

***ENGLISH***

**AG-110  
INSTRUCTION MANUAL**

● Preface

Thank you for choosing this product, in order to better use you, before the installation and debugging, please carefully read this operation instructions and the sewing machine equipment instructions, correct use. And by the professionals to install, debugging.

## Safety precautions

### 1.1 Scope of use

This servo controller is designed for industrial sewing machine. If used in other aspects, please pay attention to the safety of the user.

### 1.2 Working environment

1.2.1 Supply voltage is within  $\pm 10\%$ .

1.2.2 Please stay away from the high-frequency electromagnetic wave transmitter to avoid the generated electromagnetic wave interference with the controller and the wrong action.

1.2.3 Temperature and humidity:

- a. Please operate at room temperature above  $0^{\circ}\text{C}$  and below  $45^{\circ}\text{C}$ .
- b. Do not operate in places or outdoor areas with direct sunlight.
- c. Please do not operate too close to the heating system (electric heater).
- d. Please maintain 30% to 95% relative humidity (no condensation).

1.2.4 Please do not operate near the combustible gas or explosives.

### 1.3 Installation

1.3.1 Install the controller correctly according to the instructions.

1.3.2 Before installation, please turn off the power supply and unplug the power cord, and then install it.

1.3.3 When installing the power cord, avoid approaching the rotating parts and leave at least 3 cm.

1.3.4 To prevent noise interference or electric shock accident, please ground the sewing machine and control box.

1.3.5 Before turning on the power supply, determine that this supply voltage must be within  $\pm 15\%$  of the specified electric control voltage.

### 1.4 Regulations on maintenance and repair

1.4.1 Turn off the power before operation or repair.

1.4.2 When turning the head of the machine, replace the pin or ththread.

1.4.3 There is dangerous high voltage in the control box, and the control box can not be

opened until more than 5 minutes after the power supply is turned off.

1.4.4 Repair and maintenance operations shall be performed by trained technical personnel.

1.4.5 Maintenance or repair cannot be performed on the motor and control box.

1.4.6 All parts for maintenance shall be provided or approved by the Company before use.

## 1.5 Hazard warning



This symbol represents the safety precautions that need to be taken when installing the machine. Ignoring this symbol and performing incorrect operations may cause damage to personnel or the machine.

## 1.6 Other safety regulations

1.6.1. After connecting the power supply for the first time, please operate the sewing machine at low speed and check whether the rotation direction is correct.

1.6.2. When the sewing machine is running, please do not touch the hand wheel, machine needle and other moving parts.

1.6.3. All actionable parts must be isolated with the protective device provided to prevent physical contact. Do not insert other items into the device.

1.6.4. Please do not operate when removing the motor cover and other safety devices.

1.6.5. Do not drop the motor or control box on the ground.

1.6.6. Do not let liquid objects such as tea flow into the control box or the motor.

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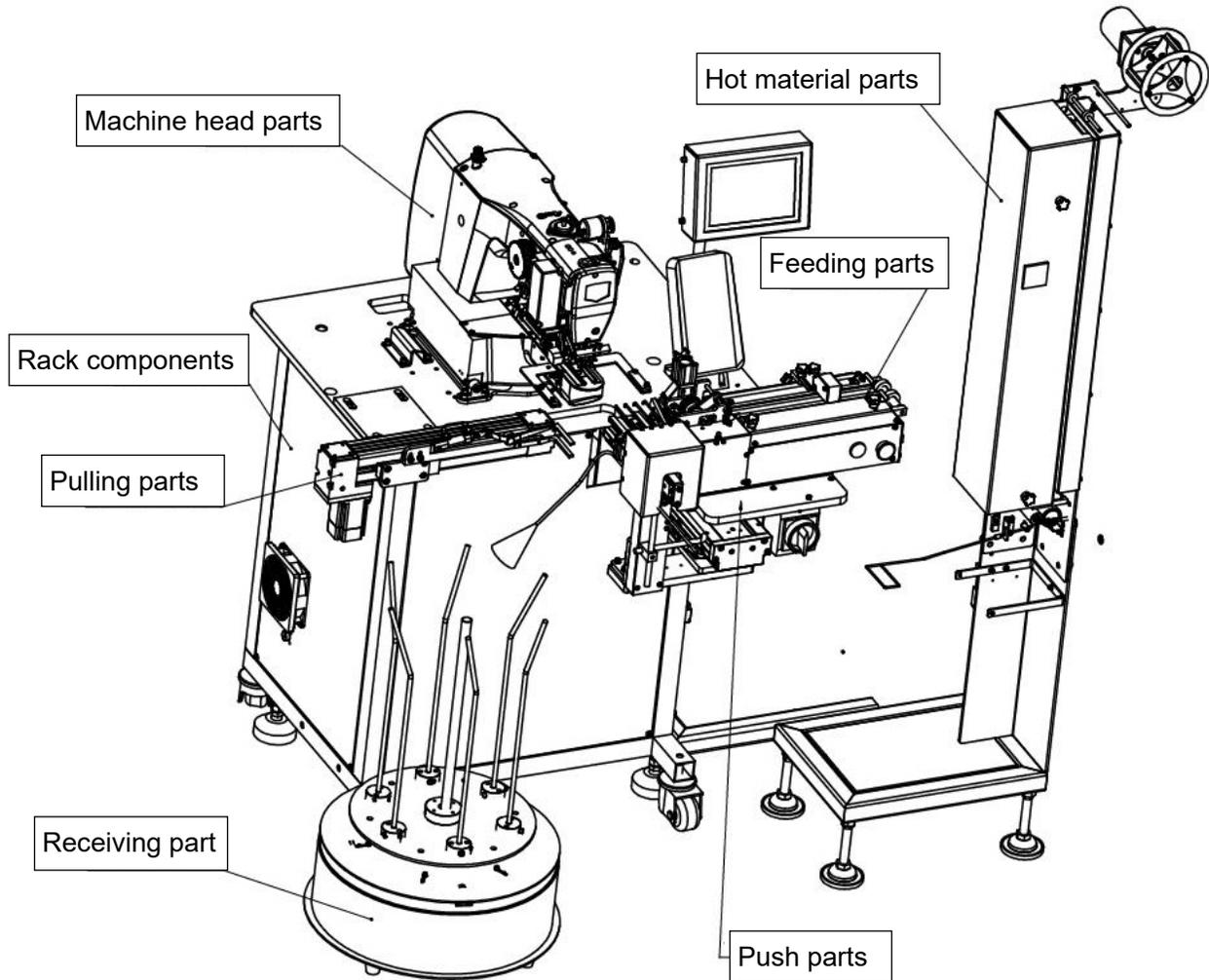
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## I .Equipment technical paramete

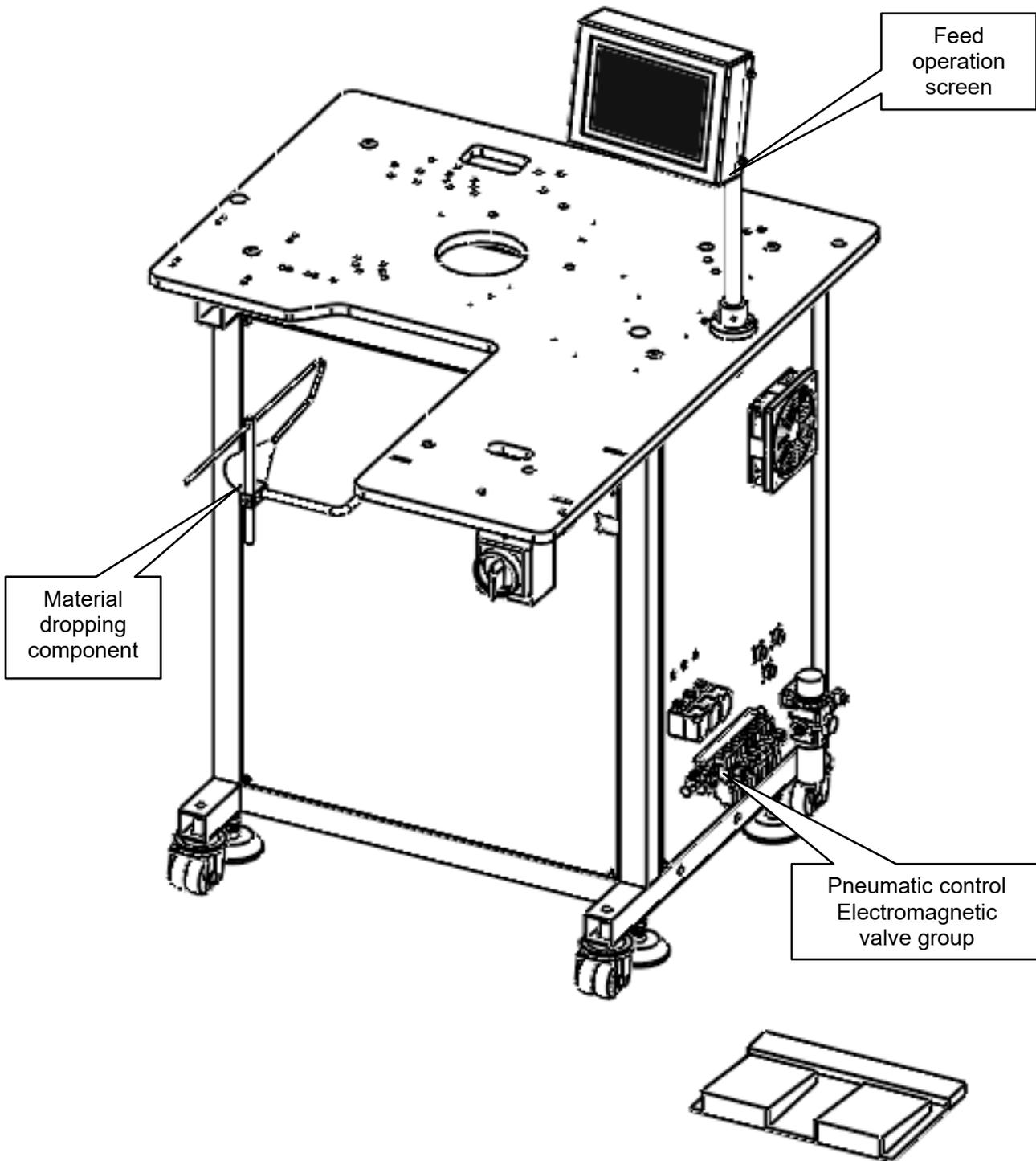
Basic specifications and parameters of fully automatic rubber bands				
	Project	Specifications	Remarks	
<b>Technology Metric</b>	Rubber band type	With the hallmark type, with no hallmark type		
	Sewing trace	Rift and fold		
	Line trace form	Single needle flat seam		
	Maximum rubber band width	60mm		
	Minimum rubber band width	20mm		
	Minimum rubber band length	180mm		
	Ironing function	Recloser		
	Ironing temperature	120-200°C		
	Feed receiving function	Recloser		
	Work pattern		No marks	
			Single paragraph	Marked (LOGO)
			Double size mode	Marked (LOGO)
	Work mode compensation	There are marked compensation modes		
	Cut way	Scissors cut		
	Sewing highest speed	2700 (pin / minute)		
<b>System Parameter</b>	Work efficiency	Production rate is 600-800 pieces / h	Pattern No.928, with a length of 35 centimeters	
	Needle range	0.3~12.7 (mm)		
	Needle distance resolution	0.1(mm)		
	Support the panel program upgrade mode	U disk		
	Type of broken line detection	Digital encoder		
	Power voltage range	220V/50HZ± 10%		
	Power rating	0.75KW		
	Operating ambient temperature	0°C~45°C		
	Humidity of working environment	35%~95% (no condensation)		
	Rated pressure	Equal to or greater than 0.5MPa		
	Gas consumption	28dm <sup>3</sup> /min		
	Equipment size	1700mm×1100mm×1700mm		
	Weight of equipment	260KG	Excluding the weight of wooden crates (65 kg)	

