Labotronics

Tissue Slide Stainer

LB-11TSS

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1. Safety Measures

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

1.1 Safety Matters

Kindly read these explicit rules. Act in violation of them can affect the 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 good ground.
	Install away from flammable and explosive objects
	Never open an instrument without authorization to prevent high-voltage shock
	Service should be done only by authorized personnel.
	Check regularly the parameters shown during the operation.
	Disconnect the instrument from the power supply after use.
	Use proper fuses
	Use Only the proper power cord

	Install the instrument away from any interference source
	Equipment that needs heating must not be heated without liquid

2. Introduction

Tissue Slide Stainer LB-11TSS can hold 24 slides to process multiple samples efficiently in a single run. This automated tissue stainer features 26 stations and utilizes 600ml of reagent for high throughput. Its heating tank temperature ranges from ambient to 85 °C to ensure optimal conditions for different reagents. Our stainer features a user-friendly digital LED touchscreen for easy control and monitoring.

3. Features

1. Programmable settings for customization
2. Photoelectric switch for precise positioning
3. Microprocessor-controlled thermostat for accuracy
4. Stepping motor for smooth operation
5. Customizable staining durations
6. Anti-corrosive structural unit

4. Specifications

Model No	**LB-11TSS**
Specimen slides capacity	24
Number of loading racks	5
Slide rack capacity	30
Total number stations	26
Reagent container volume	600 mL
Number of wash stations	3
Number of wait stations	3
Heating tank temperature range	Ambient to 85 °C
Running mode	Continuous loading and unloading
Tank time	0 to 9999 sec
Permanent memory capacity	8 programs up to 32 steps each
Power supply	AC110-220V, 50-60 Hz
Dimensions	920 × 250 × 260 mm
Weight	110 kgs

5. Applications

Tissue Slide Stainer is widely used to automate the staining of peripheral blood and other hematologic smears across cytology, histology, immunology, microbiology, biotechnology, fisheries, research & medical institutes, pharmaceuticals, etc.

6. Instrument Introduction

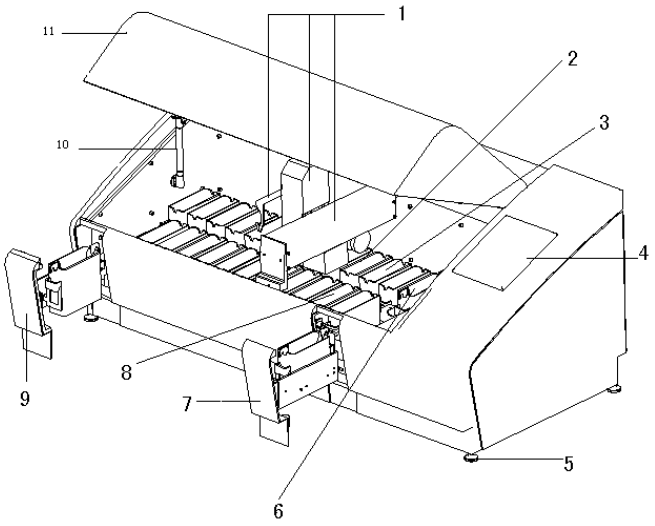
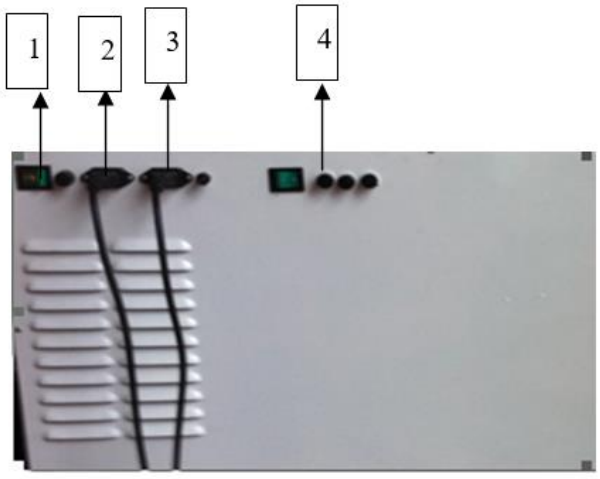


Figure-1 Front View

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



1) Machine power switch
2) Machine power socket
3) Heater switch
4) Heater power sockets

Figure-2

7. Installation

7.1 Installation Environment

1) More than 20cm of space around the equipment for heat dissipation.
2) Free of water, steam, and 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□—50□ and less than 90% respectively.

