

# **TEC 2800** Version: (AMOSTEC2800ECOP20240406)

# **Embedding Center (LCD)**

# **Operation Manual**

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## Foreword

Thank you for purchasing our TEC2800 Embedding Dispensing Console. Presented in this 《 Operation Manual 》 are the functions and operation method of the Embedding Center and the matters needing attention concerning safety. Please read this manual carefully before use to understand its performance better and make full use of the functions. If you have any questions, feel free to contact us for assistance, we will provide you with satisfactory service at any time.

Please keep this Operation Manual appropriately for future reference.

## Contents

Safety Notes1
1.1 Safety Matters 1
1.2 Installation Environment1
1.3 Delivery Inspection
Characteristics & Scope of Application
2.1 Scope of Application
2.2 Characteristics
Safety Regulations
Overview- Instrument Components3
Fechnical Specification
Operation4
6.1 Keyboard Function & Instruction 4
6.2 Operation Instruction
6.2.1 Time Setting
6.2.2 Checking and Setting Temperature for Working Platform
6.2.3 Scheduled Heating On and Off7
6.2.4 Manually setting Heating Mode and Standby Mode
6.2.5 The Use of Peltier cold spot
6.2.6 Finger Touchpad/Foot Pedal to control paraffin flow
6.2.7 Light on/off and adjusting brightness9
6.2.8 The Use of Magnifier
Trouble Shooting
Cleaning & Maintenance12
8.1 Cleaning the Equipment
8.2 Maintenance
Instrument Diagram 13



## 1. Safety Notes

### **1.1 Safety Matters**

Please read these explicit rules. Act in violation of them can disrupt the normal operation of the equipment, cause damage to the equipment or pose safety hazards.

- Use 220VAC±10% at 50HZ or 110VAC±10% at 60HZ.
  The input power supply must have good earthing.
  The equipment should be installed away from flammables and explosives.
  Don't open the equipment unauthorized to avoid the risk of high voltage shock.
  Only professional maintenance personnel are allowed to repair this product.
  Use fuses with correct capacity.
  Ensure sockets and lines have double the equipment's current capacity.
  The equipment should be installed far away from any interference source.
  - ◆Electrical Protection Ratings: I class, B type

◆ Baleful liquid Leak-in proof degree: Normal (enclosed equipment without liquid leak-in proof)

**•**Working system: Continuous running

#### **1.2 Installation Environment**

- More than 20cm of space around the equipment for heat dissipation.
- Keep away from water droplets, steam, dust, oily dust, and floating dust.
- Avoid corrosive, flammable, and explosive gases or liquids.
- Install on a sturdy, vibration-free countertop.
- Avoid electromagnetic interference.
- Operating environment temperature should be between 5°C and +40°C, with relative humidity below 90% RH.



### **1.3 Delivery Inspection**

Before leaving the factory, all products undergo rigorous quality control inspections. However, during transportation, damage or partial loss of products may occur due to human handling negligence or severe impacts. Therefore:

Please check the contents while unpacking, it should include the equipment, an operation manual, the packing list and accessories.

Please check the nameplate to make sure it is your order.

Check to make sure no damage or loss has occurred during delivery

## 2. Characteristics & Scope of Application

### 2.1 Scope of Application

TEC2800 Embedding Center performs embedding of animal, plant and human body tissue which has been processed and paraffin treated, to used for later microtome section, histology diagnosis and research. It is suitable to be used in medical institutions for tissue embedding before pathological analysis.

#### **2.2** Characteristics

- AC110V/220V, with six route heating and Temperature control system.
- Electromagnetic valve controls paraffin flow via finger touch pad or foot pedal operation.
- Peltier cold spot is designed.