## II . Description of the equipment components

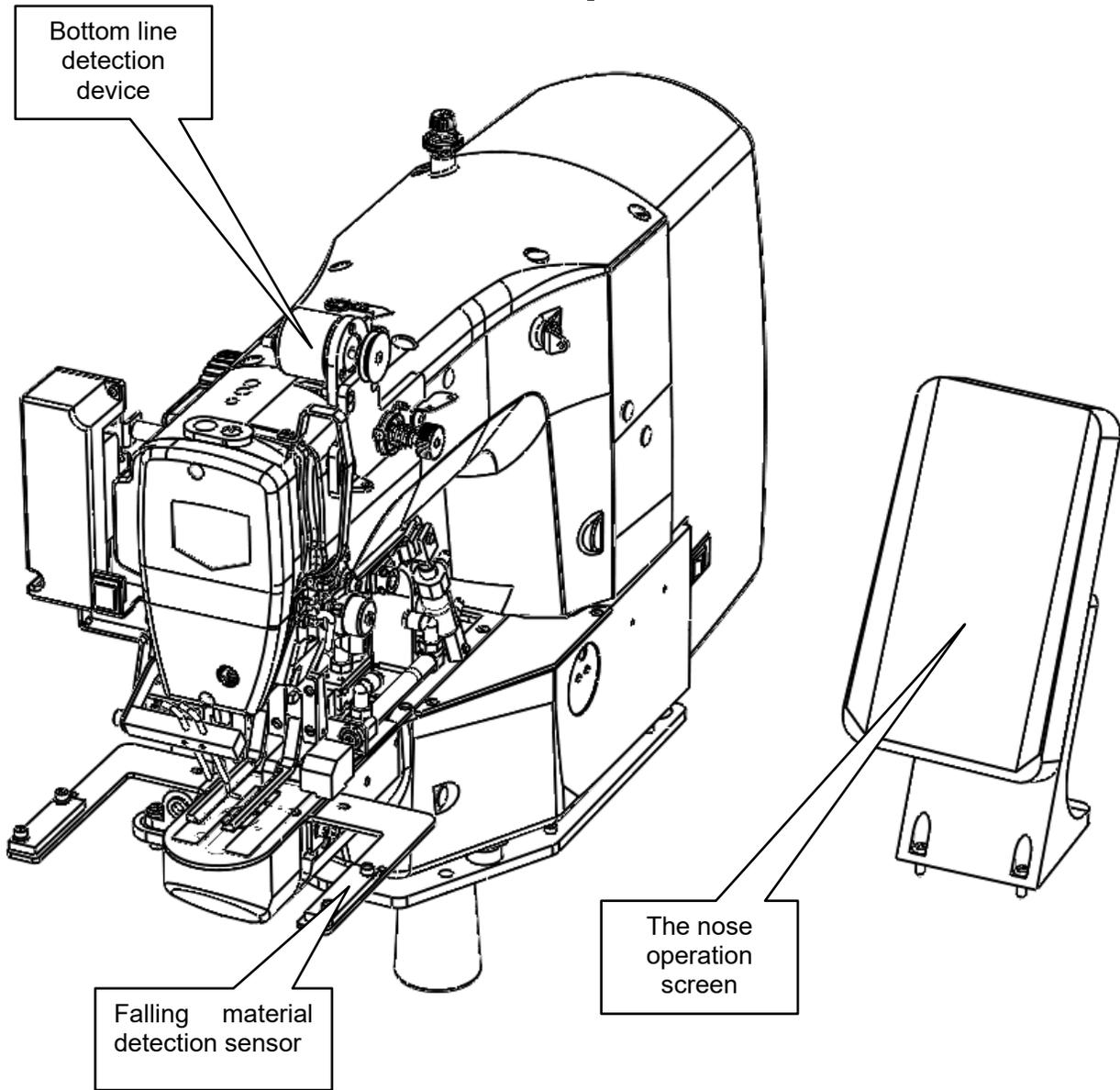
Device diagram



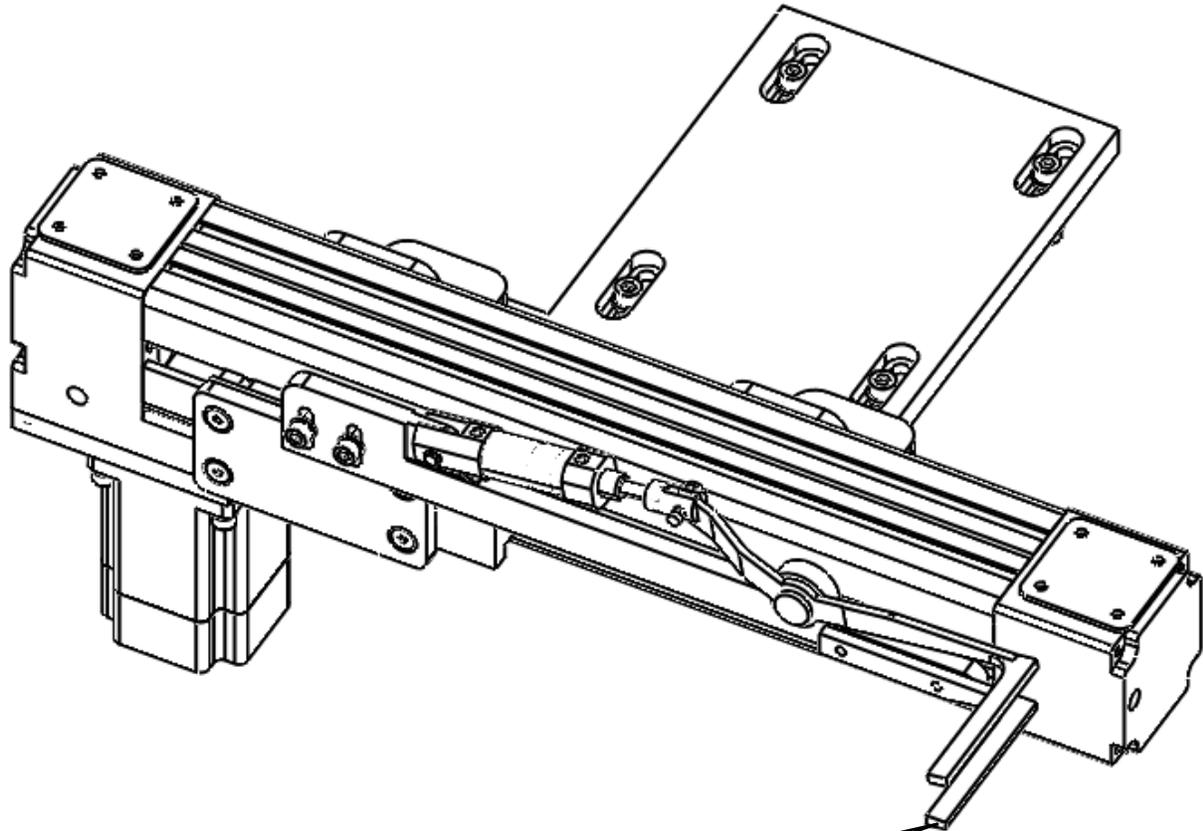
### A. Rack parts



### B. Head parts

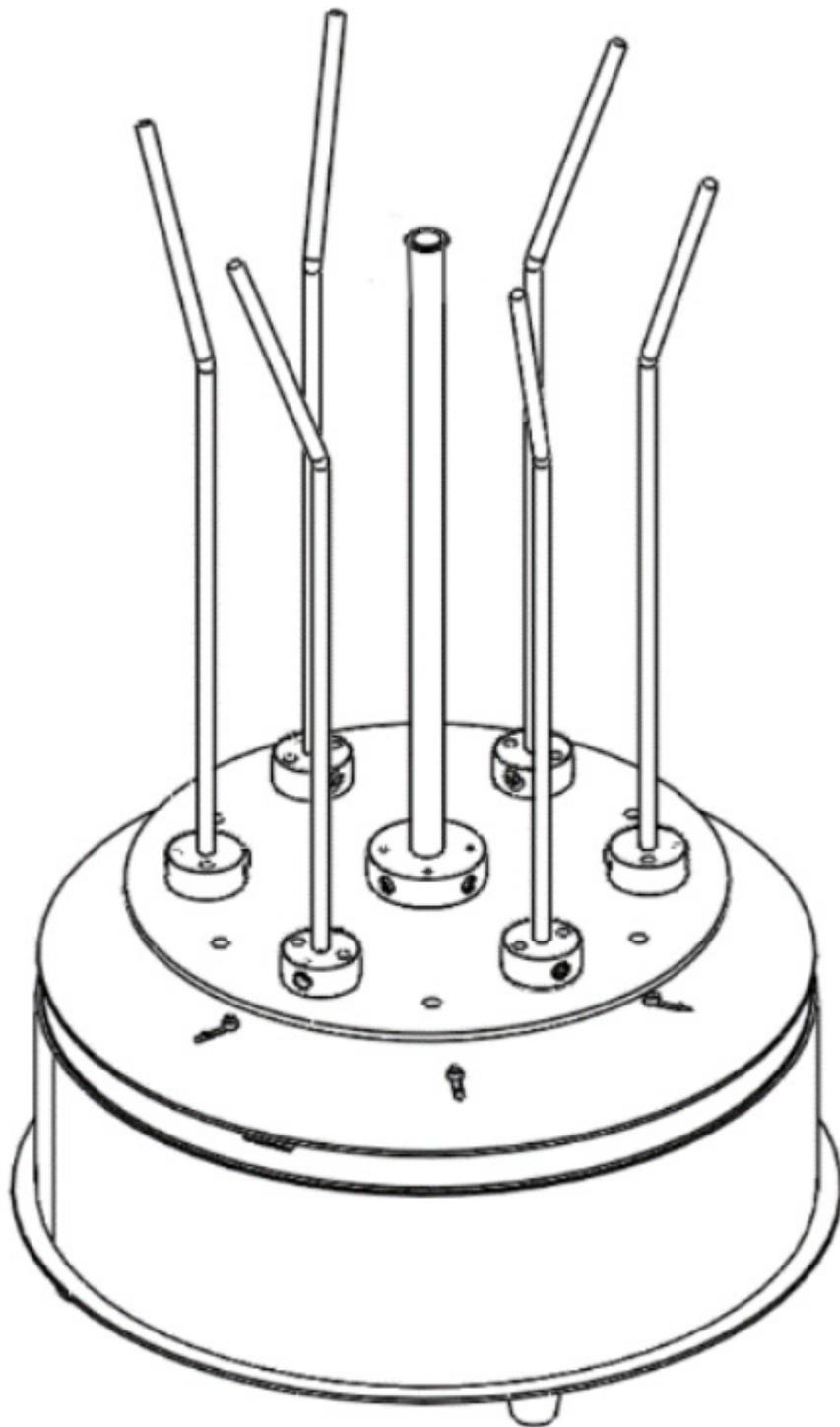


### C. Pull material parts

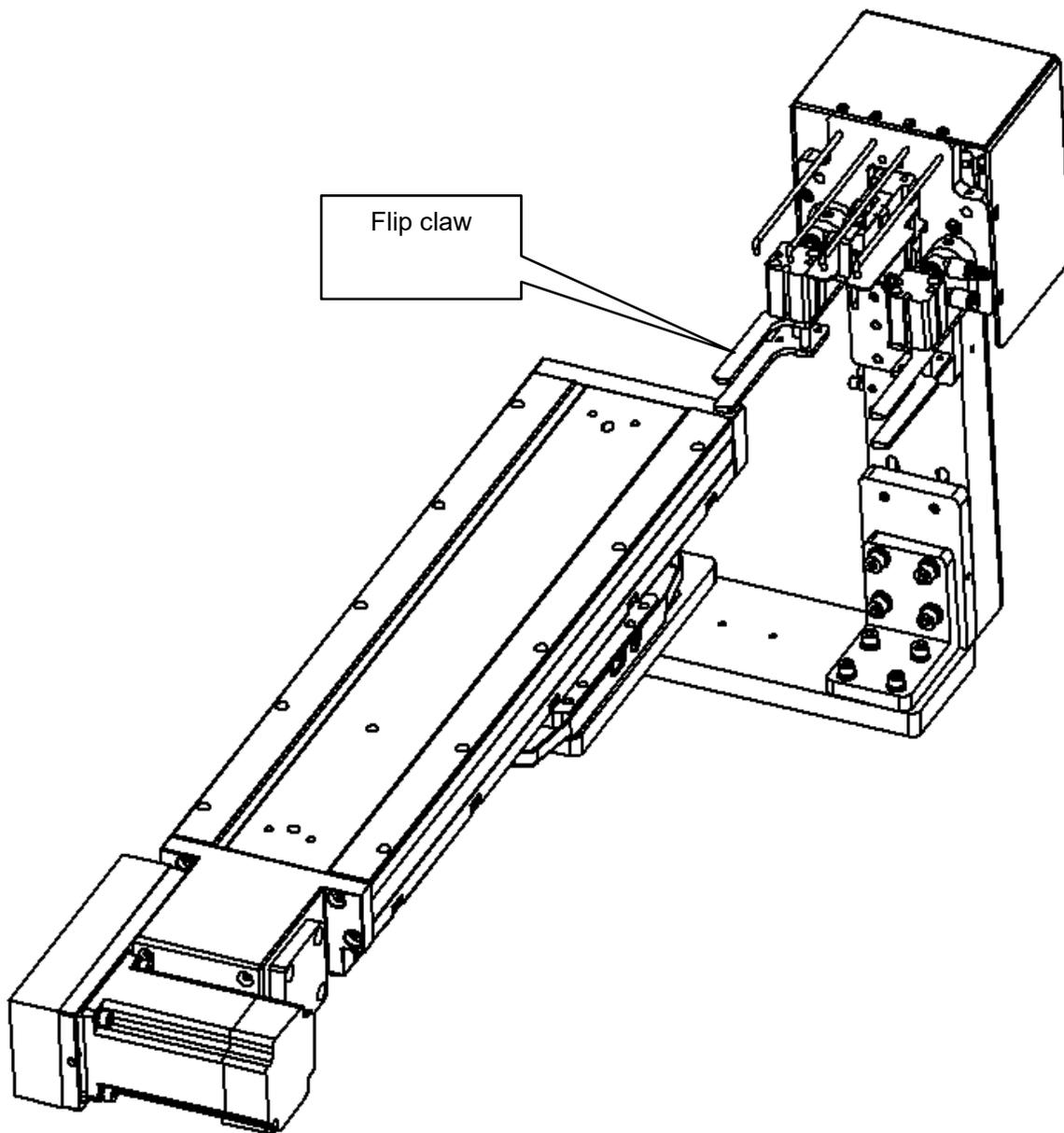


Pull material  
clip claw

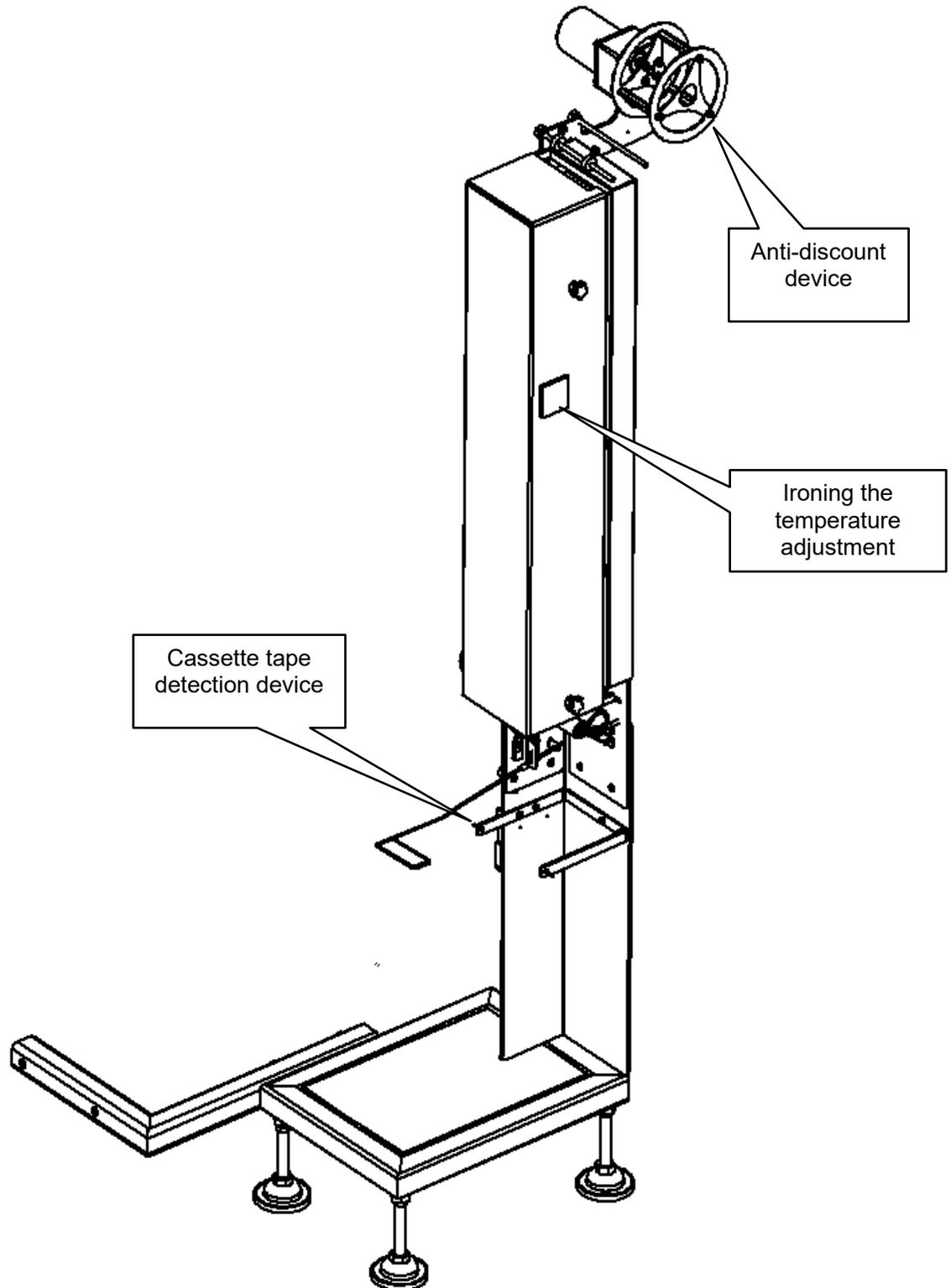
### D. Material receiving parts



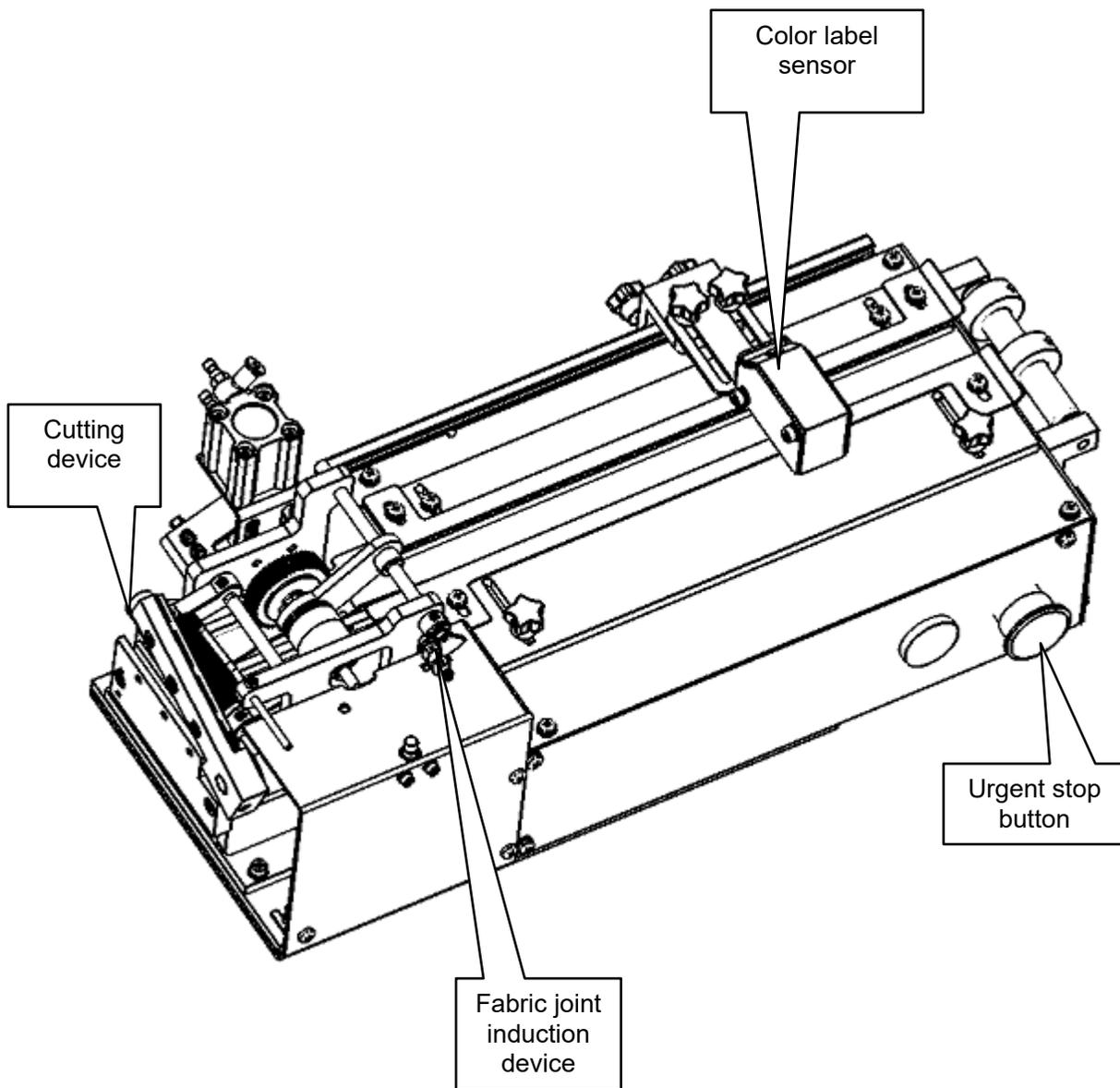
E. Push into parts



### F. Hot stamping material parts

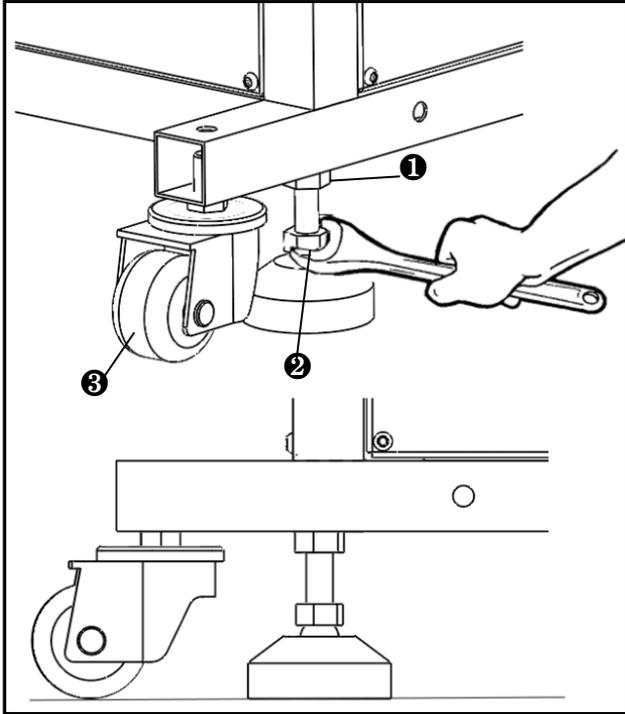


### G. Material delivery parts



### III、Install

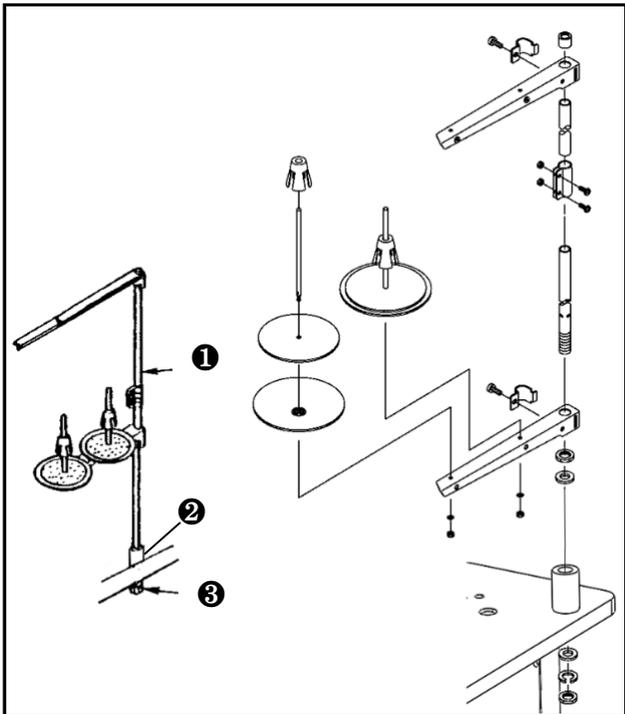