7.2 Installation Location Requirements and Installation

7.2.1 Notes on Startup

When the machine is turned on for the first time, the engineer may open the rear cover according to the actual situation to adjust the balance of the machine.

7.2.2 Location Requirements

- The dyeing machine needs a stable platform with a length of 1200mm and a depth of 650mm. The instrument must be positioned within three meters of the water source and the drainage.
- Water hose required for dyeing machine: 3A: 240V

Warning: The switch selector setting cannot be changed by the user; the dyeing machine needs to be connected to the laboratory hose with a pressure-resistant fitting.

7.2.3 Connect

There are two power jacks on the back of the device:
Mains power input
heating power

Warning 1: The instrument must be connected to a main outlet with a ground terminal.

How to boot

1) Turn on the power switch on the main power outlet on the wall.
2) Turn the **ON/OFF** switch on the back of the instrument to the **ON** position.

The instrument will beep once, and then the screen will display the Main Menu. When the instrument is not in use, turn the **ON/OFF** switch on the back of the instrument to the **OFF** position.

7.2.4 Water Source

- Connect the water pipe to the water inlet on the back of the instrument, fasten the other end of the water pipe to the cold-water hose with a 3/4-inch BSP connector, and slowly turn the water hose switch to the set position.
- **Drainpipe**: Connect the drainpipe to the discharge outlet on the back of the instrument. Loosen the nut clip, cover the drainpipe rotate it to a certain position, and then tighten the clamp again. Make sure that the drainpipe is placed horizontally and put the end of the pipe below the bottom plane of the instrument. inside the drain container, make sure water does not soak into the tube, shorten the drain tube, and tighten if necessary.

- 3 There is a heating fan unit on the side of the drying oven.
- Turn on the heating switch of the rear cover when the machine is turned on and turn off the heating switch after the program is finished.

8. Operations

8.1 Communication

The dyeing machine communicates via the control panel and associated indicator lights and sound signals.

8.2 Control panel

The control panel is an LCD touch display.
The display is an LCD touchscreen with a bright background.
Caution: The touchscreen may be damaged using sharp tools or excessive force if exposed to solvents.

8.3 Main menu

When the **ON/OFF** switch is turned **ON**, the main menu appears on the dyer display and a beep sounds.

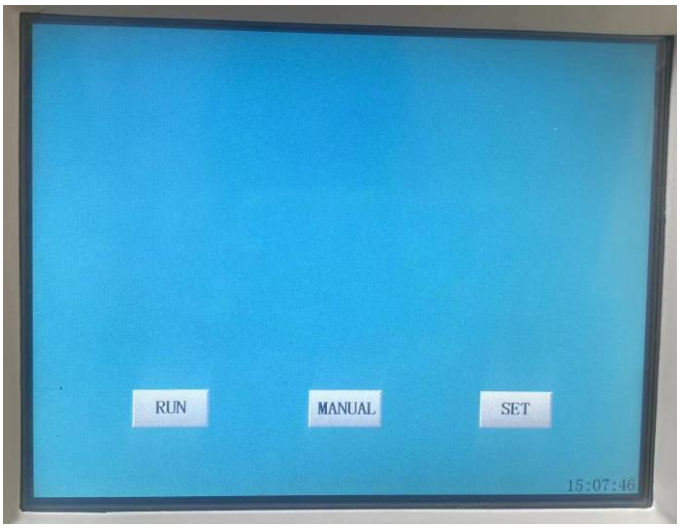


Figure-3

1) Run, enter dyeing operation interface
2) Manual and machine debugging
3) Set, set the program state

8.4 Setup Button Overview

Click the Setup button

Figure-4

This set of procedures includes two steps:

1) **Step 1: Cylinder setting**
   To edit the cylinder, click the cylinder Settings to enter the following

Figure-5

- **Cylinder number:** Indicates the cylinder number
- **Reagent name:** The name of the reagent placed in the cylinder
- **Times:** The maximum number of times of immersion. If the value exceeds the above value, an alarm will be given to change the reagent
- **Number of days:** The maximum number of days of use. If the value exceeds the above value, the reagent will be replaced with an alarm

- **Drip time:** The jitter time of the motor
- **Times of immersion:** Up and down movement times of hanging basket
- **Temperature setting:** Temperature setting of heating cylinder

Set the reagent name for each cylinder.

