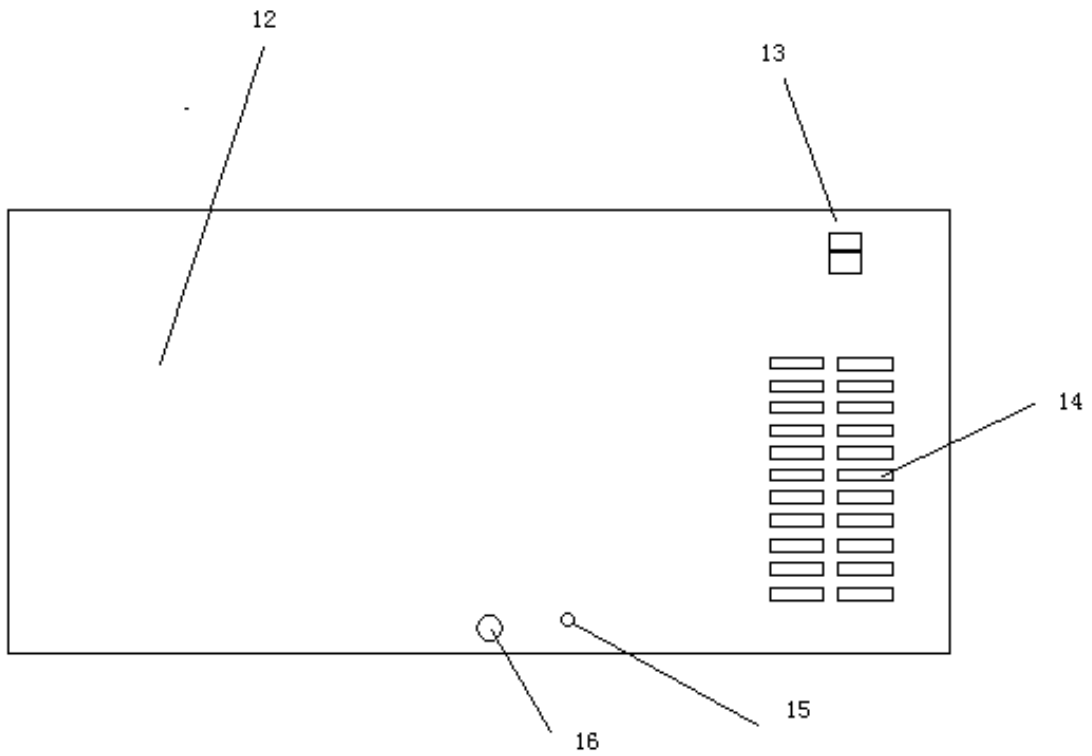
- (2) Free of water-drop, steam, dust(including oily dust and flying dust)
- (3) Free of corrosive, flammable and explosive gas and liquid
- (4) Free of electromagnetic interference
- (5) Ambient temperature and relative humidity at -10°C — 50°C and less than 90% respectively

3. Instrument features

3.1 Overview-----instrument



Front View (Fig. 1)



Rear Panel (Fig. 2)

Front View

1. Transfer mechanism
2. Reagent container
3. Wash stations
4. Touch Screen
5. Feet
6. Oven
7. Load drawer
8. Wait container
9. Exit drawer
10. Lid Spring
11. Glass Cover

Rear Panel

12. Back rear panel
13. Power switch (ON/OFF)

14. Exhaust air duct
15. Water inlet
16. Drain outlet

3.2 Instrument specification

- 1) Adopt PLC control system and Electronic Touch Screen, it's convenient to operation and low failure rate.
- 2) Adopt high performance stepper motor and drive with Synchronous Belt, to ensure the balanced running, accurately fixed position, min. noise and so on.
- 3) Adopt Photoelectric switch to fixed position, it has find position memory and reset automatically functions.
- 4) It can store 5 different programs to meet the different staining requirements.
- 5) Battery backup can be optional, to permit staining of slides to continue during the main power failures.
- 6) It has 26 stations: From 1 to 17 stations are reagent containers, 19, 21, 23 stations are water washing containers, 18, 20, 22 stations are waiting containers that for putting the ready staining racks. 24 station for loading staining rack. 0 station for unloading staining rack. 25 station is oven.

