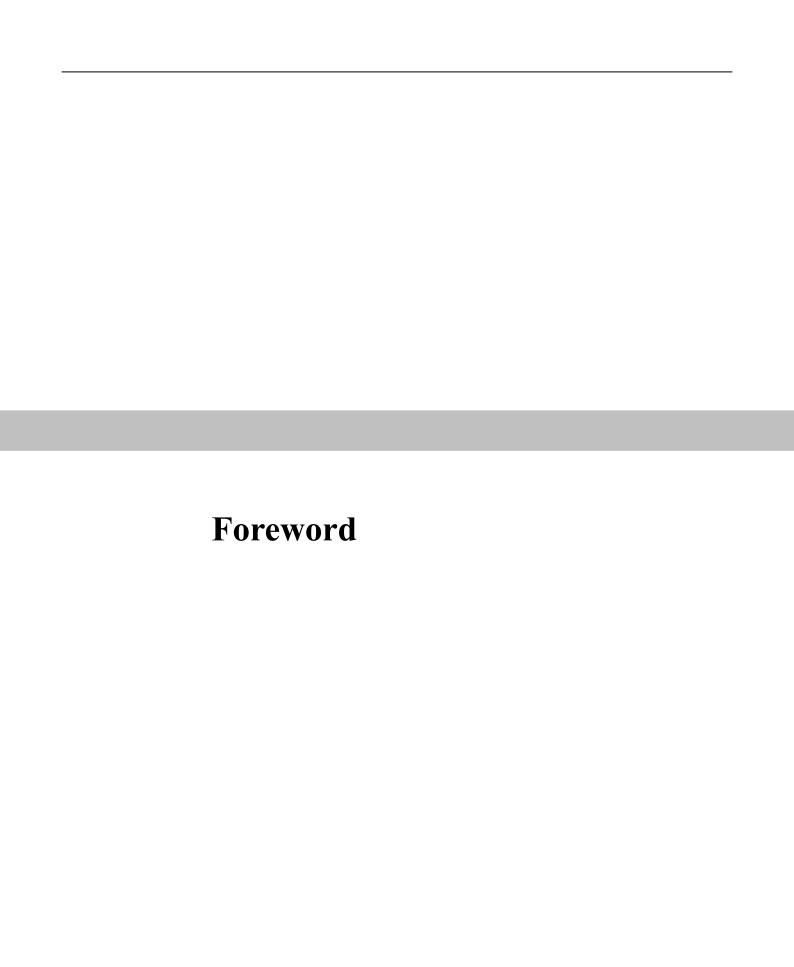


 $AEC~380~{
m (Version: AMOSAEC380ECOP20240409)}$ 

# **Embedding Center**

Operation Manual

www.amos-scientific.com



Thank you for purchasing our AEC380 Embedding Dispensing Console. Presented in this 《Operation Manual》 are the functions and operation methods 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, contact us and we will provide you satisfactory service at any time.

Please keep this 《Operation Manual》 appropriately for future reference.

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# 1. Safety Notes

### 1.1 Safety Matters

Please adhere to these explicit rules. Violation of them can disrupt normal equipment operation, cause equipment damage, or pose safety hazards.



Use either 220VAC±10% at 50Hz or 110VAC±10% at 60Hz power supply.



Ensure a reliable earth connection for the input power supply.



Keep away from flammable and explosive materials.



Don't open the equipment unauthorized to avoid the risk of high voltage shock.

- Only authorized maintenance personnel are permitted to repair the equipment.
- Use fuses with the correct capacity.
- Ensure that power sockets and circuits can handle at least twice the rated current.
- Keep away from any sources of interference.



- Be vigilant for any liquid paraffin leakage. Note: Before delivery, each joint of every internal pipe is confirmed to have no leakage; ensure there is no leakage during installation.
  - ◆ Electrical Protection Ratings: I class, B type
  - ◆ Baleful liquid Leak-in proof degree: Normal (enclosed equipment without liquid leak-in proof)

**◆** Working system: Continuous operation

#### 1.2 Conditions of Installation

- Provide at least 20cm space around the equipment for heat dissipation.
- Avoid exposure to water drops, steam, dust (including greasy and floating dust).
- Keep away from corrosive, flammable, and explosive gases and liquids.
- Maintain stability and minimize vibration.
- Avoid interference from other electromagnetic signals.
- Operating under ambient temperature from 5°C to 40°C, relative humidity below
   90%.

#### 1.3 Delivery Inspection

Product undergoes rigorous quality inspection before leaving the factory. However, damage or missing parts may occur during delivery due to mishandling. Therefore:

- Check contents upon unpacking, including equipment, operation manual, packing list, and accessories.
- Verify the nameplate to confirm it matches your order.
- Ensure no damage or loss has occurred during delivery.

# 2. Performance Features & Range of Application

## 2.1 Range of Application

AEC380 Embedding Center performs embedment of animal, plant and human body tissue which has been processed and paraffin treated. It prepares them for subsequent microtome sectioning, histological diagnosis, and research purposes. This equipment is suitable for use in medical institutions to facilitate tissue embedding for pathological analysis.