Click the reagent name to set the reagent name in the corresponding working cylinder, as shown below

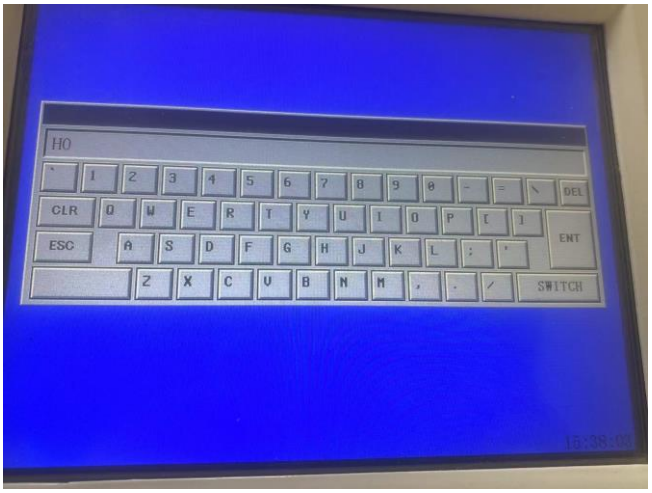


Figure-6

2) Step 2: Program Setup

Figure-7

A program can have up to 32 steps, some of which can be left blank. Each step contains the following information:

1) **Serial number:** Serial number.
2) **Cylinder Number:** Dyeing cylinder number. Enter 99 to clear all subsequent steps.
3) **Reagent name**: Reagent name in the tank.

4) **Immersion time:** Refers to the time when the glass basket is completely immersed in a dyeing VAT. Modify time: for example, at 1:00, click minute can be set to minute, and click second can be set to second.
5) **Accurate time:** When there is more than one glass basket in the instrument, there may be a timing conflict. The step requiring accurate time (1~10 seconds) should be given priority in the procedure and accurate to ±1 second.
6) **Return:** The main screen is displayed. (**Note:** Kindly press the save button after each modification).
7) **Cylinder setting:** Kindly refer to the first step of cylinder setting for operation.
8) **Program number:** The dyeing machine can store 5 programs, numbered from 1 to 5, each program name can be customized.
9) **Save**: Press the save button after each change

Note: if the last step is not the outlet cylinder, the hanging basket is saved to the waiting cylinder.

8.5 Program Runs

Click "**Run**" to enter the dyeing operation steps:

Figure-8

Operation procedure: Pull the cylinder (imported cylinder) into the hanging basket, select the program, click upload, and then press **OK**.

Display Mode (1)

Figure-9

Represents total time/countdown

Represents the number of programs/program name

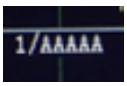
Represents the step sequence/cylinder number/countdown interval

The white line represents the run point

Display Mode (2)

Figure-10

Represents total time/countdown



Represents the number of programs/program name

Indicates the step sequence/cylinder number/Set time/Actual and expected time

The white line represents the run point

End of program: The hanging basket will enter the no. 0 outlet cylinder and give an alarm sound, and the display screen will download. First, take out the hanging basket and then click Download. (**Note:** The inlet/outlet cylinder must be closed, otherwise there will be a buzzer).

8.6 Water system

After the water source is connected, water will be injected automatically, and water will be withdrawn automatically when the program runs.

8.7 Reagent container

The reagent container can be removed individually for reagent filling. When in use, fill the reagent container to an internal scale (450ml capacity) and place the container in the instrument in a position consistent with the program you are running. The inside of the instrument is marked with the container number to ensure the correct positioning of the reagent container. Cover reagent containers when not in use to reduce volatilization.

8.8 Dyeing Procedure Reference

Serial	TankNo.	ReagentName	StainTime	Exact	Serial	TankNo.	ReagentName	StainTime	Exact
1	24	EnterTank			17	16	1%EOSIN	0:20	✓
2	19	WATER	3:00		18	7	95%ALCOHOL	0:20	
3	21	WATER	1:00		19	9	95%ALCOHOL	0:20	
4	23	WATER	1:00		20	11	ALCOHOL1	1:00	
5	2	ALCOHOL	1:00	✓	21	1	HO	1:00	
6	4	95%ALCOHOL	1:00		22	3	XYLENE2	1:00	
7	6	80%ALCOHOL	1:30		23	25	HEAT	1:00	
8	8	70%ALCOHOL	1:00		24	0	EXIT	1:00	
9	19	WATER	0:20		25				
10	10	HEMATOXYLI	1:20		26				
11	19	WATER	2:00		27				
12	12	0.5%HC1	0:03	✓	28				
13	19	WATER	0:20		29				
14	14	LITHIUM	0:10	✓	30				
15	19	WATER	1:20		31				
16	6	80%ALCOHOL	1:00		32				