#### 1. Host fixation



1.1 Release the nut ①, turn the high and low regulator ②, and rise to the flush position of the caster ③.

1.2 After setting, tighten the nut ① fixed height regulator ②.

#### 2. Installation of the wire frame



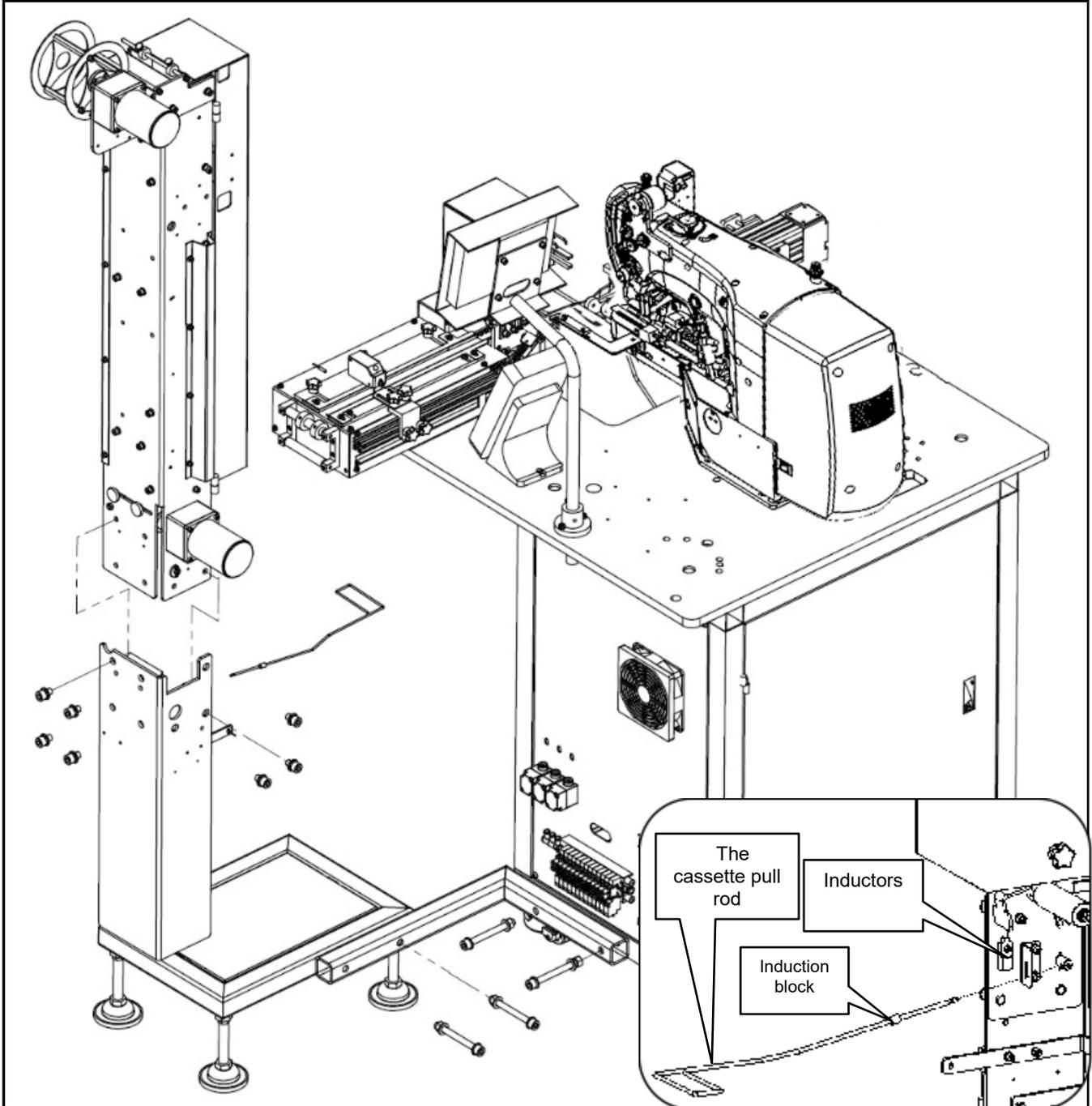
2.1 Assemble the wire frame ① as shown in Fig.

2.2 Set the assembled frame ① through the pad ② on the plate.

2.3 Fixed wire frame ① with fixing nut ③.

### 3. Machine assembly

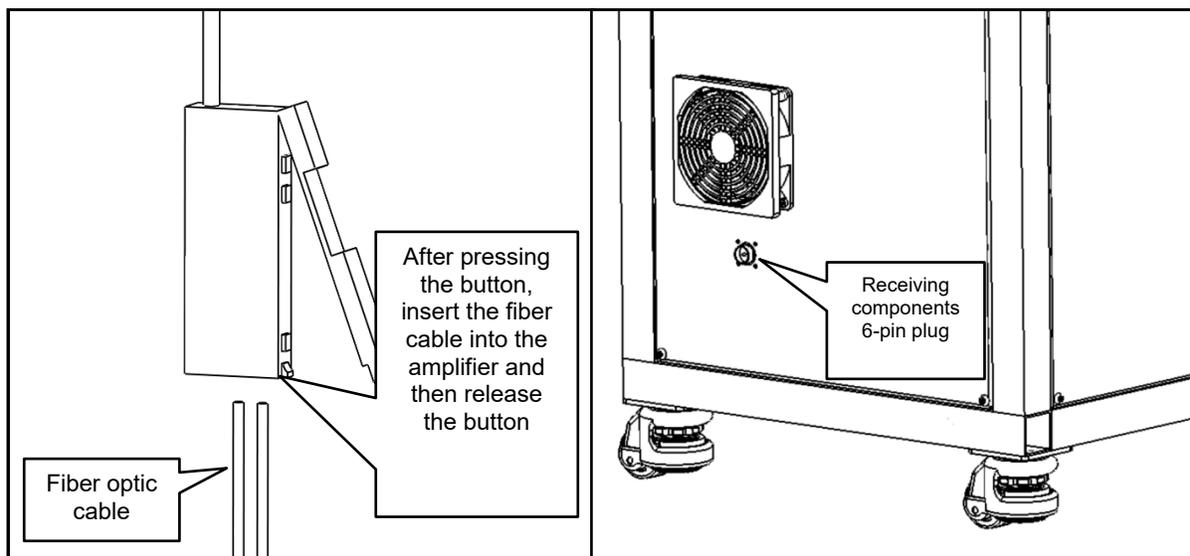
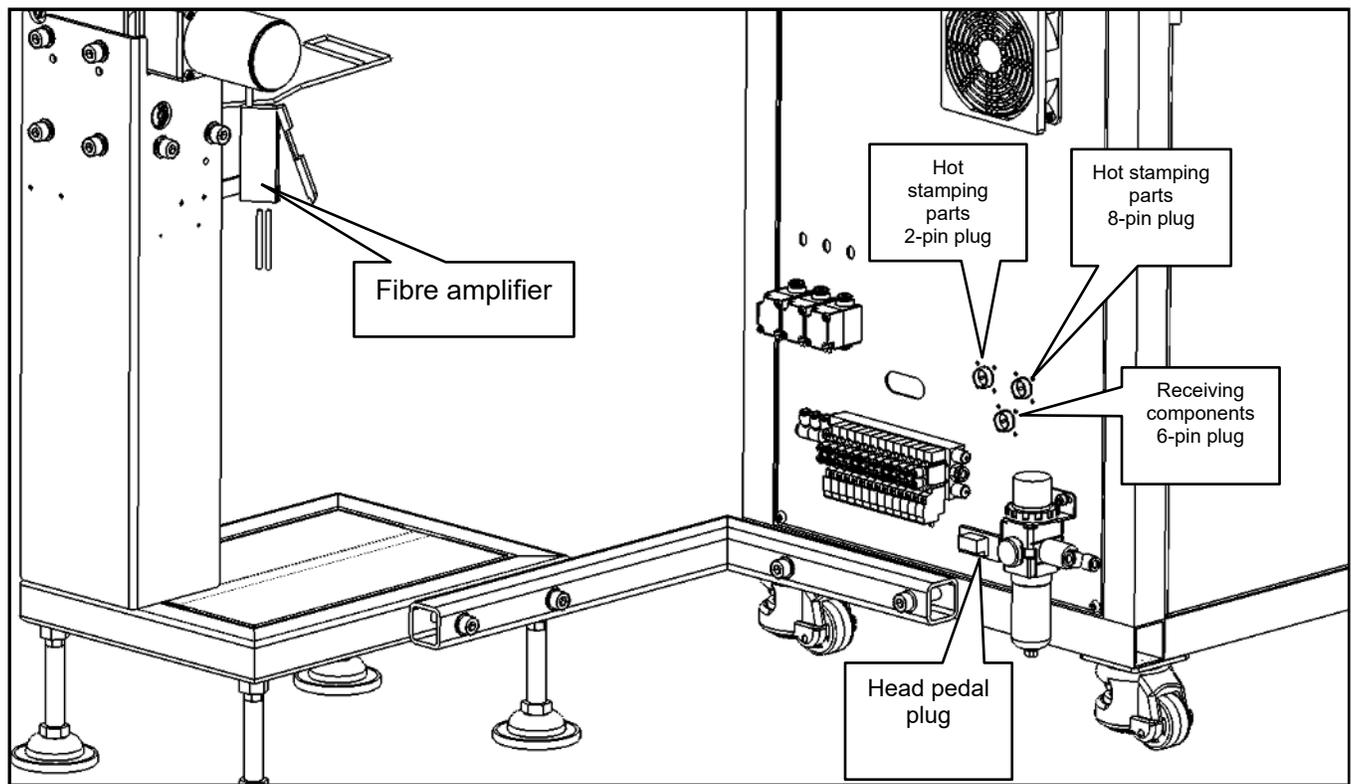
In the figure below, connect the hot material frame, then connect the hot material assembly and fix it on the rack, and adjust the height of the lower foot of the hot material frame flush with the ground.