## 3. Safety Regulations

European Union Committee In Vitro Diagnostic Medical Devices Directive IVDD (98/79/EC)



## 4. Overview- Instrument Components

- 1) Forceps holder
- 2) Embedding table
- 3) Left chamber
- 4) Right chamber
- 5) Switch for flow out
- 6) Paraffin tank
- 7) Display panel
- 8) Flow Regulating knob
- 9) Peltier Cold Spot
- 10) Switch for cold spot
- 11) Power supply
- 12) Left Paraffin waste Drawer
- 13) Right Paraffin waste Drawer



## 5. Technical Specification

 ○Capacity : Paraffin reservoir: 6Lt Cassettes/molds chamber: 1.4Lt
 ○Working temperature (increments 1°C): Paraffin Tank: from ambient to 90°C

> Cassettes/molds chamber: from ambient to 90°C Working table: from ambient to 90°C Peltier cold spot: from ambient to -5°C Forceps Holder: 65°C constant

⊙Rated Power :: 1200 W

 $\odot$  Voltage/Frequency: AC 220V 50Hz or AC 110V 60Hz

⊙Fuse: 220V/8A (110V/15A)

⊙Dimensions: 560mm(Width)×640mm(Depth)×400mm(Height)

⊙Weight: about 26Kg



# 6. Operation

## 6.1 Keyboard Function & Instruction



1: After setting the startup time and date as shown in Figure 2, press the Cycle button 🔘 . The left side of the LCD display will show flashing icons representing the paraffin tank, left/right chambers, paraffin tube, valve, and working platform. Correspondingly, the selected object's temperature will be displayed.



#### **Function of Indicator Light**

The system is always in one of two states: heating or standby mode. When the red light is on, it indicates that the system is in heating mode. When the green light is on, it indicates that the system is in standby mode.

Keyboard Function

- Heating/Standby button: toggles between the system's heating and standby modes.
- Cycle button: Used to cycle through various objects, such as time display, temperature display, weekday display, and graphical representations of different components.



- Temperature setting button.
- Timer for heating or standby button.
- **1** Increase button: Used to increase time, date, and temperature settings.
- Decrease button: Used to decrease time, date, and temperature settings.
- Turning on the lamp/ increase brightness (details see 6.2.7)
  - Turning off the lamp/ decrease brightness (details see 6.2.7)

### **6.2 Operation Instruction**

### 6.2.1 Time Setting

①Connect to power and switch on the embedding machine (See Fig. 1, Page 2)

▲ Attention: Ensure the power supply voltage matches the specified voltage on the instrument nameplate to avoid damaging the internal power system.

Time at start up and days of the week



<sup>(2)</sup> Pressing the Increase/Decrease buttons (+ -) allows you to set the time and day (as indicated by the arrow pointing to 5 in Fig. 4, representing Friday). Pressing  $\bigcirc$ , the Cycle button enables you to switch between the clock, minutes, and day of the week objects.



▲ 1. The device features a memory function for time and date. Once you set the time and date, even if you disconnect the external power supply and restart the device, there's no need to reset the time and date.

2. If there is no action in 5 secs, it will automatically exit the time setting interface and enter normal working condition. You can manually force exit by pressing the Heating/Standby bottom **\*** to start working. Time cannot be set during working conditions.

#### 6.2.2 Checking and Setting Temperature for Working Platform

#### Check the temperature of working platform

"In normal operation, flashing icons on the left side of the LCD screen indicate the actual temperature of the corresponding working area. For example, if the paraffin tank icon flashes, the actual temperature of the paraffin tank is displayed (Details see 6.1).

Please press O to switch between and check the actual temperature of paraffin tank, left/right chamber, paraffin tube/electromagnetic valve and working platform.

#### Setting temperature for working platform

#### Set the temperature for paraffin tank

\* In normal operating mode, press (L); temperature display values will have a white background, indicating 'selected'

- \* Press 🔘 to select the specific position (paraffin tank)
- \* Set the desired temperature value using (+)

\* Press ቤ to exit.



## 6.2.3 Scheduled Heating On and Off

Set automatic heating time and automatic sleep time for each day of the week .

Scheduled heating and standby



- \* Press 👩 to select the subject: Hour, Minute, day of the week, Heating, Standby.
- \* Set the desired automatic setting time and day of the week using (+) and (-)
- \* Press 🙆 to exit setup.

Fig. 5 displays Monday at 18:03, the system will schedule heating at that time every week.

**Attention:** When the "moon" icon appears , it indicates automatic standby time setting is on When the "heating" icon appears *mailed*, it indicates automatic heating time setting is on

Time 00:00 is the key point of the heating/standby controls.