Figure-11

8.9 Cylinder Setting

TankNo.	ReagentName	DropT			TankNo.	ReagentName	DropT		
0	EXIT	0			13	ALCOHOL2	5		
1	HO	1			14	LITHIUM	5		
2	ALCOHOL	5			15	ALCOHOL3	5		
3	XYLENE2	5			16	1%EOSIN	5		
4	95%ALCOHOL	5			17	EMPTY	5		
5	XYLENE3	5			18	EMPTY	0		
6	80%ALCOHOL	5			19	WATER	5		
7	95%ALCOHOL	5			20	EMPTY	0		
8	70%ALCOHOL	5			21	WATER	5		
9	95%ALCOHOL	5			22	EMPTY	0		
10	HEMATOXYLI	5			23	WATER	5		
11	ALCOHOL1	5			24	ENTRY			
12	0.5%HC1	5			25	HEAT			

Figure-12

9. Maintenance

9.1 Cleaning System

After the water source is connected, water will be injected automatically, and water will be withdrawn automatically when the program runs. Each cylinder can be placed in a glass basket, water from the bottom into the cleaning cylinder, and out of the right side of the top overflow.
Note 1: There is a locating pin at the bottom of the cleaning cylinder, which can only be inserted in one direction.
Note 2: Use careful force when installing or removing the cylinder, as excessive force can damage the seal. Wet the "O" ring before installing a cylinder.
When using the cleaning system, slowly turn on the laboratory water hose to the set water flow and to an optimal flow position (adjust the water flow according to the cleaning requirements).
Note: If the water flow is at a low flow rate for any reason, the cleaning time specified in the program may have to be extended.

Loading glass slide basket:

The sliding basket can only be inserted into the instrument through the loading drawer located on the front right of the instrument. Load the slide basket and slowly pull the drawer out.

9.2 To load slide basket.

Note: If the instrument is processing a slide basket, there will be a time delay before the slide basket begins processing.
Unload the slide basket from the exit drawer
When there is a sliding basket in the exit drawer, there will be a beeping alert, a screen, and a download mark.
A slide basket is to be unloaded from the exit drawer.

1) Carefully open and exit the drawer and remove the glass basket. Take out the whole reagent container from the drawer and replace it with another one.
2) Close the drawer, press the "download" mark on the screen, then the beep will be relieved.

9.3 Clean

Instrument clean

- Clean internal stainless-steel surfaces with detergent and rinse with water.
- Wipe the mechanical head plate with a wet cloth.

Warning: The mechanical head contains sensitive electronic components. Do not use liquid to clean the area directly. Only use a cloth to wipe the head.

- Emissions system 50% acid solution washing is available, and to avoid the growth of microorganisms, if you are using this solution, to extend the life of the instrument, no metal can have the residual solution, after use must rinse well with water, instrument surface (paint) available mild washing agent to clean, use wet cloth to wipe.

Note:

- Avoid using solvents on the outer surface of the instrument, especially on the control panel and cover.
- Carefully wipe the control panel with a damp cloth.
- Rinse containers
- Remove the rinse container and clean it with detergent.
- The reagent containers
- Rinse with warm water with detergent.

Warning:

- Do not use an automatic cleaner to clean reagent containers or to clean containers.
- Use detergent or laboratory reagents as needed.

10. Troubleshooting

10.1 Error Warning

If a small error occurs during the dyeing process, the instrument will first attempt to correct it. If unsuccessful, an error message will be given, and the instrument will wait for the user to correct the problem.
Some errors cause alarms to go off.
In the process of operation, the motion stops, and the main reasons for the problems are as follows:

1) Improper hook position.

- The hook may be misaligned or deformed due to impact. If this happens:
- Correct the hook position.
- If the mechanical head still doesn't move electrically after the correction, remove any obstructions blocking movement and continue the dyeing process.
- If the outlet tube at the back of the instrument is blocked, remove the blockage to restore function.

2) Faulty Oven

If the oven is not functioning properly, it will need to be repaired.
The instrument can still operate at all other workstations but slide drying must be carried out outside the instrument until the oven is repaired.

10.2 Notification Information and Warnings

1) **Dyeing Process Warnings**
If the procedure number is empty, the dyeing cylinder number is set to 0, and the time is 0, the machine will send the hanging basket directly to the exit, ending the entire dyeing process.

2) **Drawer Safety**

- The loading drawer must be closed before the instrument lifts the glass basket.
- The exit drawer must be closed before placing a slide basket in the exit drawer.