Install the cassette pull rod on the ironing frame, as small picture. (The induction block should be aligned with the sensor).

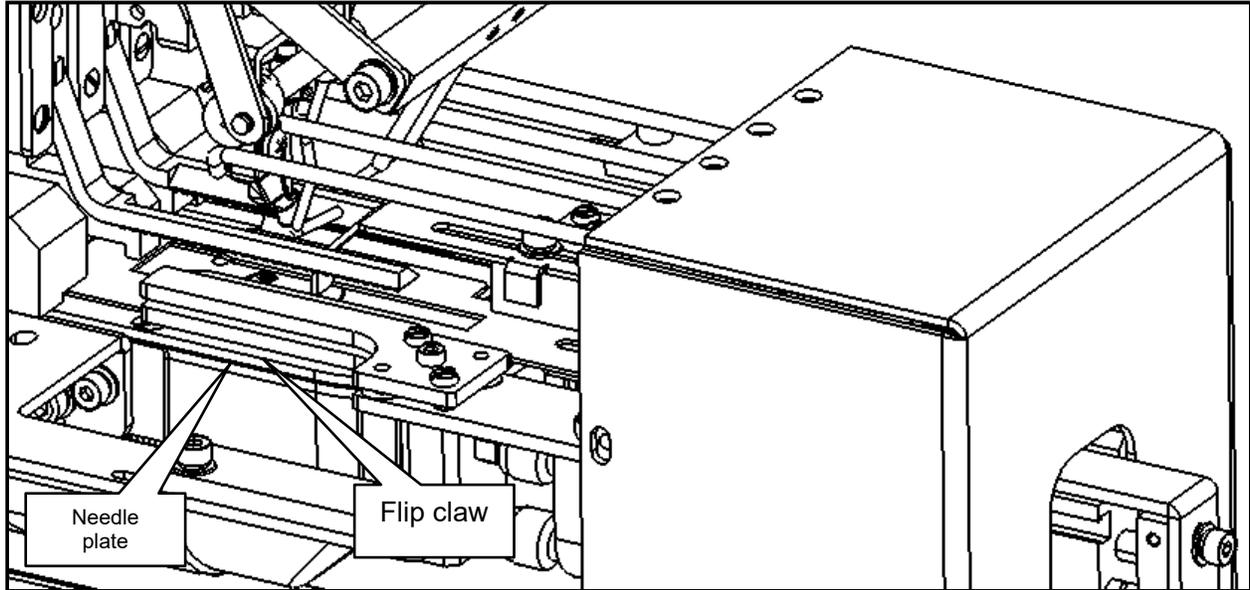
#### 4. Connect all parts and connect with plugs

Connect the cable plugs as shown.

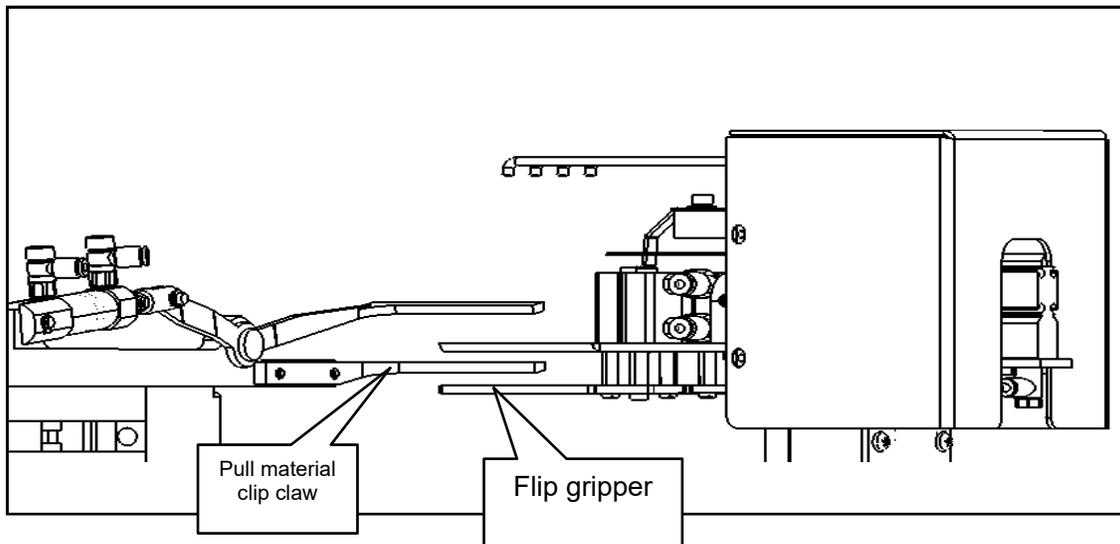


## 5. Check each part

5.1 When the power supply is not supplied, flip the flip foot to the highest point, then push it to check whether the component height is correct, as shown in the figure below:  
(In push state, there shall be clearance between the needle plate to avoid hitting damaged parts during startup)



5.2 When the power supply is not supplied, check whether the position height of the pull material clamp claw is correct, as shown in the figure below:  
(The clamp shall be located between the flip claw to avoid hitting damaged parts during startup)

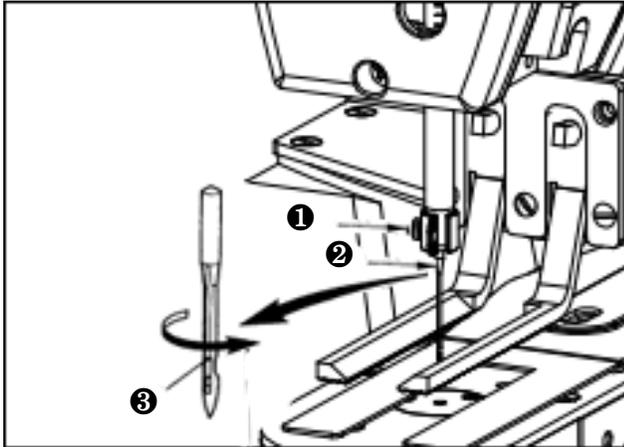


## IV、 Instructions for using the sewing machine heads

### 1 Mechanical class

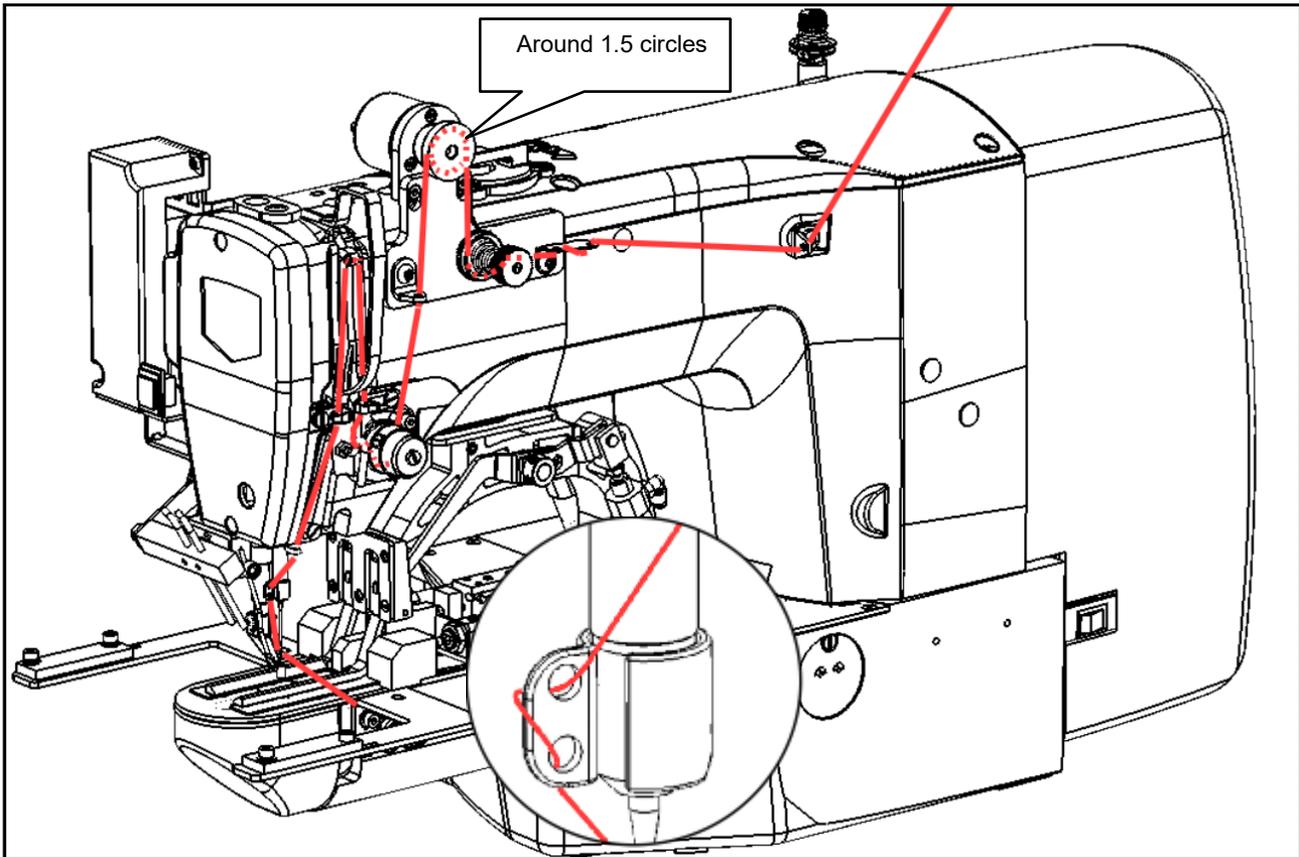
**Warning:** In order to prevent a sudden start from causing personal accidents, please turn off the power supply before operating

#### 1.1 Installation of machine pins



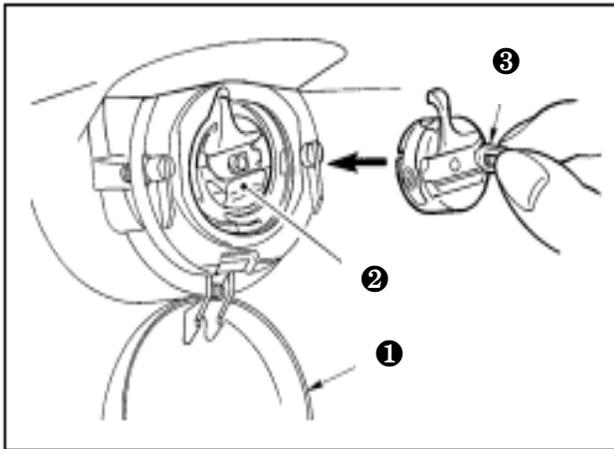
When installing the needle, please loosen the fixing screw ❶, turn the long groove ❸ of the needle ❷ facing to the front, insert it into the depth of the needle rod, and then tighten the fixing screw ❶.

#### 1.2 The threading method for going online



The thread through the needle should be left about 40mm.

### 1.3 Removing and inserting the shuttle shell

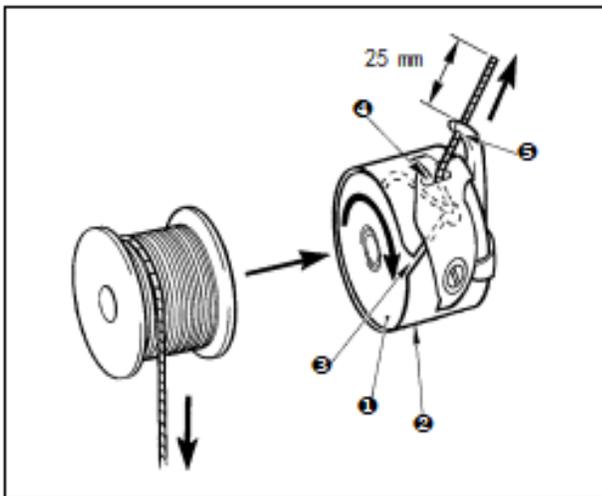


1.3.1 Open the spindle cover **1**.

1.3.2 Pull up the grasping foot **3** of the spindle shell **2** and remove the spindle shell.

1.3.3 When insertion, insert the spindle shell deeply into the spindle shaft and close the foot. Pay attention to! If it is not inserted to the end, the shuttle shell **2** may fall off during the way.