#### 2.2 Characteristics

#### User Interface and Automation:

- 1. Easy-to-learn user interface operated via a smart touchscreen.
- 2. Programmed timing with automatic on/off functionality.

#### Modular Design and Paraffin Reservoir:

- The AEC 380-PR Paraffin Reservoir features a modular design, allowing it to connect with one or two sets of AEC 380-M embedding modules based on workload requirements.
- 2. When two sets of AEC 380-M modules are connected, they can be controlled separately by the AEC 380-PR, enabling simultaneous embedding.
- The Paraffin Reservoir has a larger volume, independent wax outlet, and constant temperature control of the solenoid valve, allowing for simultaneous supply of other waxes.

#### Heating System and Operational Features:

- 1. It features more than six heating routes and a precise temperature control system.
- 2. Integration of the embedding module, cold spot, and paraffin trimmer allows for sequential operation.
- 3. Paraffin flow can be released manually or via foot switch through the electromagnetic valve.
- 4. The forceps holder with constant temperature control automatically drains paraffin, effectively removing it from forceps tips.
- 5. The embedding mold tray with constant temperature control melts paraffin adhering to forceps tips and recycles embedding molds.
- 6. Large-capacity tissue tray storage.
- 7. LED light brightness is adjustable, and the position of the magnifier can be flexibly adjusted with a metal hose.
- 8. User-friendly design includes thermal insulating material for operator protection.

# 3. Overview- Equipment Components

AEC 380 Embedding Center is composed of

AEC 380-PR paraffin reservoir and AEC 380-M embedding module.

According to different demands,

an AEC 380-PR paraffin reservoir can connect with 1 unit of AEC 380-M

or 2 units of AEC 380-M.

Take an example of connecting 1 unit of AEC 380-M, the structure is shown as below:

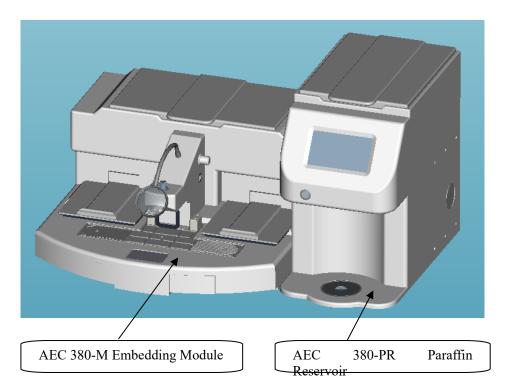
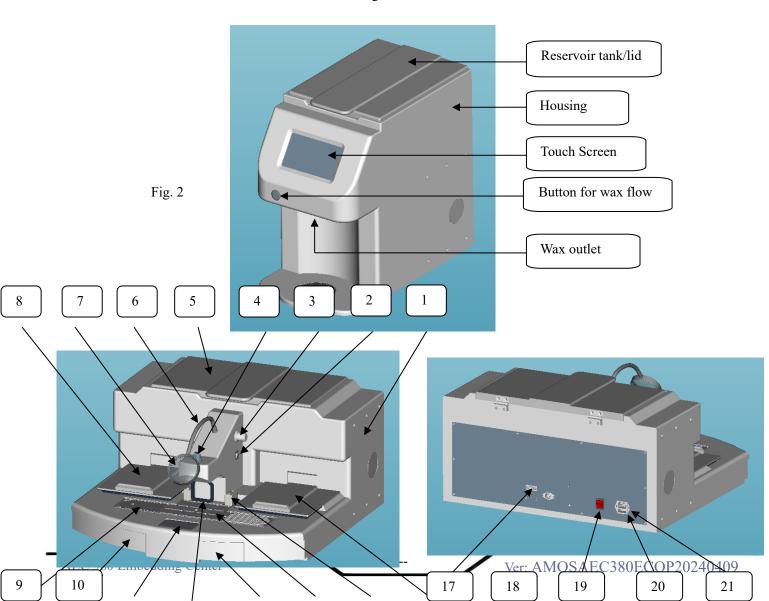


Fig. 1



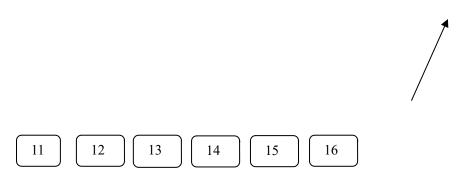


Fig. 3 Fig. 4

Main Unit ON/OFF Cold spot LED adjusting knob Wax flowing Adjusting knob Tissue Tray

Metal hose Magnifier Cover of Tissue Tray Paraffin Trimmer Waste paraffin tray(left) Cold spot Finger touch for wax flow Waste paraffin tray(right) Embedding platform Forceps holder

Storage for Cassette Mold/lid Serial port Foot pedal connector Power switch Power socket Fuse installing hole