3.3 Technical Data

Specimen slide throughput:	At least 200 specimen slides per hour (depend on the selected program)
Loading capacity:	5 slides rack
Slide rack capacity:	30 specimen slides
Total number of stations:	26
Number reagent stations:	18
Reagent container volume:	600ml

Number of wash stations:	3
Number of wait stations:	3
Oven:	1
Oven chamber temperature:	from ambient temperature to 85°C
Load/unload stations:	1 each
Incubation time setting:	from 0 sec. up to 9999 sec.
Permanent memory capacity:	5 programs, up to 24 program steps each
Operation temperature range:	15°C to 35°C
Relative humidity:	≤90%(+25°C)
Dimension (W×D×H):	120cm×50cm×60cm
Weight:	110Kg
Voltage:	220V, 50Hz
Power rating:	300VA

4. Installation

4.1 Installation site requirement

- 1) No other instruments nearby which might cause vibrations.
- 2) Stable tabletop, enough space far from wall to ensure AST200 normal working.
- 3) Room temperature about between +15°C - 40°C.
- 4) The instrument must be located within three meters of a tap and drain.
- 5) ATS200 requires connection to a laboratory water tap with mains pressure fitting.

4.2 Connect

4.2.1 Connect Power

Connect the Power cord to the Mains power inlet socket (13 (Fig. 2)).

If applicable, then turn on the power switch at the rear panel. The Electronic Touch Screen will be displayed.

Note: The instrument must be connected to an earthed mains power outlet socket only.

4.2.2 Water supply

Connect the water hose to the water inlet at the rear of the unit. Screw the other end of the hose to the cold water tap. Slowly turn the tap on fully.

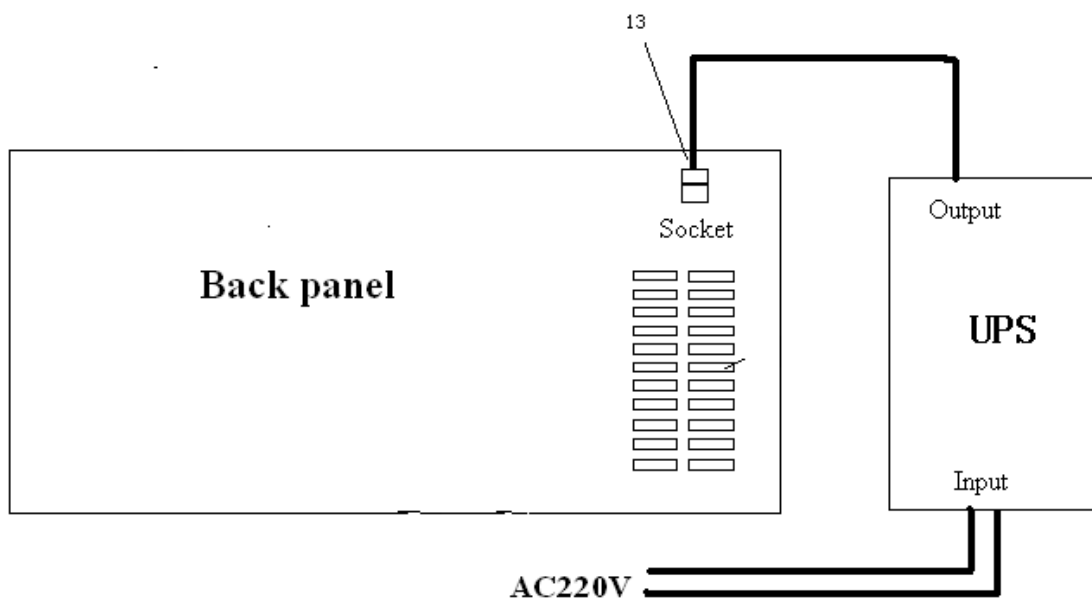
Note: Ensure that the water filter is present when fitting the water inlet hose.

Failure to do so may result in leakage of water.

Drain hose: Connect the $\Phi 6\text{mm}$ drain hose to the drain outlet on the rear of the unit.

4.3 Battery backup---External UPS (Optional)

A small UPS can be connected to the rear of the unit, to permit staining of slides to continue during the main power failures. The connection as shown in following:



Note: 1) The UPS must be rated for use with the local mains power. If necessary, your distributor will can recommend a suitable UPS for you.

2) Heating in the oven will not be maintained by the UPS.