### 1.4 Insertion method of rotary shuttle

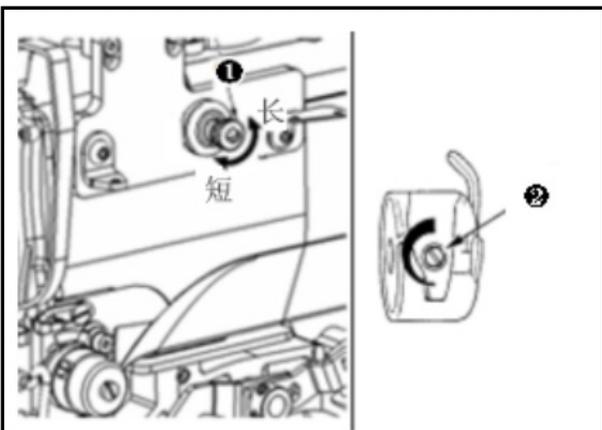


1.4.1 Insert the spindle **1** into the spindle shell **2** in the indicated direction.

1.4.2 Pull the line through the thread port **3** of the spindle shell **2**, and then pull the line out from the thread port **4** under the line tension spring.

1.4.3 Pass the line **5** from the line hole at the corner and pull out 25mm from the line hole. pay attention to! If the shuttle rotates in the opposite direction, the pull-out of the bottom line is unstable.

### 1.5 Adjustment method of line tension



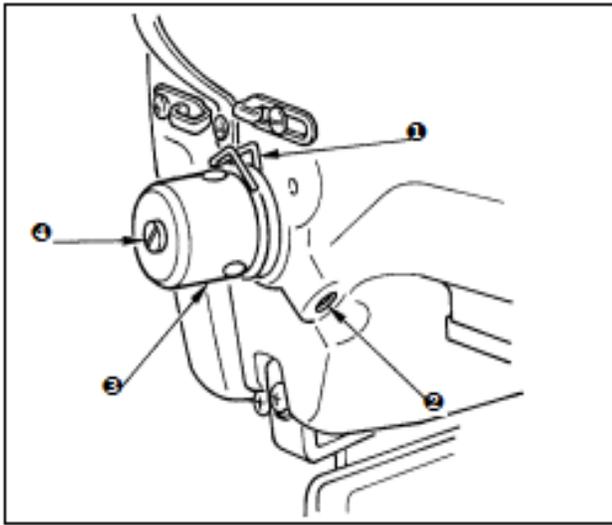
1.5.1 Turn the first line tension knob **1** to the right and cut to the tip.

The length of the residual line becomes shorter, longer to the left.

Please try to make short broken lines without unwinding.

1.5.2 Adjust the on-line tension on the operating plate, and adjust the bottom-line tension with **2**.

## 1.6 Adjustment of wire spring



The standard movement of the pick spring ① is 8~10mm, and the strength is 0.1~0.3N.

### 1.6.1. Adjustment of the movement amount

Release the fixing screw ② and turn the wire tension joint ③. After turning to the right, the movement volume becomes larger, and the pull line volume becomes more.

### 1.6.2. Regulation of intensity

When changing the strength of the pick spring, insert the thin screwdriver into the notch of the tension rod ④ when tightening the screw ②. After turning to the right, the strength of the pick line spring becomes stronger, and after moving to the left, the strength becomes weaker.

## 2 Electronic control class

### 2.1 Universal keys

The keys for the general operation of the system are as follows:

Order number	Icon	Function
1		Cancel key → Exit the current setting interface. When changing the data interface, cancel the data being changed.
2		OK key → Confirm the changed data.
3		Add key → Increase numerical value button upwards.
4		Minus key → decrease value button downwards.
5		Reset key → Release abnormality.
6		Input key → Display the numeric keypad, which allows for numeric input.
7		Prepare key → Switch between data input interface and sewing interface.
8		Information key → Switch between data input interface and information interface.
9		Communication key → Switch between data input interface and communication interface.
10		Mode key → Switch between the data input interface and various detailed setting transformation interfaces.

## 2.2 Basic operation

### ① Turn on the power switch

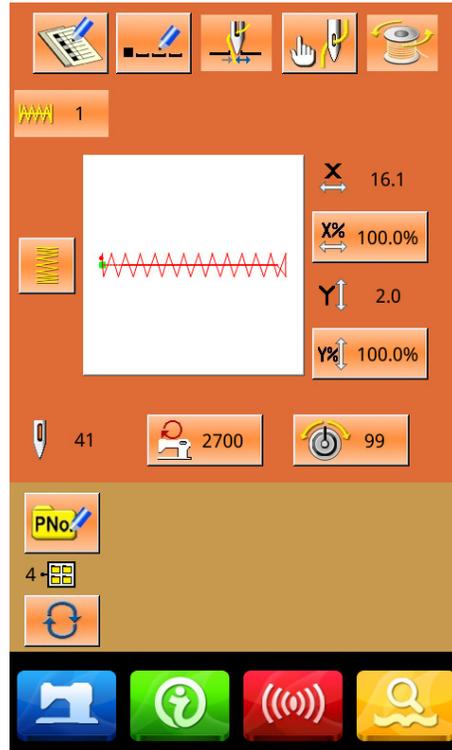
When the power supply is turned on, the data input interface is displayed.

### ② Choose the pattern you want to sew No.

The selected pattern No is displayed under the current interface., After

pressing the pattern display button , you can select the pattern No.

For the operation of pattern selection, see the section [2.7 pattern selection].

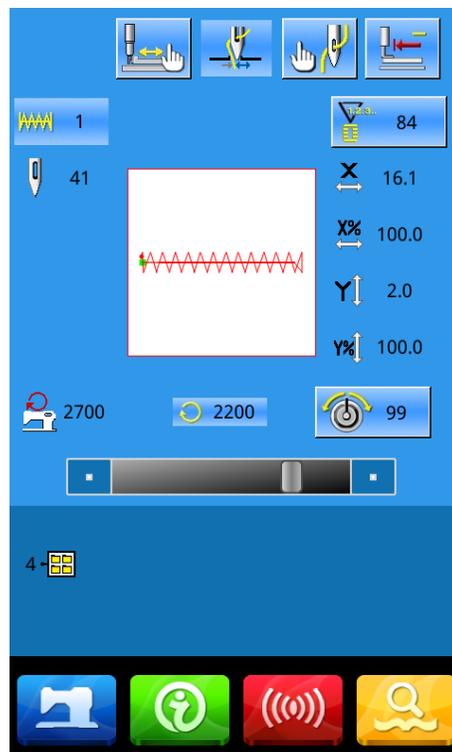


### ③ Set to a sewing state

After pressing the Preparation key , the LCD displays the background color turn blue, become a sewn state.

### ④ Began sewing

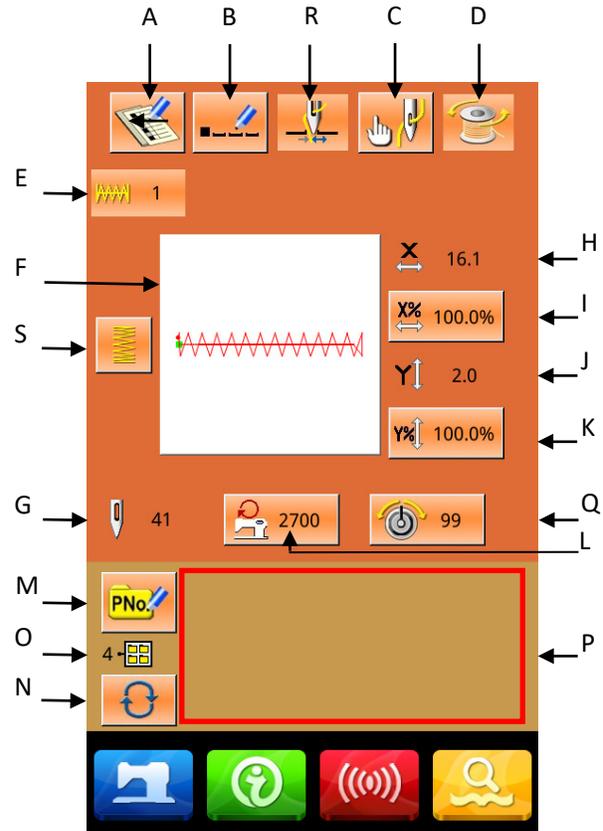
Put the sewing products on the foot, press the plate down the foot, start the sewing machine, and start sewing.



## 2.3 Ordinary pattern operation

### (1) Sewing data input interface

The data input interface is shown in the right figure, please see the function key description table for detailed function description.



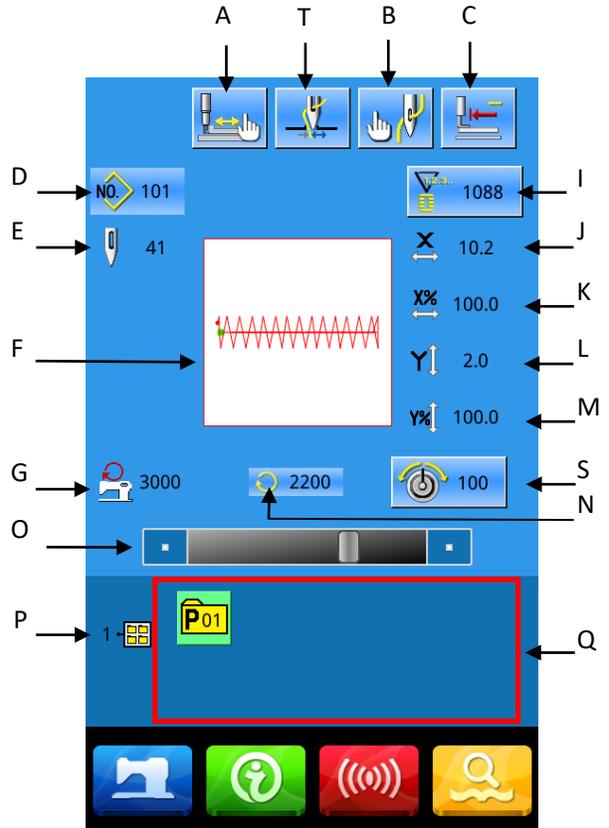
### Function declaration:

Order number	Function	Content
A	Pattern registration	You can register 999 common patterns.
B	Pattern naming	Up to 14 characters can be entered.
R	Press the thread button (Show the case according to the actual mechanical configuration)	Select a valid / invalid grab line. Affected by the U35 parameter.
C	Threading	Down the pressure foot, showing the drop pressure foot screen. Let the foot rise, please press the foot button on the screen.
D	Coiling	Press the prepare button  once before winding the wire
E	Figure number display	Displays the current selected pattern number.

F	Sewing shape selection	The key shows the current pattern sewing shape, and press to enter the pattern selection interface.
G	The number of synchronized needles is shown	Displays the number of currently selected pattern sewing needles.
H	X actual size values are shown	Displays the actual X-direction dimension value of the current selection pattern. The parameter U64 can select the input actual size, and the X actual size value key is displayed.
I	X zoom-in and out rate setting	The key shows the zoom-in rate of the current selected X direction, and enters the Settings interface. Affected by the parameters U64 and U88.
J	Y Actual size values are shown	Displays the actual Y-direction size value of the current selection pattern. The parameter U64 can select the actual size and the actual Y value key is displayed.
K	Y zoom-in and out rate is set	The key displays the Y-direction zoom-in rate of the current selected pattern, and enters the Settings interface after pressing. Affected by the parameters U64 and U88.
L	Maximum speed limit	The maximum speed limit can be set after pressing.
M	Quick pattern (P pattern for short) registration	Used to register P patterns, up to 50 registrations.
O	P pattern folder number display	Displays the current P pattern folder number.
N	P pattern folder selection	Sequentially switch the P pattern folder number.
P	P pattern selection	Show the registered P pattern, press and enter the P pattern data input interface. The initial state does not display this key.
Q	Wire tension setting (display the key according to the actual mechanical configuration)	Show the base value of the line tension, and set it after pressing it.
S	Parameter template settings	Quickly generate template patterns with parameter settings

(2) Sewing interface

Press  to enter the sewing interface as shown in the right figure. Please refer to the function key description table for detailed functional descriptions.



Function declaration:

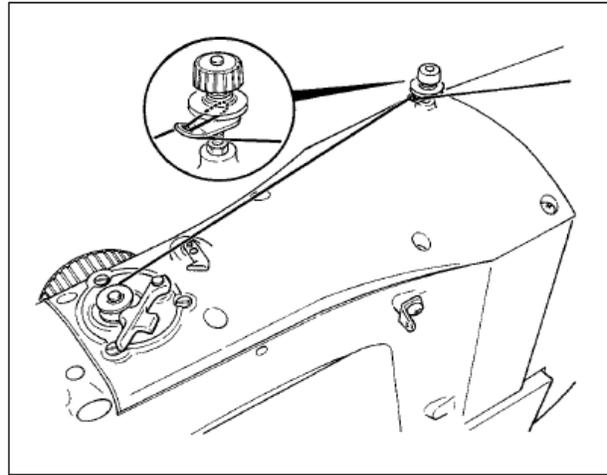
Order number	Function	Content
A	Seat	After pressing, enter the seam interface to determine the pattern shape.
T	Press the thread button (Display the key according to the actual mechanical configuration)	Select a valid / invalid grab line. Affected by the U35 parameter.
B	Press the foot to drop the button	Down the pressure foot, showing the drop pressure foot screen. When letting the foot rise, press the foot button on the drop foot screen.
C	Origin reset	Press the back foot back to the starting point and raise the foot
D	Figure number display	Displays the current selected pattern number.

E	The number of synchronized needles is shown	Displays the number of currently selected pattern sewing needles.
F	Pattern shape display	Displays the current selected pattern shape.
G	The maximum speed limit is displayed	Display the maximum speed limit value.
H	Pattern name	Displays the current selected pattern name.
I	Counter settings	When pressing, you can select the counter type and set the current count value.  : Sewing counter  : Counter counter
J	X actual size values are shown	Displays the actual X-direction dimension value of the current selection pattern.
K	X zoom-in and out rate setting	Displays the X-direction zoom-in rate of the current selection pattern.
L	Y Actual size values are shown	Displays the actual Y-direction size value of the current selection pattern.
M	Y zoom-in and out rate is set	Displays the Y-direction zoom-in rate of the current selection pattern.
N	Sewing speed is shown	Show the current sewing speed.
O	Sewing speed setting	Sewing speed can be changed.
P	P pattern folder number display	Displays the current P pattern folder number.
Q	P pattern selection	Show the registered P pattern, press and enter the P pattern sewing interface. The initial state does not display this key.
R	A pause button	The machine stops running after pressing. Due to the parameter U31, select the panel pause button option to display the pause button, while other options are not displayed.
S	Line tension setting (Display the key according to the actual mechanical configuration)	Show the base value of the line tension, and set it after pressing it.