# 4. Technical Specification

# 4.1. Combination 1: AEC 380-PR Paraffin Reservoir + one unit of AEC 380-M Embedding Module as figure below:



Fig. 5

#### **Technical parameters**:

- Capacity of Tissue Tray : 150pcs standard cassettes or 1 pc processor basket of AMOS with 100pcs standard cassettes )
- 2. Capacity of Embedding Mold Tray: 400pcs.
- 3. Capacity of Storage Tray : 300pcs standard cassettes or 2 pcs processor basket of AMOS with 100pcs standard cassettes )
- 4. Paraffin reservoir : 10L
- 5. Temperature Range :

Paraffin Reservoir : ambient ~90°C , increment 1°C

Tissue tray : ambient  $\sim 90^{\circ}$ C , increment  $1^{\circ}$ C

Embedding mold tray: ambient ~90°C , increment 1°C

Storage tray: ambient ~90°C , increment 1°C

Working Area : ambient ~90°C , increment 1°C (include Forceps holder and Paraffin Trimmer )

Cold Spot : ambient ~ -5°C

- 6. Maximum flow of wax outlet : 400ML/5 Minute
- 7. Power: < 1350W
- 8. Voltage :  $220V\pm10\%$  50Hz or  $110V\pm10\%$  60Hz
- 9. Dimensions : 920mm×640mm×520mm (L×W×H)

10. Weight : 50Kg about

# 4.2. Combination 2: AEC 380-PR Paraffin Reservoir + 2 units of AEC 380-M Embedding Module as figure below:



Fig. 6

#### **Technical parameters**:

- 1. Capacity of Tissue Tray : 300pcs standard cassettes or 2 pcs processor basket of AMOS with 200pcs standard cassettes )
- 2. Capacity of Embedding Mold Tray: 800pcs
- 3. Capacity of Storage Tray : 600pcs standard cassettes or 4 pcs processor basket of AMOS with 100pcs standard cassettes )

4. Paraffin reservoir : 10L

5. Temperature Range:

Paraffin Reservoir : ambient ~90°C , increment 1°C

Tissue tray : ambient ~90°C , increment 1°C

Embedding mold tray: ambient ~90°C , increment 1°C

Storage tray: ambient ~90°C , increment 1°C

Working Area: ambient ~90°C, increment 1°C (include Forceps holder and Paraffin Trimmer)

Cold Spot : ambient ~ -5°C

6. Maximum flow of wax outlet: 400ML/5 Minute

7. Power : < 2200W

8. Voltage : 220V±10% 50Hz or 110V±10% 60Hz
8. Dimensions : 1540mm×640mm×520mm ( L×W×H )

9. Weight : 80Kg about

## 5. Installation Instruction

AEC 380-PR Paraffin Reservoir and AEC 380-M Embedding Module are packed separately for delivery. Therefore, they need to be combined before use. The required spare parts can refer to the packing list

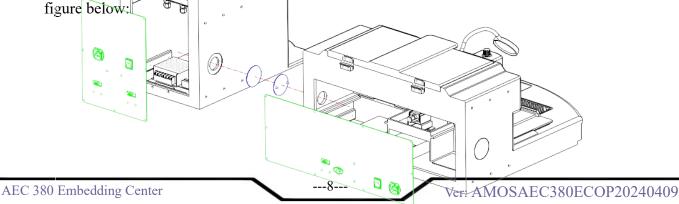
To install the machine, following tools are needed:

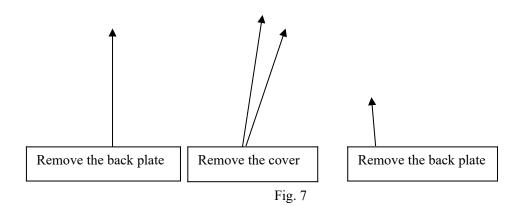
- 1. S3 allen wrench \*1 piece
- 2. S 17 open spanner \*1 piece or two pieces of monkey wrench
- 3. Open spanner size 8
- 4. Wiring screwdriver \*1 piece or cross screwdriver \*1 piece.

#### **Installation steps:**

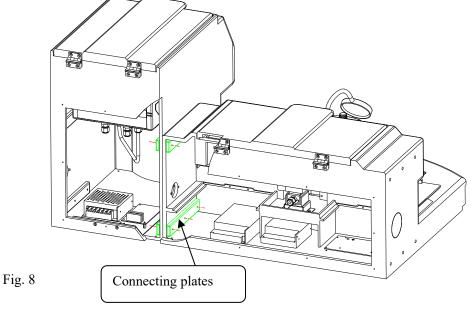
1. Put AEC 380-PR and AEC 380-M on the working table, showing the back to the installer. If AEC 380-PR only needs to connect with one embedding module, it can be put on the left or right according to user's habit. It is placed on the left side as default (from the front view);

2. Remove the covers on the contacting sides of the paraffin reservoir and the embedding module. Remove the back plates of the embedding module and the paraffin reservoir as shown in the