4.4 Oven

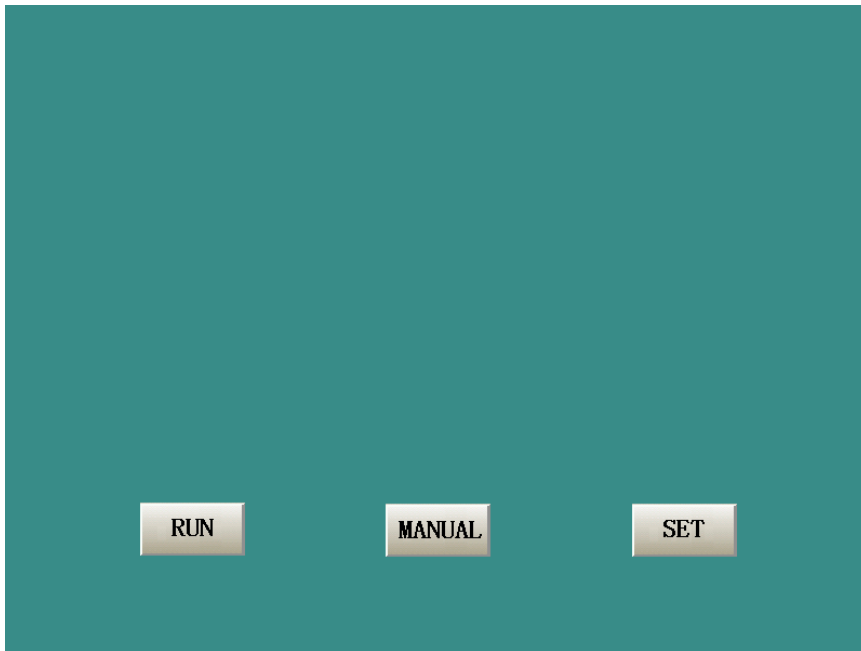
Fit the wax tray into the bottom of the oven.

5. Operation

5.1 Initialize interface

The LCD display our company Zonway information.

5.2 The main menu



- **RUN:** Press this key, to run the program automatically.
- **MANUAL:** Press this key, to run the basket manually.
- **SET:** It for set the executed program.

5.3 Edit a program

ATS200 can store 5 programs numbered from 1 to 5 in permanent memory. All information can be entered from the touch screen.

Press “SET” on the main menu, the system enters to the set interface, the LCD displays as follows.

Serial	TankNo.	ReagentName	StainTime	Exact	Serial	TankNo.	ReagentName	StainTime	Exact
1	24	EnterTank			17				
2					18				
3					19				
4					20				
5					21				
6					22				
7					23				
8					24				
9					25				
10					26				
11					27				
12					28				
13					29				
14					30				
15					31				
16					32				

Exit Tank Pro. No. Name Save

- Serial: Step number
- Tank No.: the run tank step by step. The 24th tank is enter tank that can't be set.
- Reagent Name: Each tank fill reagent name.
- Stain time: The basket stay in the tank time as you need.
- Exact: Exact time. Because there are 5 baskets can run together. So if run some baskets together, it will happen that maybe at the same, the arm need pick up two baskets together. So now the arm will according to which was set "Exact" to decide that first will go to pick up which basket. For example: if the basket can't stay in xylene too long time, so need choose the "Exact". So during running if any conflict, it will pick up this basket first.
- Pro. No.: Set the program number. Totally it can set 5 sets program.
- Name: Set the program name, as Program 1...

Set Desire program:

1) On the Set display, press the “Tank” key on the screen. It will display as following:

TankNo.	ReagentName				TankNo.	ReagentName			
0					13				
1					14				
2					15				
3					16				
4					17				
5					18				
6					19				
7					20				
8					21				
9					22				
10					23				
11					24				
12					25				

DroppingTime S DipTimes TempSet °C

2) Set each reagent name from tank No. 1 to 24th.

In each reagent name frame, input the reagent name from this keyboard.

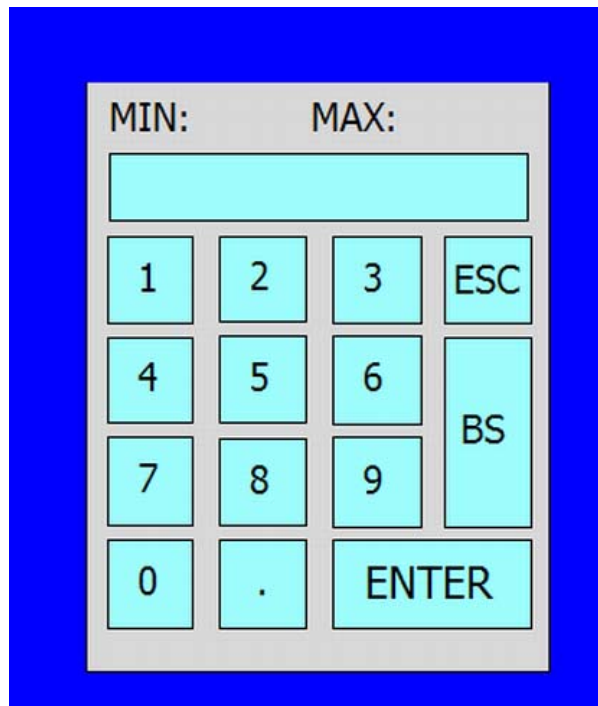




3) Set the following spec.