When the automatic heating time is set at 00:00 for one day, it means the automatic mode will not be active that day.

For example, if the operator is not planning to use the equipment on Sunday, it can be set to 'automatic heating time as 00:00'

Once set with automatic heating time (not 00:00), the equipment will start to heat up on set time. Once set with automatic sleep time (not 00:00), the instrument will start to standby on set time.

For instance, if you need to set the instrument's working hours to be from 8:00 to 16:00 every day, with standby mode on Saturdays and Sundays, you would set the standby mode at 00:00 for those days.

Set as the following:

**TEC2800** Embedding Center



Monday, set 8: 00 for Automatic heating;	Standby at 16:00
Tuesday, set 8: 00 for Automatic heating;	Standby at 16:00
Wednesday, set 8: 00 for Automatic heating;	Standby at 16:00
Thursday, set 8: 00 for Automatic heating;	Standby at 16:00
Friday, set 8: 00 for Automatic heating;	Standby at 16:00
Saturday, set 00: 00 for Automatic heating;	Standby at any time
Sunday, set 00: 00 for Automatic heating;	Standby at any time

### 6.2.4 Manually setting Heating Mode and Standby Mode

Turn on the machine and enter into the working interface, press (5) to set for heating mode or sleep mode manually.

After the heating or standby mode has been set (refer to 6.2.3), you may adjust for heating or standby mode with (%) at any time.

### 6.2.5 The Use of Peltier cold spot

Switch on the peltier cold spot (See Fig. 1) to start cooling. The temperature will reach a value between  $0^{\circ}$ C and  $-5^{\circ}$ C in two minutes. This function is designed for the users with stainless-steel embedding molds.

## 6.2.6 Finger Touchpad/Foot Pedal to control paraffin flow

Preparation work before paraffin flows

■ Wax melting requires a long time. It's better to start working after the wax is completely melted to avoid potential damage to the electromagnetic valve, which controls the paraffin flow out.

Clear the wax inside the paraffin tube before usage. The best way is to hold the switch of flowing out for 2-3 seconds to help clear the wax.

The paraffin flow rate can be adjusted. Operation: Rotate the flow adjusting knob manually to adjust the rate of flow.

#### Finger touch pad

■ Lightly push the manual paraffin release switch located behind the paraffin outlet with your finger (you'll hear a clicking sound), and paraffin will flow out. Release the switch to stop.

#### Foot pedal

■ Insert the plug of the foot pedal (Fig. 6) into the socket on the back of the instrument.

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Lightly step on this pedal to release paraffin. Release to stop the flow of paraffin.



## 6.2.7 Light on/off and adjusting brightness

1. The default brightness of the machine's illumination light is the dimmest. Press vot to turn it off, and vot to turn it on.

2. If user wish to adjust the brightness, please follow the following instruction:

**PRESS** an **Simultaneous** while starting the instrument until the selection interface appears. Increase brightness by holding , decrease by holding **S**.

### 6.2.8 The Use of Magnifier

Remove the knob indicated by the red arrow in the diagram and install the magnifying glass at the indicated position. Adjust the angle of the magnifying glass, and it will be ready for use.



Fig.	7

Fig. 8	
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# 7. Trouble Shooting