3. Align the six holes on the side of the paraffin reservoir with those on the side of the embedding module, and then secure them together using six pieces of M6 hex bolts and four connecting plates, as depicted in the figure below:



4. Remove one of the connecting pipes equipped in the embedding module unit (two connecting pipes are suitable for the installation of the body on the left side and the body on the right side respectively). Figure 9 below shows the connecting pipes used then the body is installed on the left side.

locking nut connected

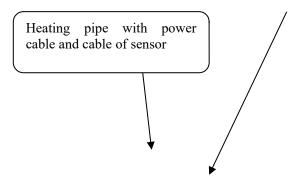
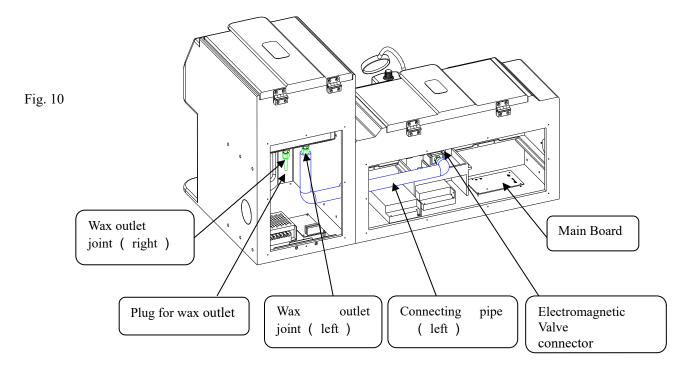
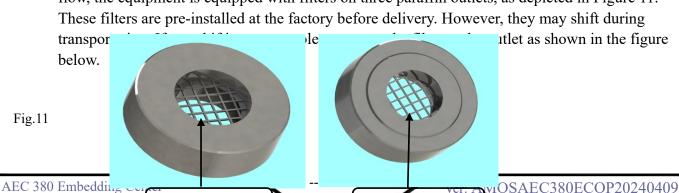


Fig. 9

Install the left connecting pipe between the left wax outlet joint and the electromagnetic valve connector. Ensure a reliable connection when installing the wax outlet plug on the right wax outlet joint. If the embedding module is on the right side, install the right connecting pipe between the right wax outlet joint and the electromagnetic valve connector, and install the wax outlet plug on the left wax outlet joint. Finally, connect the power supply and temperature sensor wiring to the embedding main board following the wiring diagram details, as depicted in Figure 10.



To prevent impurities in the paraffin from clogging the magnetic valve and causing abnormal flow, the equipment is equipped with filters on three paraffin outlets, as depicted in Figure 11. These filters are pre-installed at the factory before delivery. However, they may shift during



This face up

This face down

- 7. Once the pipe connection is complete, start the machine and test it with real paraffin. After the paraffin has melted, inspect the equipment for any leaks at the connections and outlets. If any leaks are detected, tighten the nuts until there are no more leaks. Then, turn off the equipment, unplug the power cord, and proceed to the next step.
- 8. Reinstall the back plate of the paraffin reservoir that was removed in step 2.
- 9. Connect the ends of the data cable to the paraffin reservoir and embedding module. Plug the two power cables into the corresponding sockets of the power supply and the foot pedal. The installation is now complete.

# 6. Operation

#### 6.1 Touch screen Functions & Instruction

Connect the power cable to the power supply and turn on the equipment. The "Amos" logo will appear, and after 2 seconds, it will automatically enter the control interface. The following pages provide an introduction to the control interface of combination 2 as an example. (The operation of combination 1 is similar to combination 2).

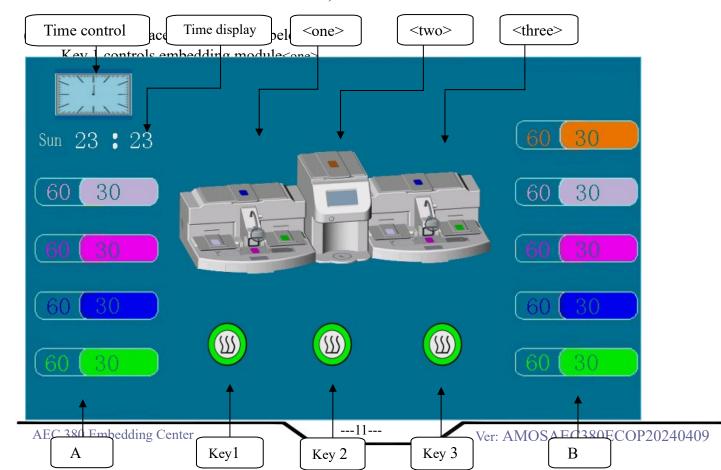
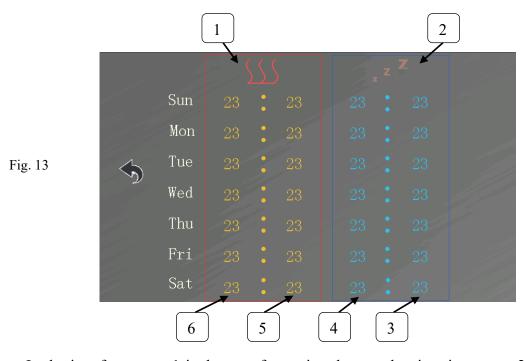