## 2.4 Wire

### ① To install spindle core

Put the core into the spool. As shown on the right.



### ② Display the bottom line winding interface

After pressing the wire winding button



on the data input interface, the wire winding interface is displayed (As shown in the right figure).

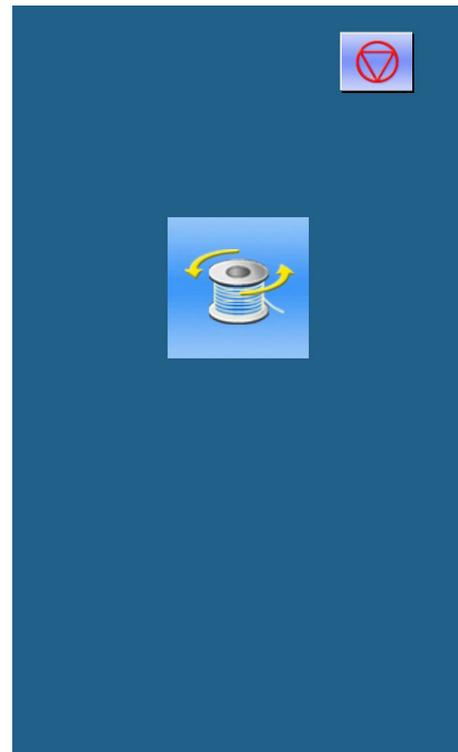
### ③ started winding

After stepping on the starting pedal, the sewing machine turns and starts winding.

### ④ Stop the sewing machine

After pressing the stop button , the sewing machine stops turning and returns to the usual mode. In addition, after pressing the pedal again in the winding bottom line, the sewing machine stops the sewing machine in the winding mode, so by pressing the starting pedal again, you can continue to roll the bottom line, which can be used when winding multiple spindle cores.

**Note:** after the power is turned on, or just changed to the host input, not rolling action. Please set a pattern once, press the preparation button  and then display the sewing screen.



## 2.5 Figure pattern selection

### ① Enter the pattern selection interface

Data input interface (as shown in the figure on the right), click sewing shape A to enter the pattern selection interface.

The top of the pattern selection interface is the sewing shape of the current selection pattern, and the bottom is the registered pattern number.



: Pattern preview

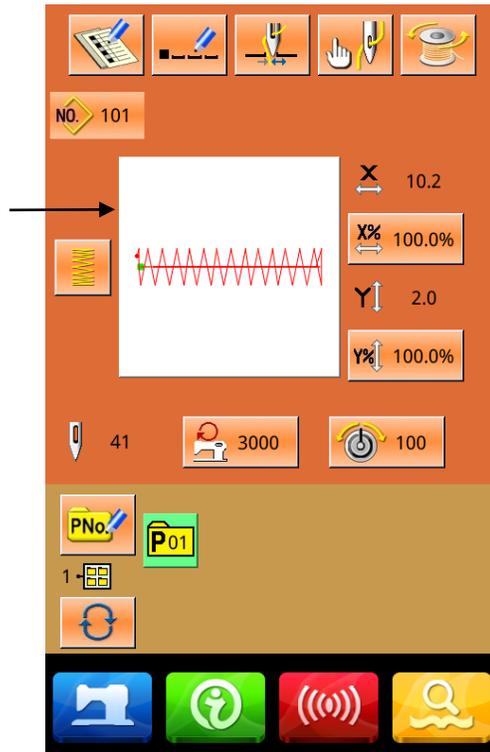


: Enter the number to find the patterns



: Pattern delete

A



Click the A key, when there is A common pattern, it will switch back and forth between the basic pattern and the user pattern.

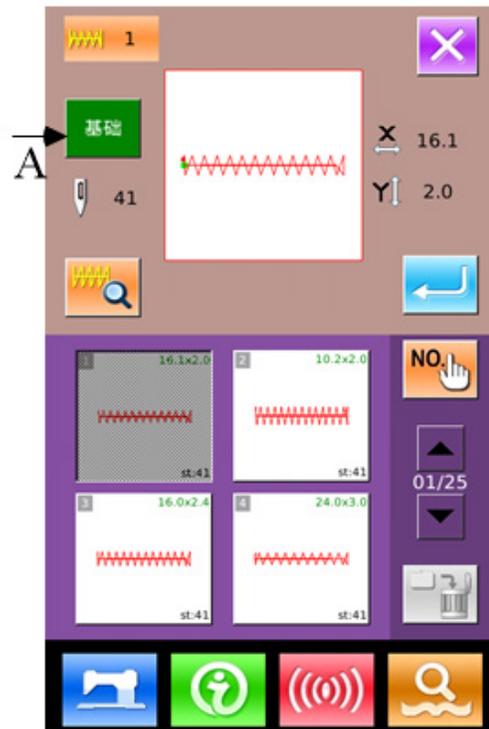
### ② choose patterns

For the current base pattern, each page can display 4 pattern numbers and 20 pattern numbers per page. For the basic pattern, the schematic diagram and x and y range are displayed on each pattern number; the compiled pattern only shows the pattern number.

When the registered pattern number is selected, the selected pattern content will be displayed at the top, and press the



complete pattern selection operation.



### ③ pattern query



Press the key  will pop up the pattern query interface, through the number key can directly enter the pattern number.

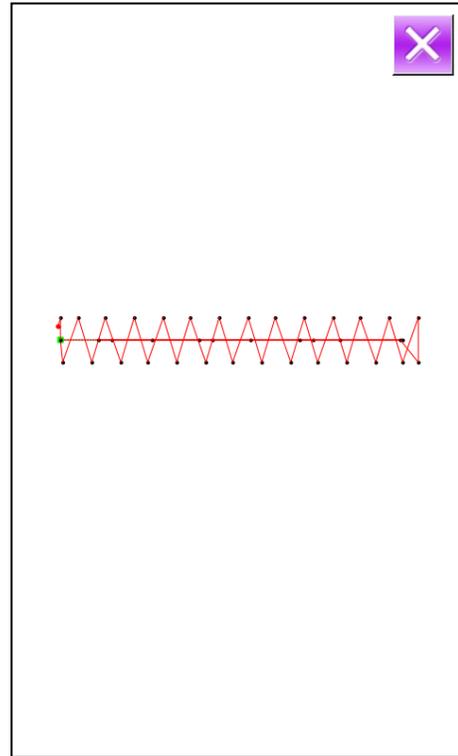
**④ pattern deletion**

Select the registered pattern, press the key  will delete the pattern, but the pattern that is registered to P can not be deleted.

**Note:** the pattern is divided into basic pattern and general pattern: the basic pattern is the factory pattern, can not be deleted; the general pattern is the user to play, copy or U disk import pattern, the pattern can be deleted and modified.

**⑤ pattern preview**

Press  down to preview the current pattern shape in full screen.(White in the background color)



**2.6 Sewing data setting**

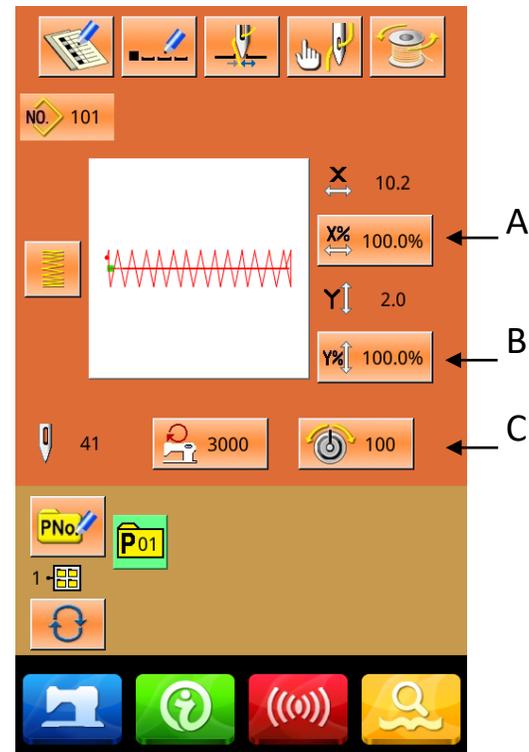
**① Enter the sewing data setting interface**

Press A, B and C accordingly under the data input interface to enter the zoom rate setting and speed limit setting interface respectively.

	Project	Input range	Initial value
A	Magoom and reduction rate in X direction	1.0~400.0%	100.0%
B	Magoom and reduction rate in Y direction	1.0~400.0%	100.0%
C	Maximum speed limit	400~2700rpm	2700rpm

Note 1: The parameter U64 can choose the zoom-in rate or actual size value.

Note 2: The maximum input range and initial value of the maximum speed limit are affected by the parameter U01.

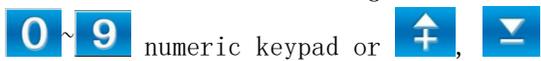


### ② Zoom ratio setting

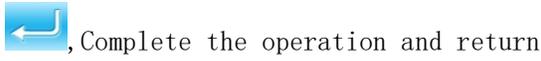
The picture on the right shows the zoom ratio setting interface. The upper part of the interface is the X direction setting, and the lower part is the Y direction setting.

- A: Actual value display in X direction
- B: X direction magnification ratio display
- C: Actual value display in Y direction
- D: Y direction magnification ratio display

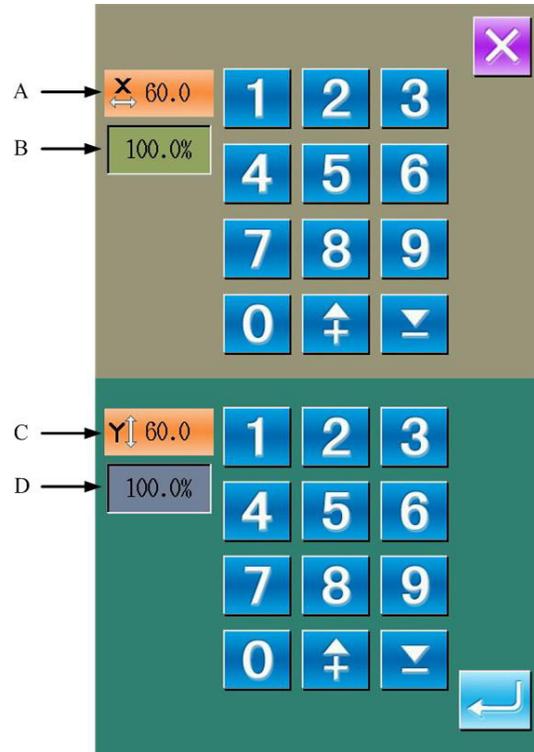
Enter the desired value using the



Keys, The entered number is inserted into the first digit of the displayed value, Progression of previously entered numbers one by one, Press OK key

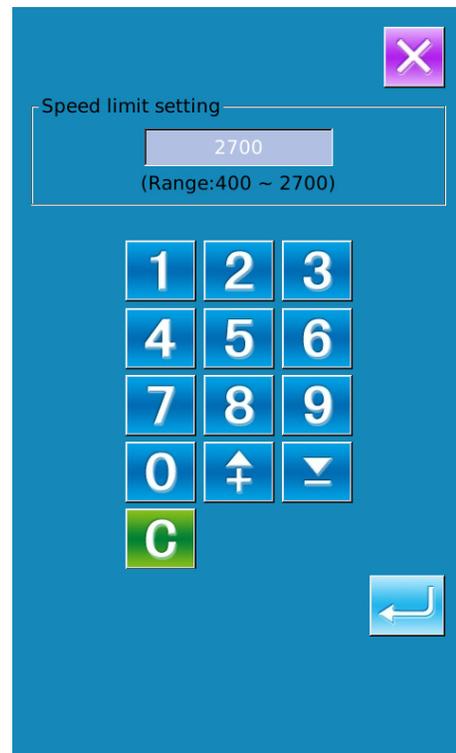


, Complete the operation and return to the data input interface.



### ③ Maximum speed limit setting

Same operation as above.



## 2.7 Trial sewing operation

### ① Show sewing interface

In the data input interface, After pressing the prepare button  , The background color of the LCD display changes to blue, Now enter the sewing interface.

### ② Display the trial sewing interface

### ③ Start trial sewing

In the sewing interface, Press this key  to enter the trial sewing interface (as shown on the right):



: Return to origin



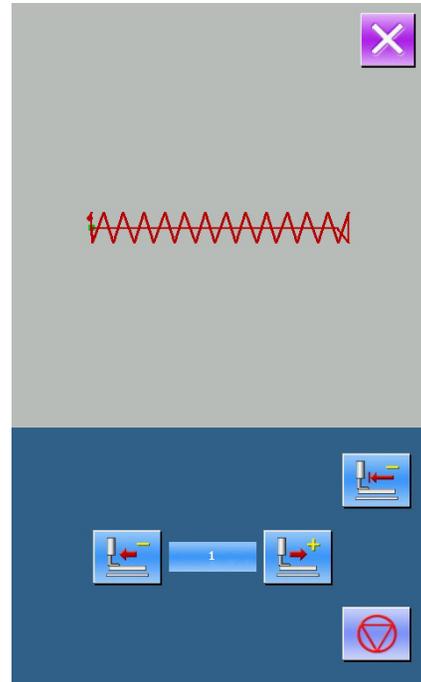
: Presser foot retreats



: Presser foot forward



: stop



Depress the foot switch to lower the presser foot, Use the presser foot retract key  and presser foot forward key  to determine the shape. After pressing keys continuously for a period of time, The presser foot continues to move after leaving the button, Press this button  when you want to stop. After pressing the return to origin key  , The needle returns to the origin and returns to the sewing interface.

### ④ End trial sewing

After pressing the Cancel key  to exit the trial sewing interface, Return to sewing interface.

When the pattern shape is not at the start sewing position or end sewing position, you can start sewing

from the confirmation point after pressing the foot switch. If you want to exit, press the origin reset button  , then Close the pop-up screen, display the sewing screen, and return to the starting sewing position. . .

## 2.8 Emergency stop

Select the pause mode by setting the U31 parameter:

It can be selected through three options: invalid, operation panel pause button, and external switch.

When the pause button on the operation panel is

selected, the pause button will be

displayed on the sewing screen .

### ① Relieve exception

After pressing the pause button during sewing, the sewing machine stops rotating.