Problem	Issued	Reason	Evaluation methods	Corrective action
LCD is not working well	LCD is unlit	Power supply not connected	Connect the power	Connect the power
		Fuse open circuit	Take out the fuse to check its internal resistance by multimeter, if the value is infinite, the fuse is blown	Replace a new one
		12V power supply is damaged	Check its output by multimeter DC gear. If no output with 12V, the power supply is broken	Replace a new one
		7805VR-tube no output	Check its output by multimeter DC gear. If no output with 5V, the 7805 is broken	Replace a new 7805
	The LCD screen displays a blue screen with no image	Crystal oscillator is damaged	Check its output waveform by oscilloscope, no waveform means the crystal oscillator is broken. Or check the voltage of both end of Crystal oscillator, if the voltage than half of what's normal, it is broken	Replace a new one
		Chip MSP149 is	All function is out of order, the chip is	Replace a new
		damaged LCD Screen is damaged	damaged Change to a new one, if the display is well, it was an LCD problem	MSP149 Replace a new LCD
Buzzer L beeps E	LCD display E1 or E2	certain solid-state relay on MSP430F147 board is broken	Put 5V power on the control port of solid-state relay, if it is out of control, the solid-state relay is broken	Replace a new solid-state relay
		Temperature sensor is faulty	Connect a new sensor to terminal to start machine, if all is fine, it means the sensor is faulty	Check the faulty sensor by multimeter and replace a new one.
Working area is not heating	no heating at paraffin tank, working platform, paraffin tube, left/right chamber	Heating film broken	Check the output resistance of heating parts by multimeter, if open circuit, it means the heating film is broken	Replace a new heating film
		Temperature setting error	Check each positions' temperature value	Reset the value
No Paraffin flows out from the	Pipeline don't heat up	Pipeline's heating wire burns out or electromagnetism valve's	Check the output resistance of heating parts by multimeter, if open circuit, it means the heating film is broken	Replace a new heating film

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nozzle		heating film is damaged		
		Low temperature cause paraffin not melting in paraffin tubeline.	Check each positions' temperature value	Set higher temperatures for Paraffin tube and electromagnetic valve
Pipeline heat up, but no paraffin flows out.	Electromagnetism Valve out of work, wire burns out	Electromagnetism valve makes no sound, check its wire resistance with multimeter, if open circuit, it means the Electromagnetism valve is broken	Change the Electromagnetism valve wire	
	The flow setting knob was closed		Turn the knob counterclockwise 6-8 circles to open	
	Strainer is blocked or has air bubbles		takes out the strainer to cleaning or expels the air bubble	
The panel shows incorrect time	Displays wrong time	Chip is broken	If it still shows incorrect time after resetting time.	Replace a new chip
Cold spot is unable to cool down	Cold spot is unable to cool down	Peltier is damaged	Check with multimeter, it is broken if it is open circuit.	Replace Peltier
Leak paraffin	Paraffin tank leaks	Rubber ring worn		Replace a new rubber ring
		The paraffin tank has leakage, probably with the welded section		Replace a new paraffin tank
If there are p	roblems that cann	ot be resolved, please contac	et the manufacturer.	

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# 8. Cleaning & Maintenance

## 8.1 Cleaning the Equipment

#### **Ecternal cleaning**

Wipe the equipment's surface with a dry cloth. For frequently handled parts, use a damp cloth. Use a small shovel to clean any residual wax on the wax outlet if necessary, and wipe with a tissue when the wax is still warm.

#### Paraffin tank Cleaning

■ Before replacing with new wax, clean out the old wax. If bubbles appear around the filter, remove them to prevent wax blockage.

#### Left/right chamber Cleaning

■ Left/right chambers are frequently used, so remember to clean their interiors.

#### Switch of flow out and adjustable knob Cleaning

The flow out switch and adjustable knob are often handled, so remember to clean them regularly.



#### Left/Right paraffin drawer cleaning

Residual wax may accumulate inside drawer boxes and should be cleaned regularly.

#### 8.2 Maintenance

#### Paraffin tank maintenance

 $\blacksquare$  Regularly check the paraffin mesh to replace the damaged.

#### **Fuse replaced**

■ Insert the fuse (1) into the fuse socket (2) as it is showed in Fig. 10 And then insert the whole assembly into the larger socket (3).

Attention: Cut off the power supply and pull the plug before changing the fuse. To ensure trouble-free operation, make sure to comply to the operation manual.

Fuse specification: 8A (220V), 15A (110V).



Fig. 10

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## 9. Instrument Diagram



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No	Accessory Name	Qty	Notes
1	Embedding Center	1 set	
2	Power Cord	1pc	
3	Fuse	2pcs	
4	Foot Switch	lpc	
5	Magnifier	1pc	Chrome coating with fixed mount (ZMNB-00-70). Adapter (ZMNB-00-83) Connector (ZMNB-00-84) Bolt: M4*12 Screw:M3*4* 1 pc
6	<b>Operation Manual</b>	1pc	

## Standard accessories list

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