Fig. 12

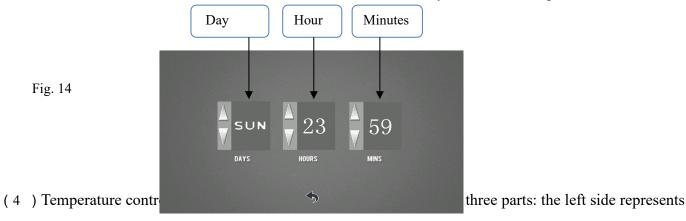
( 2 ) Time Setting: Click on the time control to enter the heating time setting interface. Here, you can set the start time for heating and the sleep time for heating for each day of the week, as shown in Figure 13.



In the interface, zone 1 is the area for setting the start heating time, zone 2 is for setting the end heating time. Zone 3 is for minute setting of heating OFF, zone 4 is for hour setting of heating OFF, zone 5 is for minute setting of heating ON, and zone 6 is for hour setting of heating ON. The left side of the interface shows the days of the week.

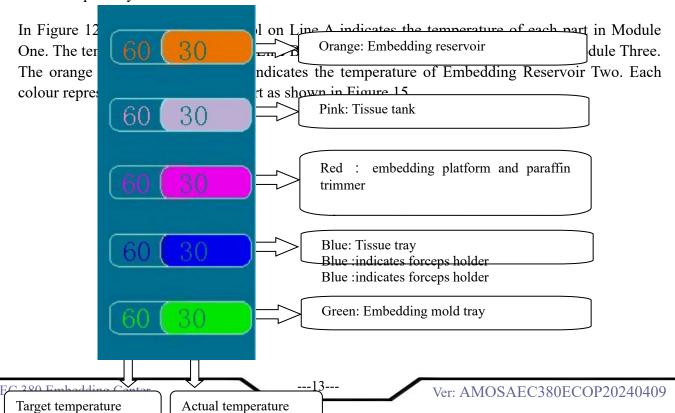
To set a starting and finishing time for a day's work, click on the corresponding figures and input the desired value in the pop-up keyboard, then click "Enter" to save this setting. If a day doesn't require operation, set "0" for all starting and finishing times for that day. After setting up the time, click on the black arrow to return to the main control interface.

(3) Time display: In Figure 12, the real-time is displayed under the clock (top left corner). The weekday is on the left, followed by two numbers indicating the hour and minute in the 24-hour time system, respectively. Click on the time display to enter the time setting interface as shown in Figure 14. The up arrow indicates "+", and the down arrow indicates "-". Set the desired value by clicking the up or down arrow to increase or decrease the current value to the target. After completion, click the black arrow below to return to the main control interface where you can see the updated real-time.



the target temperature, with the default unit being °C. The colour of the bar corresponds to the area

of the equipment controlled by the temperature bar, while the right side indicates the actual temperature. To change the target temperature, click on the left side and input the desired temperature value in the pop-up keyboard. Then click "enter" on the bottom right corner, and the target temperature will be updated. If an embedding reservoir is connected to two embedding modules, the temperature control bars on the sides of the touch screen control each embedding module separately.



(5) Temperature Control of Internal Pipeline and Electromagnetic Valve: Click on areas <one>, <two>, and <three> in Figure 12 to access the temperature control interface of the pipeline and electromagnetic valve. This interface allows you to set and display the temperature control parameters of the paraffin reservoir and the embedding center, as illustrated in Fig 16.

When the lock icon at the bottom right ("temperature display and setting switch") is open after clicking, you can adjust the temperature setting of each part. When the lock icon is closed, this interface only displays the set temperature and the actual temperature of the part.

To change the setting temperature, first unlock by clicking on the "temperature display and setting switch," then click on the corresponding setting temperature number. A pop-up input keyboard will appear, allowing you to input the desired temperature value. Press the "Enter" key to confirm the temperature setting.

Click the return button to go back to the main interface.