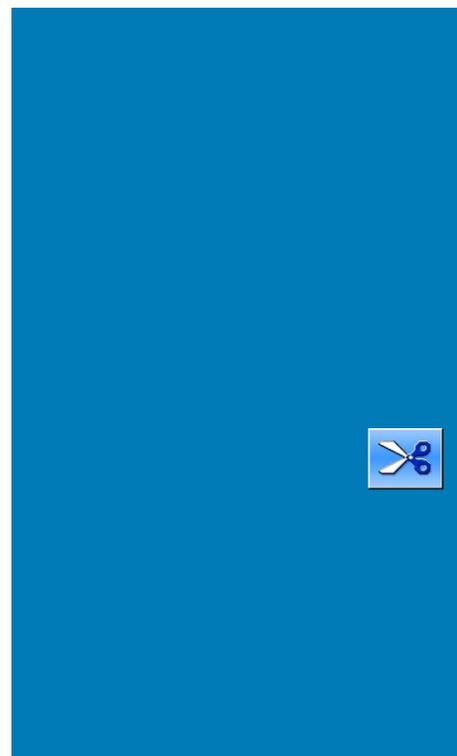
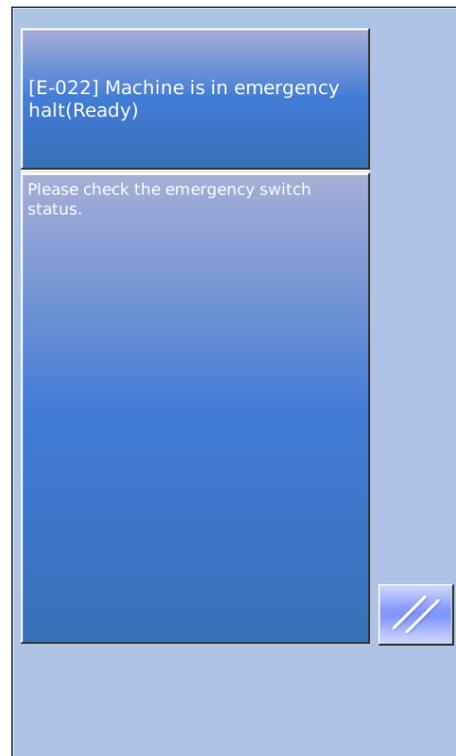
At this time, the abnormal screen is displayed and the notification stop switch is pressed.

At this time, press the reset button  to resolve the abnormality.

### ② Make a tangent

After pressing the thread tangent key , you can perform thread trimming and enter the step setting interface.

**Note :** When parameter U97 is set to automatically trim the thread after pause, it will directly enter the step setting.



③ Perform step settings and adjust the presser foot to the re-sewing position.

Press the tangent key  Enter the step setting interface.

 : Reverse feed

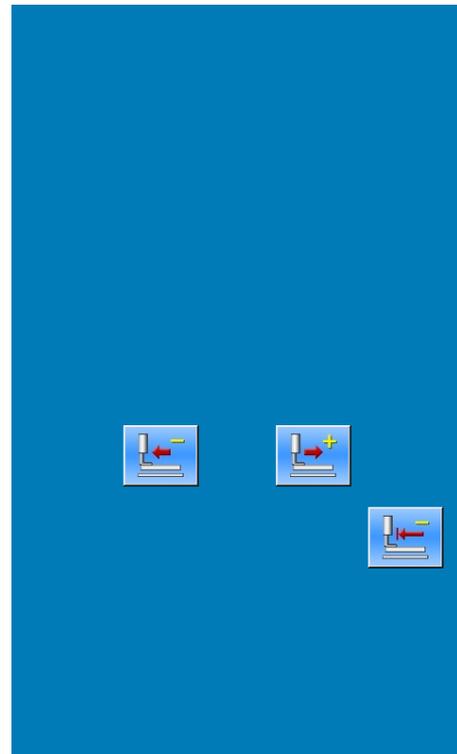
 : Feed forward

 : Return to origin

Press the  or  key , Move the presser foot to the re-sewing position.

④ re-sewing

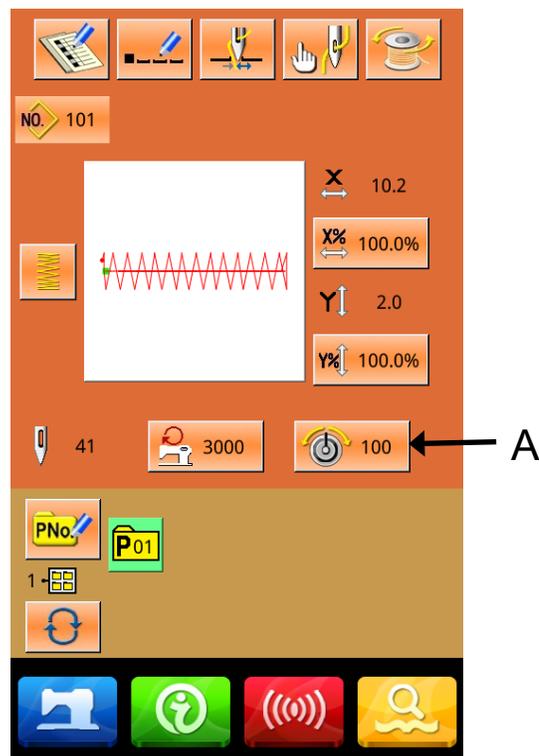
After depressing the foot pedal, restart sewing.



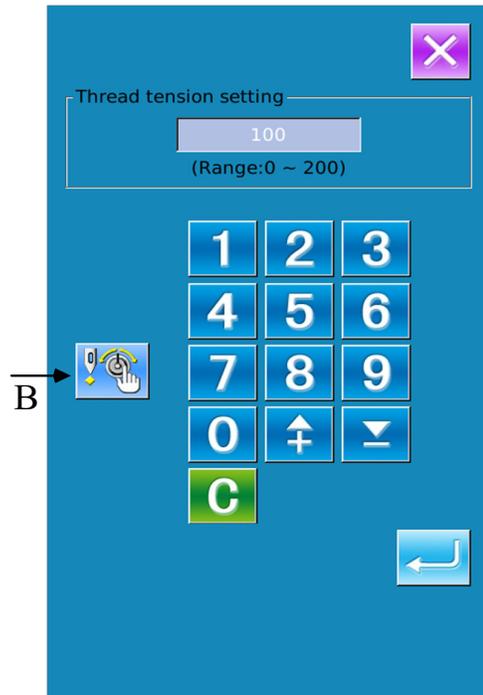
## 2.9 Single needle thread tension setti

① Enter single needle thread tension setting

In the running interface (as shown on the right), Click Thread Tension Setting (A) to enter the thread tension setting interface.



In line tension setting interface(as shown on the right) , Click on single needle thread tension setting(B) , Enter the single needle thread tension setting interface.

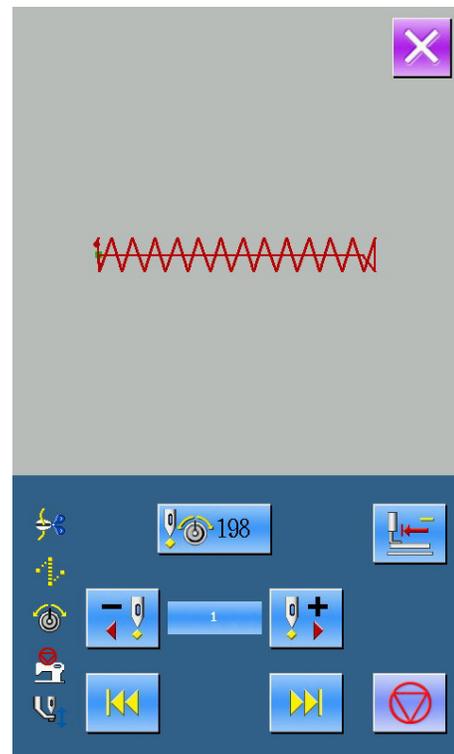


② Single needle thread tension setting

After clicking this key  , Enter the thread tension setting interface, The setting method is the same as the 2.5 method.

When the external presser foot is lowered, Press the  or  keys to move forward or backward one stitch. Use the  key or the  key to move backward or forward to the needle drop point with the wire tension command. When you want to stop, press this key .

After pressing return to origin  , Move to origin.



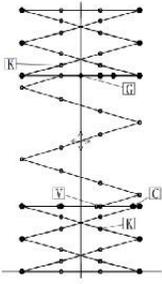
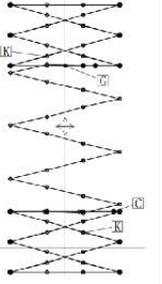
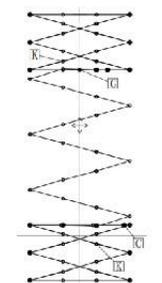
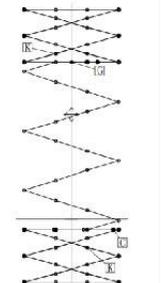
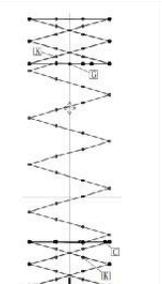
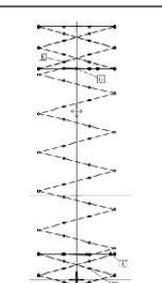
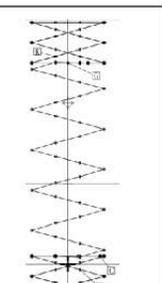
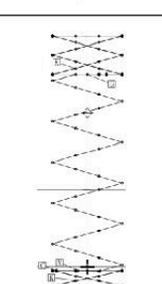
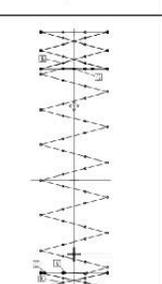
2.10 Alarm information list

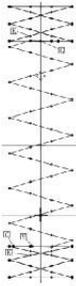
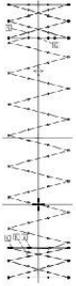
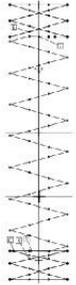
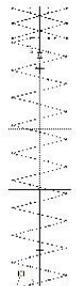
Fault number	Fault name	Reset method
E-001	The pedal is not in the correct position.	Please adjust the pedal position.
E-002	The machine enters emergency stop state	Please check the emergency stop switch status.
E-003	Confirm that the machine head is tilted down	
E-004	Main voltage (300V) is too low	Please turn off the power and check the system hardware.
E-005	Main voltage (300V) is too high	
E-007	IPM overvoltage or overcurrent	Please turn off the power and check the system hardware.
E-008	Auxiliary equipment voltage (24V) is too high	Please turn off the power and check the system hardware.
E-009	Auxiliary equipment voltage (24V) is too low	Please turn off the power and check the system hardware.
E-010	Air valve (fan) failure	Please turn off the power and check the system hardware.
E-012	Abnormal presser foot position	Please turn off the power and check the system hardware.
E-013	The encoder is faulty or not connected.	Please turn off the power and check the system hardware.
E-014	The motor is running abnormally	Please turn off the power and check the system hardware.
E-015	Exceeding the sewing range during movement	Please press the OK button to resolve the fault.
E-016	Abnormal position on the needle bar	Please press the OK button to resolve the fault.
E-017	Disconnection detection abnormality	Please press the OK button to resolve the fault.
E-018	Abnormal position of scissors	Please turn off the power.
E-019	The emergency stop switch is not in the normal position	Please check the emergency stop switch
E-020	Stepper software version error	Please turn off the power.
E-021	The machine enters emergency stop state (Free)	Please check the emergency stop switch status.
E-022	The machine enters emergency stop state (Ready)	Please check the emergency stop switch status.
E-023	Abnormal thread catching position	Please turn off the power.
E-024	Wrong connection between operating head and sewing machine	Please turn off the power.
E-025	X origin detection abnormality	Please turn off the power.
E-026	Y origin detection abnormality	Please turn off the power.
E-027	Presser foot origin detection abnormality	Please turn off the power.
E-028	Thread grabbing origin detection abnormality	Please turn off the power.
E-029	Middle presser foot origin detection abnormality	Please turn off the power.
E-030	Stepper driver communication abnormality	Please turn off the power.
E-031	Stepper motor overcurrent	Please turn off the power.
E-032	Spindle motor encoder Z signal abnormality	
E-034	abnormal current	Please turn off the power.
E-035	IPM frequently overcurrent 1	Please turn off the power.

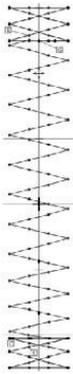
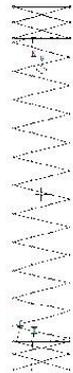
Fault number	Fault name	Reset method
E-036	IPM frequent overcurrent 2	Please turn off the power.
E-037	Motor stalled 1	Please turn off the power.
E-038	Motor stalled 2	Please turn off the power.
E-039	Motor overspeed	Please turn off the power.
E-040	Parking and overflowing	Please turn off the power.
E-041	Motor overload	Please turn off the power.
E-042	Abnormal bus voltage	Please turn off the power.
E-043	The origin of the thread trimming motor is abnormal.	Please turn off the power.
E-044	Head board EEPROM read error	
E-045	Device abnormality	Please turn off the power.
E-046	CRC check error	Please turn off the power.
E-047	Data verification error	Please turn off the power.
E-048	X checksum error	Please turn off the power.
E-049	Y check error	Please turn off the power.
E-050	MD1 step overcurrent	Please turn off the power.
E-051	MD1 X direction has not been completed	Please turn off the power.
E-052	MD1 Y direction has not been completed	Please turn off the power.
E-053	MD2 step overcurrent	Please turn off the power.
E-054	MD2 X direction has not been completed	Please turn off the power.
E-055	MD2 Y direction has not been completed	Please turn off the power.
E-056	Stepper closed loop DSP1 communication error	Please turn off the power.
E-057	Step closed loop DSP1 first channel (X27) overcurrent	Please turn off the power.
E-058	Step closed loop DSP1 first channel (X27) out of tolerance	Please turn off the power.
E-059	Stepping closed-loop DSP1 first channel (X27) overspeed	Please turn off the power.
E-060	Step closed loop DSP1 second channel (X25) overcurrent	Please turn off the power.
E-061	Step closed loop DSP1 second channel (X25) out of tolerance	Please turn off the power.
E-062	Stepping closed-loop DSP1 second channel (X25) overspeed	Please turn off the power.
E-063	Stepper closed loop DSP2 communication error	Please turn off the power.
E-064	Step closed loop DSP2 first channel (X2 1 ) overcurrent	Please turn off the power.
E-065	Step closed loop DSP2 first channel (X2 1 ) is out of tolerance	Please turn off the power.
E-066	Stepping closed-loop DSP2 first channel (X2 1 ) overspeed	Please turn off the power.
E-067	Step closed loop DSP2 second channel (X2 3 ) overcurrent	Please turn off the power.
E-068	Step closed loop DSP2 second channel (X2 3 ) out of tolerance	Please turn off the power.
E-069	Stepping closed loop DSP2 second channel (X2 3 ) overspeed	Please turn off the power.
E-070	Step closed loop DSP2 first channel (X2 3 ) overcurrent	Please turn off the power.
E-071	Step closed loop DSP2 first channel (X2 3 ) is out of tolerance	Please turn off the power.
E-072	Stepping closed loop DSP2 first channel (X2 3 ) overspeed	Please turn off the power.
E-073	Step closed loop DSP2 second channel (X2 1 ) overcurrent	Please turn off the power.
E-074	Step closed loop DSP2 second channel (X2 1 ) out of tolerance	Please turn off the power.
E-0 75	Stepping closed loop DSP2 second channel (X2 1) overspeed	Please turn off the power.