- Dropping time: The basket stay above tank for dropping the reagent, to avoid dirty.
- Dip times: Set times for the basket.
- Temp. set: Set the tank temperature.

4) Then press “Exit” to back the set first screen. Then on this screen, set the staining time and other details information.



5) After all the information were set well, press “Save” to store the set info,

5.4 Run a program

- 1) Put the basket to the 24th tank, and close the drawer. If the drawer doesn't close well, the unit will be alarm, to remind customer should close the drawer well.

This green sensor for test this drawer whether closes well.



2) Press “Run” on the main menu, the display will show information as following.



3) The arm will also run to the right position of the unit, as following picture shows position.



4) Press "Choose Pro." Key on the screen, and choose the executed program number.

5) Press "Upload" key, to upload the executed program.

6) On the screen, the Program number position will become yellow, and show "Yes" or "No" to confirm. Press "Yes", then the program will start to run.

5.5 Pause a processing program:

Press the key "Pause" on the required basket processing interface to pause the current processing program, now pause all the executing baskets running, now can check the current stain effect. Then press "P/R" key to going on running the steps before pause executed step.

5.6 Stop a processing program:

For a stop a running program:

Press the key "Exit" on the required basket processing interface to stop the current processing program.

5.7 Alarm information

During running the program, if meet any program, the display will show the corresponding alarm fault reason information. So the customer can check where the unit has any problems. So it is convenient to our maintenance service.

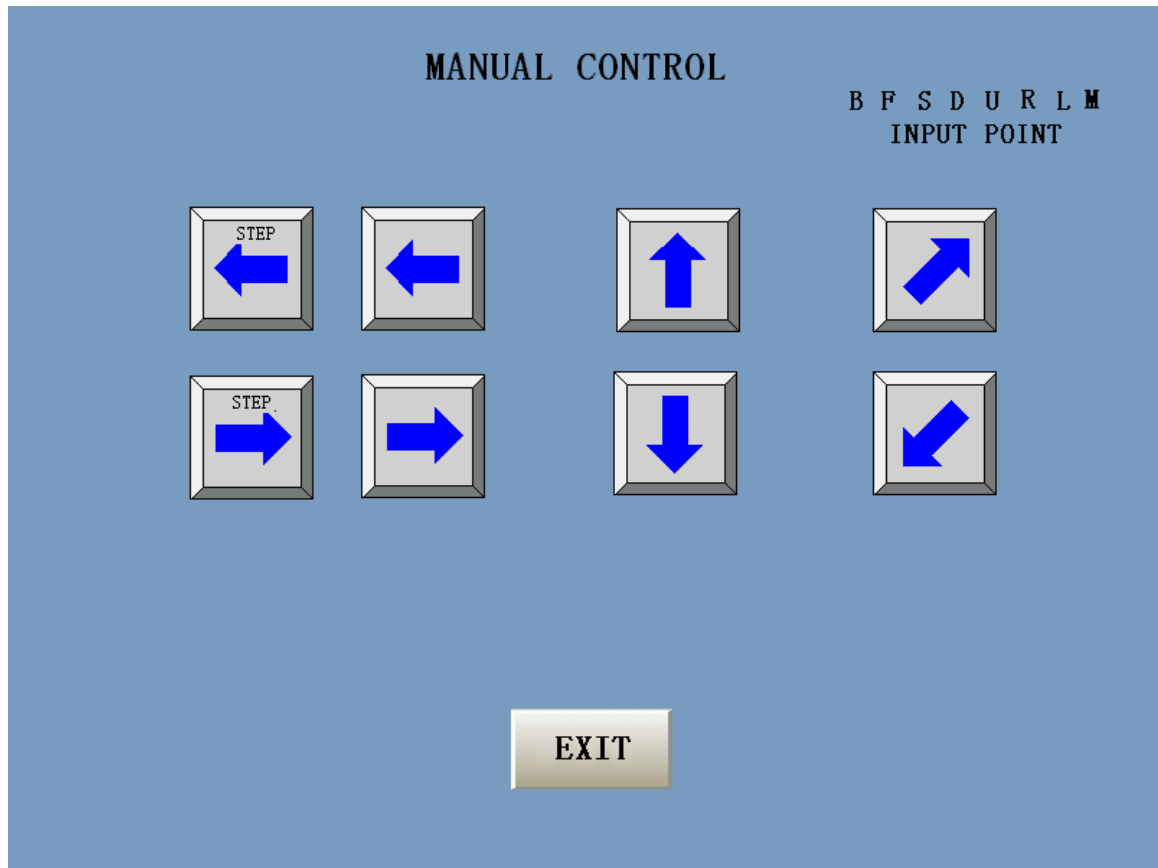
The details alarm information as following:



Left/right run motor trouble, or sensor broken
Up/down run motor trouble, or sensor broken
Temp. sensor trouble
Unload the ending rack
Tanks conflict
Front/back run motor trouble, or sensor broken
Enter tank was drawn out
Exit tank was drawn out

5.8 Run manually

- 1) Press “MANUAL” on the screen, it will enter the manual run interface as the following shows.
- 2) As you want, you can press the position arrow, the arm will start to run step by step.



5.9 Staining

5.9.1 Reagent containers

Reagent containers can be individually removed for filling. For use, fill the reagent containers to the inside 450ml capacity and place into position in the instrument consistent with the programs you wish to run.

This is an area for a label on the end of containers just above the handle pivots.

The container map inside the instrument defines the station number as shown the following picture. Ensure that the reagent containers are correctly seated and that the handles are over to the side and will not obstruct slide rack movement. Lids are provided reduce evaporation while the reagent containers are not in use.



The Load and Exit drawer container can be filled with a reagent if desired. However the instrument will not control the immersion time in these station.

5.9.2 Wash system

The wash system consists of three wash stations each capable of holding one slide rack. Water enters from the instrument base and exits from the overflow lips at the top left handle edge.

To use the wash system, slowly turn the laboratory tap on fully. The flow control valve in ATS200 will limit the total water flow in the wash station to 8 liters/minute.

5.9.3 Loading slide rack

Slide racks are inserted into the instrument via the load drawer only, situated at the front right hand side of the instrument. To operate the drawer, grasp and push up with several fingers on the release lever on the underside of the drawer and pull outwards.

Remark:

- ① While the Loading station has rack inside, other racks will stay in the wait containers to wait.
- ② During staining, if one reagent container is using by the before rack, the later rack will enter to the wait containers to wait. While before rack left, it will go on running the staining program.

5.9.4 Unloading racks from the exit drawer

When a rack is in the exit station, it will alarm to remind customer to take away the rack which stay in the exit drawer.

6. Cleaning and maintenance

6.1 Cleaning the instrument

Clean interior stainless steel surface with detergent and rinse with water. Clean with head covers by wiping with a damp cloth.

Wipe the control panel carefully with a damp cloth.

Note: Don't use liquids directly on the sensitive electronic components. Wipe clean only.

Avoid the use of solvents on exterior surface and especially on the control panel.

6.2 Wash water containers

Remove the water container and clean with detergent.

6.3 Wash reagent containers

Wash the reagent containers in warm water with detergent.

6.4 Wash Slide racks

Wash slide racks clean with detergent or laboratory cleaning agents as required.

6.5 Wash oven

Periodically check the wax tray at the bottom of the oven and clean it if excessive wax dripping has occurred.

7. Troubleshooting

Trouble		Reason & Solve
LCD Display shows nothing	If inside fan works	The fuse is damaged
		The power supply socket doesn't connect well.
	If inside fan doesn't work	The switch power is damaged
		LCD display is damaged
The rack transfer arm has stalled during operation.		Reagent container not properly seated.
		Handle not properly positioned.
		Lid not properly seated on the reagent container.
		Slide rack bent.
The oven can't be heat		Check the temperature display value. If it is 99°C, the temperature sensor is damaged.
		The PLC control board is damaged.
The oven temperature can't be controlled.		Check the temperature display value. If it is 0°C, the temperature sensor is damaged.

	The PLC control board is damaged.
Program can't be used for staining.	Program parameters are empty.
The basket arm can't be left-right move in transverse.	The Servo motor driver and the PC board connection wire is loosen or disconnection.
	The Servo motor overload, check whether has any obstruction on the basket arm running way.
	The PLC control board is damaged.
	The Servo motor is damaged.
The basket can't upward-downward and forward-backward move.	The fuse is broken.
	The transformer is broken.
	The PLC control board is damaged.
The basket can't upward-downward or forward-backward move.	The Step motor driver of upward-downward or forward-backward is damaged.
	The Step motor of upward-downward or forward-backward is damaged.
	The PLC control board is damaged.
While cover is opened, staining going on running.	The position sensor is broken beside of the cover.