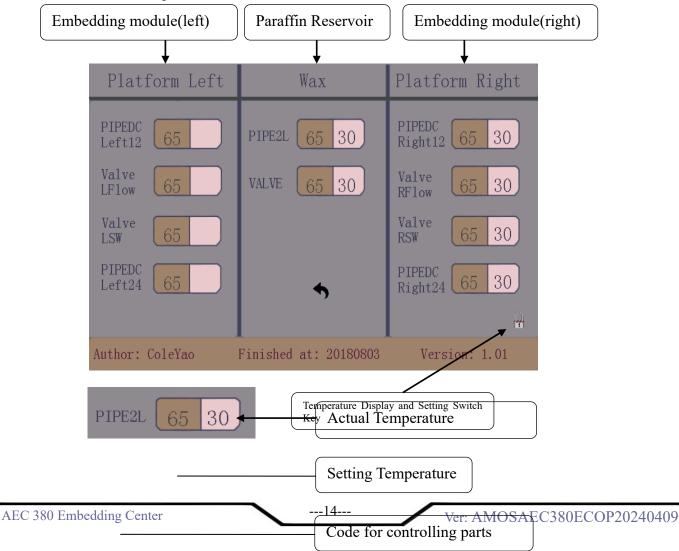




Fig. 16

# **6.2 Operation Instruction**

## 6.2.1 Setting up for time

- Connect the machine to the power supply and switch on the paraffin reservoir and embedding module. Follow the instructions in section 6.1 to set the current time as shown in picture 17. The machine automatically remembers the time and date. Once set, it does not need to be reset after the machine restarts, even if the external power supply is turned off.
- ▲ Attention: Ensure that the voltage matches what is indicated on the nameplate to prevent damage to the electrical system.

## 6.2.2 Checking and Setting temperature for Working area

• Check the temperature for each part using the temperature control bar. If adjustments are needed, click on the corresponding position, input the desired value in the pop-up keyboard, and click "enter".

■ Please refer to the temperature setting details in section 4 for more information.

## 6.2.3 Scheduled heating on and off

■ Click on the time control icon in the operation interface. A pop-up interface, as shown in Fig 13, will allow you to set the time to start and turn off heating. When the automatic heating time is set to 00:00 for a day, it means that automatic heating will not be activated on that day.

#### 6.2.4 Usage of the tissue tray

The tissue tray is utilized for temporary storage of processed tissue awaiting embedding. Please ensure that the paraffin inside is of sufficient quantity. The reference standard is that the liquid level should not be lower than the height of the basket (50mm). Maintain cleanliness of the paraffin to safeguard tissue from contamination.

### 6.2.5 Usage of the embedding mold tray

■ The embedding mold tray with constant temperature is utilized to store embedding molds. The molds placed inside can assist in melting residual paraffin for recycling purposes. Please ensure to clean the paraffin from the tray after each embedding work session.

### 6.2.6 Usage of finger touch and foot pedal for wax release

Preparation work before paraffin flows:

- Wax melting requires waiting time. It's advisable to begin work only after the wax is completely melted to prevent potential damage to the electromagnetic valve, which controls the paraffin flow.
- Clear any residual wax inside the paraffin tube before usage. This can be achieved by holding the flow-out switch for 2-3 seconds to assist in clearing the wax.
- The paraffin flow rate can be adjusted manually. To do so, rotate the flow adjusting knob to adjust the rate of flow.

#### Finger touchpad

• Gently push the switch located at the rear of the paraffin discharge port until you hear a tick sound. This will initiate the flow of molten paraffin. Release your finger to stop the flow.

#### **Foot Pedal**

■ Insert the plug of the foot pedal into the socket located at the rear side.

After the paraffin has melted, gently step on the pedal to initiate the flow of molten paraffin.

When the pedal is released, the flow of paraffin will stop.



Fig. 17

#### 6.2.7 Usage of the forceps holder

The forceps holder features a wax drain hole and controlled heating functionality. Melts wax residue on forceps quickly, ensuring clean forceps for subsequent embedding work.

## 6.2.8 Usage of the LED light

■ Rotate the adjusting knob to turn on/off or adjust the brightness of the LED light.

## 6.2.9 Usage of the Magnifier

Attach the magnifier to the flexible metal tube and screw it in place. Adjust the angle and position of the magnifier as needed before use.

## 6.2.10 Usage of the cold spot

■ Turn on the switch of the cold spot (Refer to Figure 3). It cools down and reaches the required operating temperature (typically -5°C to 0°C) within 2 minutes. Designed for users

who use stainless embedding molds. The cold spot can be turned off when not needed.

### 6.2.11 Usage of the paraffin trimmer

■ When the paraffin trimmer is in operation, place the cassette containing excess paraffin near the trench area of the trimmer and slide it at a certain angle. The excess paraffin will be melted and removed, draining into the waste wax tray. The paraffin trimmer is situated on both sides of the embedding platform and can be operated with either the left or right hand.

#### 6.2.12 Usage of the waste wax tray

■ The waste wax tray is primarily utilized to collect wax residue from the paraffin trimmer, forceps holder, and embedding platform. Ensure the tray is properly inserted before powering on the equipment. Clean out the waste wax after embedding tasks to prevent overflow due to excessive accumulation.

#### 6.2.13 Shutdown

After completing embedding operations, deactivate the cold spot and LED light using their respective switches and knobs. Next, tap on the switches of the embedding module and paraffin reservoir on their touch screens to put the equipment into standby mode. Finally, switch off the power switches and disconnect the power cable from the sockets. If the device is configured with timed heating and sleep functions, avoid turning off the power switches or unplugging them.

# 7. Trouble Shooting

Туре	Problem	Possible causes	Evaluation methods	Corrective
LCD is not working	LCD display not functioning	Power supply not connected	Ensure the power is connected	Connect the power
well		Fuse blown	Remove the fuse and check its internal resistance with a multimeter. If the value is infinite, replace the fuse	Replace with a new fuse
		5V power supply failure	Check the output using a multimeter in DC mode. If there is no 5V output, replace the power supply	Replace with a new power
		Stabilivolt has no output	Check the output using a multimeter in DC mode. If there is no 3.3V output, replace the stabilivolt	Replace with a new stabilivolt
	The display temperature does not	LCD screen and motherboard have poor communication	Check if the communication cable is open circuit using a multimeter. If so, try with a new cable	Replace with a new cable
Buzzer beeps	LCD displays E2	A certain solid-state relay on the motherboard is faulty, causing the heating to remain on, showing E2	Check the control port of the solid- state relay with a multimeter. If it is malfunctioning, replace the solid- state relay	Replace with a new solid-state relay
	LCD displays E1	Sensor is faulty or has poor contact, showing E1	Connect a new sensor to the terminal to start the machine. If all is fine, the sensor is broken	Replace a new sensor

Working area is not heating	No heating at various locations	Heating element malfunction	Check the output resistance of heating elements using a multimeter.  If open circuit, replace the heating element	Replace with a new heating element
		Temperature setting error	Check the temperature values of each position	Reset the temperature values
No paraffin flows out from paraffin outlet	Pipeline doesn't heat up	Pipeline's heating wire burns out or electromagnetism valve's heating film damage	Check the output resistance of heating parts by multimeter, if open circuit, it means the heating film is broken	Replace a new heating film
Туре	Problem	Possible causes	Evaluation methods	Corrective
No paraffin flows out from	Pipeline doesn't heat up	Insufficient temperature causes paraffin not to melt in the paraffin pipeline	Check the temperature values for the paraffin tube and electromagnetic valve	Set higher temperatures if necessary
paraffin outlet	Pipeline heats up, but no paraffin flows out.	Electromagnetic valve not functioning, wire burnt out	Inspect the wire resistance of the electromagnetic valve using a multimeter. If open circuit, the electromagnetic valve wire is brunt out	Change the electromagnetic valve wire
		The flow setting knob was closed		Turn knob counterclockwis e 6-8 rotations to open
		The outlet of the paraffin reservoir is blocked or has air bubbles		Remove the strainer to clean it or release the air bubbles
The panel shows incorrect time	Displays incorrect time	Chip malfunction	If the time remains incorrect after resetting, replace the chip	Replace with a new chip
LED light	Abnormal knob switch	The knob switch is faulty	Check with a multimeter. If it is open circuit, replace the knob switch	Replace with a new knob switch
is off	The LED lamp bulb is broken	The LED lamp bulb is broken	Check the bulb with a multimeter. If it is open circuit, replace the LED lamp bulb	Replace with a new LED lamp bulb
Cold spot is unable	Knob switch issue	The knob switch is damaged	Check with a multimeter. If open circuit, replace the knob switch	Replace with a new knob switch

to cool down	Cold spot is unable to cool	Peltier element malfunction	Check with a multimeter. If open circuit, the peltier has a malfunction	Replace Peltier
Leaking	Paraffin tank	The paraffin tank is		Replace a new
paraffin	leakage	leaking, possibly at the		paraffin tank
		welded section		

If there are problems that cannot be resolved, please contact the manufacturer.

# 8. Cleaning & Maintenance

#### 8.1 Cleaning the Instrument

#### **External cleaning**

- Wipe dust and fingerprints from the touch screen with a dry cloth; avoid hitting or scratching with hard objects.
- Use a dry cloth to wipe the surface of the equipment.
- For frequently handled parts, a damp cloth can be used. Clean residue wax from the wax outlet with a small shovel if necessary, and wipe with tissue when the wax is still warm. Ensure timely cleaning of any water residue on the cold spot.

#### Paraffin tank cleaning

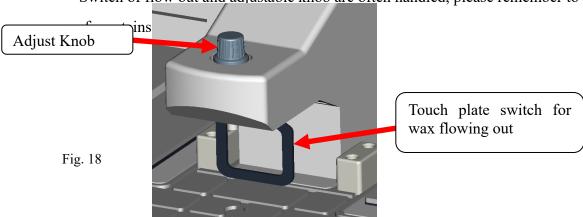
Before replacing with new wax, clean out the old wax. Remove any bubbles around the filter to prevent wax blockage.

#### Tissue tray and embedding tray cleaning

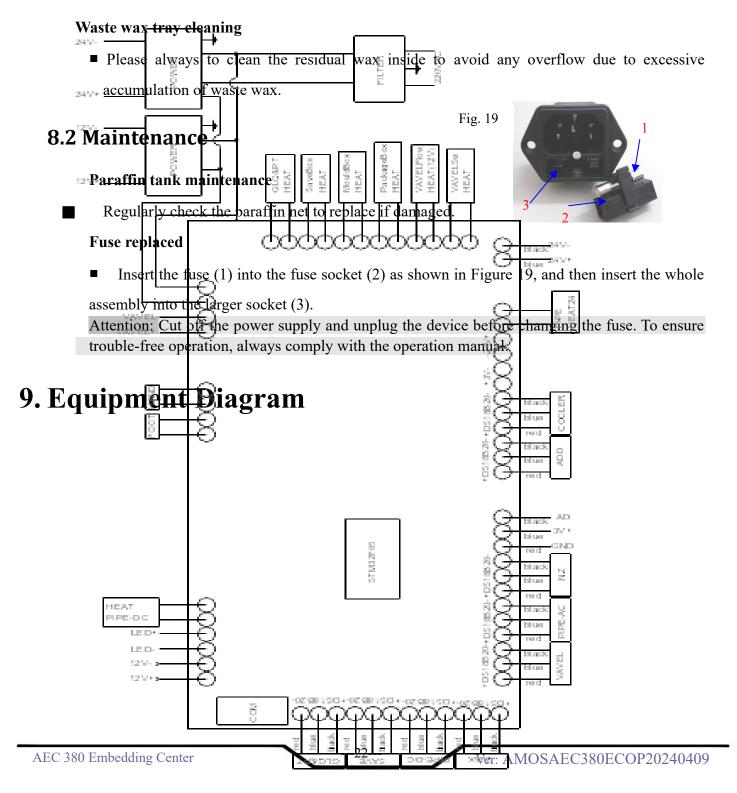
 Tissue tray and embedding tray are frequently used, so remember to clean the inside regularly.

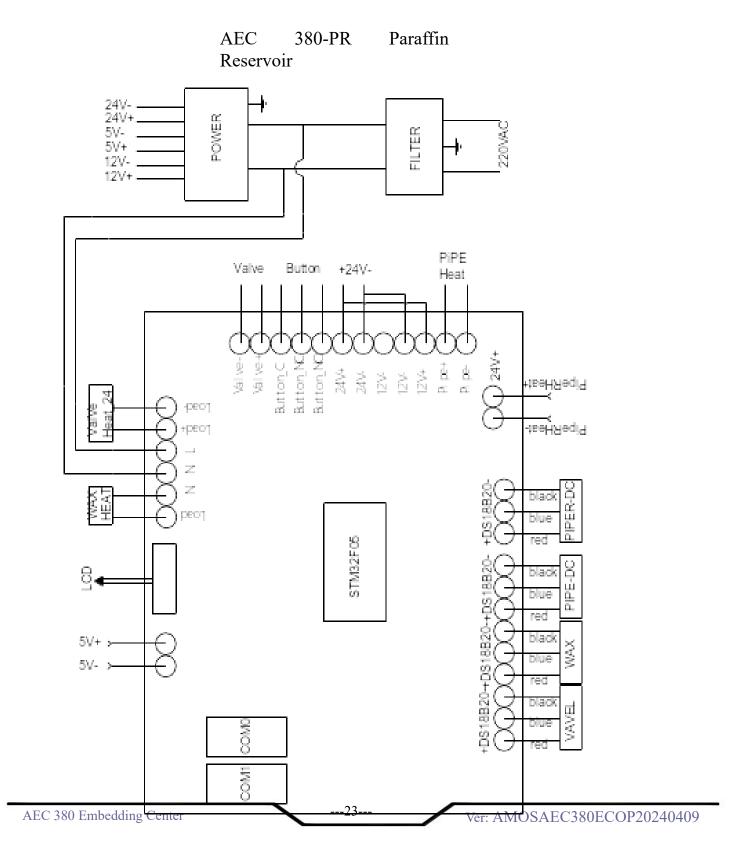
#### Switch of flowing out and adjustable knob cleaning

Switch of flow out and adjustable knob are often handled, please remember to clean the



## AEC 380-M Embedding Module(platform)





# Standard packing list

## **Combination 1:**

AEC 380-PR Paraffin Reservoir connects one piece of AEC 380-M Embedding Module.

No	Accessory Name	Qty	Notes	

1	AEC 380-PR	1 unit	
2	AEC 380-M	1 unit	
3	Power Cord	2 pcs	
4	Serial cable	1 pc	
5	Connection board	1 pc	
6	Connection tube	2 pcs	For Left or Right connected
7	Fuse(3A)	2 pcs	
8	Fuse(5A)	2 pcs	
9	Operation Manual	1pc	
10	Foot Switch	1pc	
11	Magnifier	1pc	

# **Combination 2:**

# AEC 380-PR Paraffin Reservoir connects two pieces of AEC 380-M Embedding Module.

No	Accessory Name	Qty	Notes
1	AEC 380-PR	1 unit	

2	AEC 380-M	2 units	
3	Power Cord	3 pcs	
4	Serial cable	2 pcs	
5	Connection board	2 pcs	
6	Connection tube	2 pcs	
7	Fuse(3A)	2 pcs	
8	Fuse(5A)	4 pcs	
9	Operation Manual	1pc	
10	Foot Switch	2 pcs	
11	Magnifier	2 pcs	

# Published by:



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