Fault number	Fault name	Reset method
E-07 6	Stepper board 90V power supply overcurrent	Please turn off the power.
E-07 7	Wrong position of lift head	Please turn off the power.
E-07 8	The origin detection of the following intermediate presser foot motor is abnormal.	Please turn off the power.
E-07 9	XY stitch length is too large	Please turn off the power.
E-0 80 ~ 89	Stepper driver upgrade failed	
E-09 0	Query step status timeout	
E-09 1	Stepper driver version error	
E-09 2	Stepper driver model error	
E-093	Step closed loop DSP1 (X25/27) communication data packet verification error	
E- 094	Stepping closed-loop DSP1 (X25/27) communication packet illegal command	
E- 095	Step closed loop DSP2 (X21/23) communication data packet verification error	
E- 096	Step closed loop DSP2 (X21/23) communication packet illegal command	
E- 097	The main control software does not match the motherboard hardware type.	
E- 098	Stepper drive DSP1 curve CRC check error	
E- 099	Stepper drive DSP2 curve CRC check error	
E- 100	The system parameter version changes and all default system parameters are automatically initialized.	
E- 101	Abnormal system parameter range	
E- 102	Motherboard flash data verification error	
E -103	Extended device communication abnormality	
E- 104	The expansion device is operating abnormally	
E- 105	Stepper closed-loop DSP1 (X25/X27) spindle synchronization mode error	
E- 106	Stepper closed-loop DSP2 (X21/X23) spindle synchronization mode error	
E- 254	undefined error	An undefined error occurred in communication

## 2.11 Pattern List

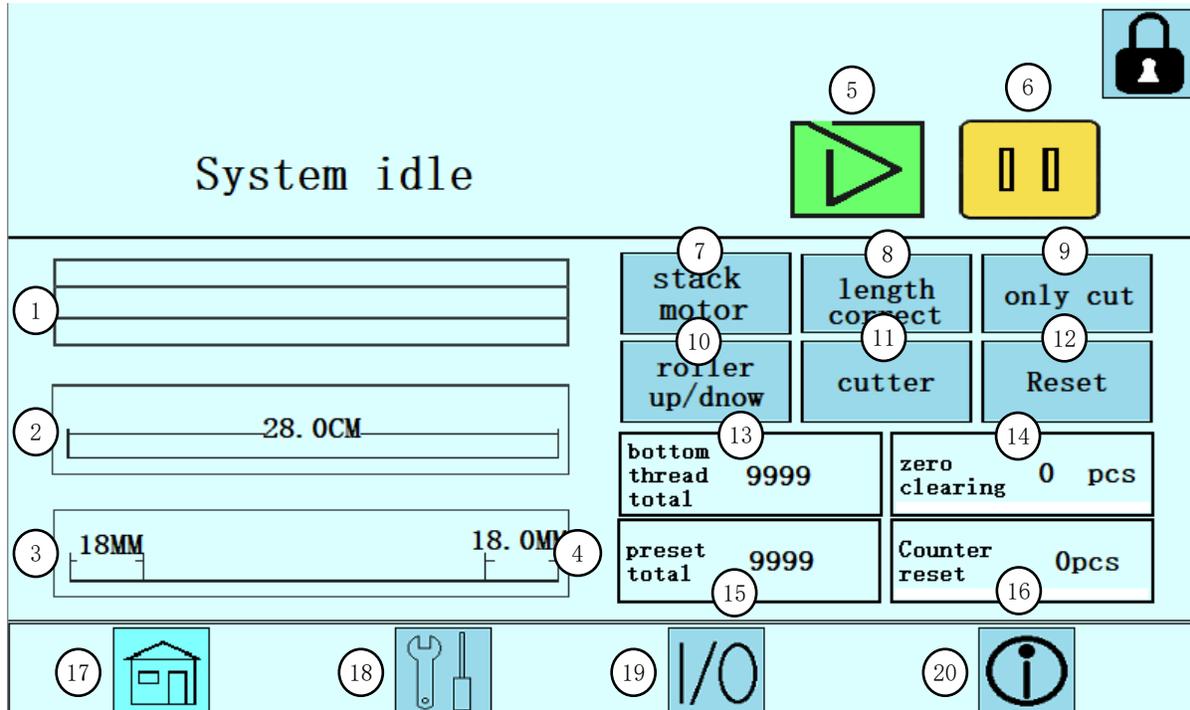
NO	Patterns	Stitch Number	Length × Width (mm)	NO	Patterns	Stitch Number	Length × Width (mm)
920		55	20 × 9	922		61	22 × 9
924		61	24 × 9	926		61	26 × 9
928		67	28 × 9	930		67	30 × 9
932		73	32 × 9	934		73	34 × 9
935		73	35 × 9	937		76	37 × 9

NO	Patterns	Stitch Number	Length × Width (mm)	NO.	Patterns	Stitch Number	Length × Width (mm)
939		76	39 × 9	941		82	41 × 9
943		82	43 × 9	945		82	45 × 9
947		88	47 × 9	949		88	49 × 9
951		100	51 × 9	952		100	52 × 9
953		100	53 × 9	954		100	54 × 9

NO.	Patterns	Stitch Number	Length × Width (mm)	NO.	Patterns	Stitch Number	Length × Width (mm)
955		106	55 × 9	956		106	56 × 9
957		106	57 × 9	958		106	58 × 9
959		112	59 × 9	960		112	60 × 9

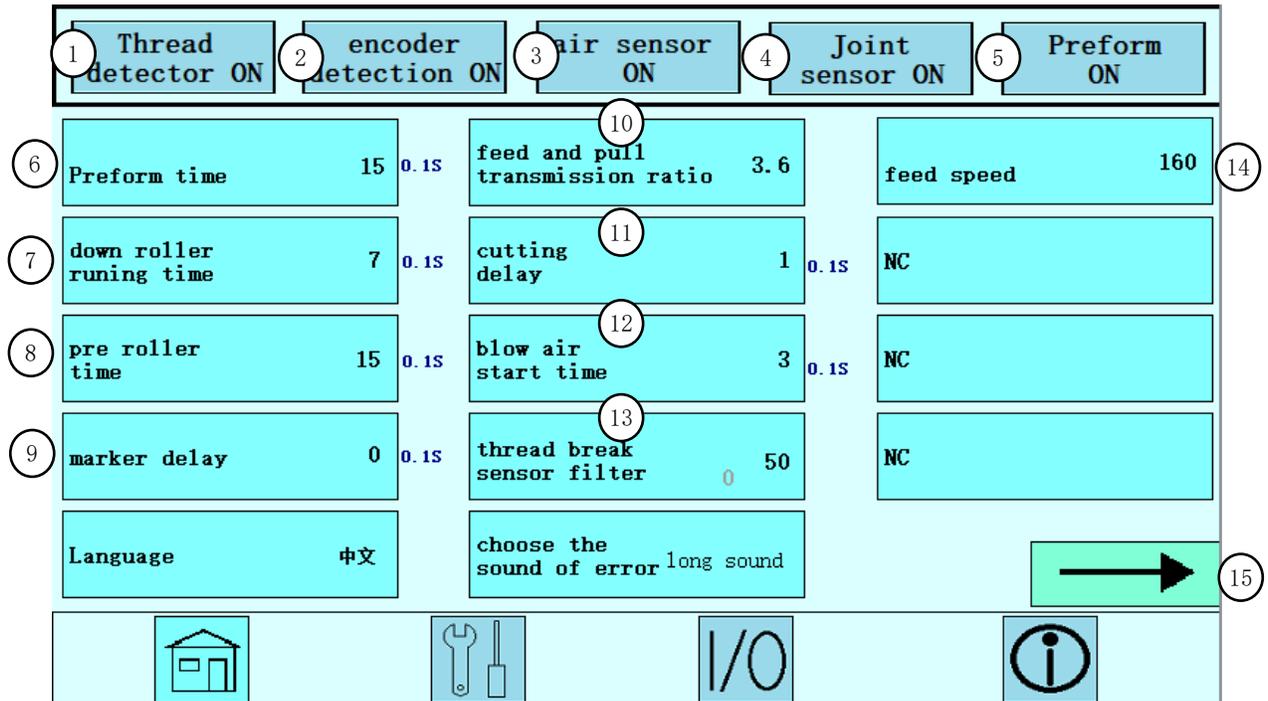
## V、PLC control operation instructions

### 1.Main interface



- 1 Display current operating mode
- 2 The total length of the fabric in the current operating mode (15-999mm)
- 3 Fabric left length setting (15-20mm)
- 4 Fabric right length setting (15-20mm)
- 5 Click the start/stop automatic sewing button
- 6 Click to pause/resume auto-run (Note: Will only pause on push)
- 7 Click the wheel to spin once
- 8 Click to enter the length correction page
- 9 Enter the single cut tape page
- 10 Lifting/lowering of the pressure wheel at the feeding area
- 11 Click to cut once
- 12 When pushed into the waiting state, click to reset to the initial state
- 13 Preset the total quantity that can be sewn on a single bobbin thread(100-500items)
- 14 The remaining sewing quantity of the bobbin thread is displayed. To replace the bobbin thread, you need to click Clear Count to restart counting (actual count)
- 15 Preset the required production capacity quantity, and the operation will stop when it is reached (1-30000 items)
- 16 Current production count display, click to clear the production counter (actual quantity)
- 17 Enter the main page
- 18 Enter the parameter setting page
- 19 Enter the I/O viewing and testing page
- 20 System version information

## 2. Parameter setting interface (1)



- 1 Machine head disconnection detection switch (turning off causes no alarm due to disconnection)
- 2 Length detection switch (Suitable for single-segment mark positioning detection, detecting whether the length between two marks is less than the set length)
- 3 Automatic alarm switch for low air pressure (After closing, the air pressure detection and alarm function becomes invalid)
- 4 Connector detection switch (Note: In no positioning mode only, joint detection will automatically exclude the joint and then resume operation)
5. Heating switch at front setting area
6. Pre-setting and pressing time setting (factory value: 15) unit 0.1s
7. Delay stop time setting of the pre-feeding motor at the bottom of the front setting area (factory value: 7) unit 0.1s
8. Motor delay stop time setting at the top of the front shaping area to prevent discounting (factory value: 15) unit 0.1s
- 9 o' clock pen delay time setting (factory value: 0) unit 0.1s
- 10 Setting the operating speed ratio of the clamping return motor and the feeding motor (factory value: 3.6)
- 11 Cutter cutting delay lift time setting (factory value: 1) unit 0.1s
- 12 Set the delay time to start blowing at the turning point after the turning is completed (factory value: 3) unit 0.1s
- 13 Sensitivity setting of upper thread breakage detection (Note: The larger the value, the higher the detection sensitivity, but false alarms are prone to occur)
- 14 Feeding roller speed setting (factory value: 160)
- 15 next page

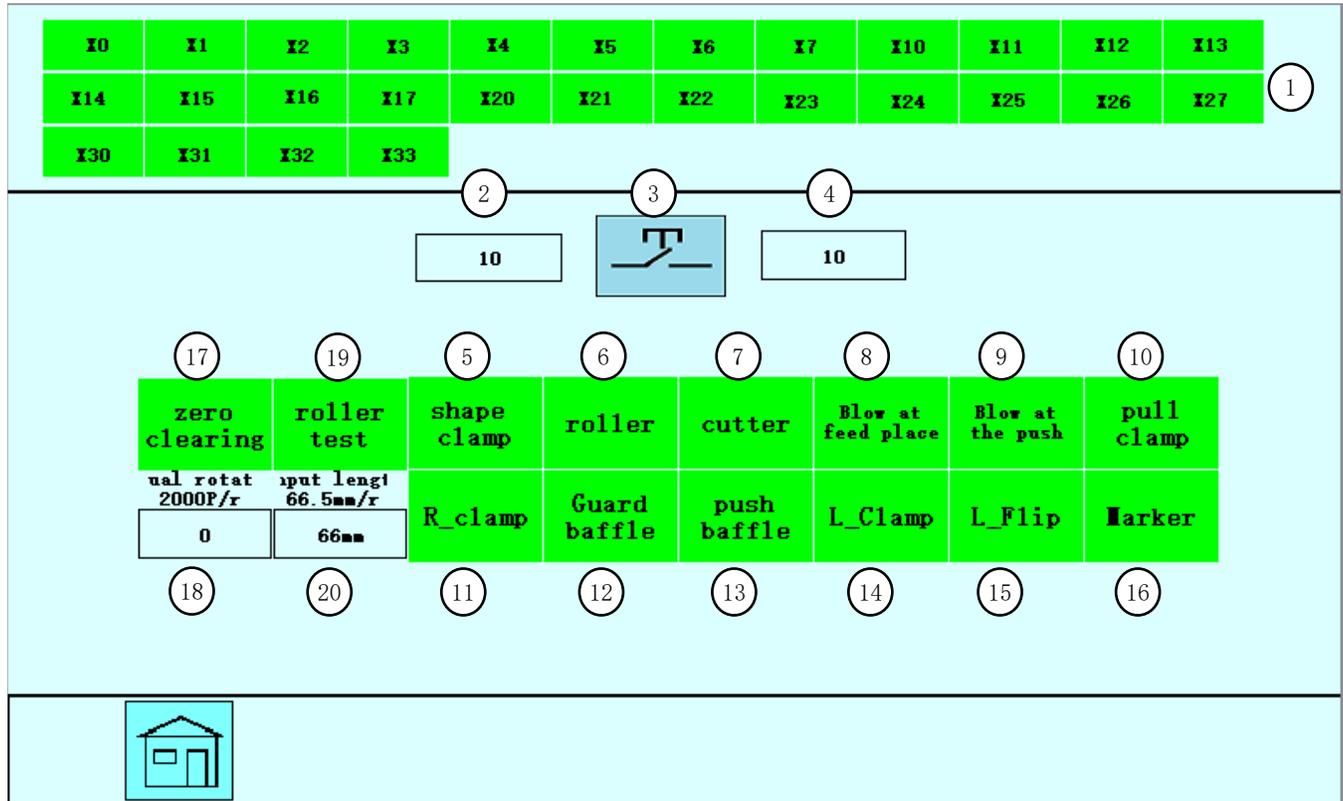
### 3. Parameter setting interface (2)

The screenshot shows a parameter setting interface with the following elements:

- 1** length sensor ON
- 2** Marker OFF
- 3** shield detection distance 5.0 **CI**
- 4** start detection pos 5.0 **CI**
- 5** detection speed 50
- 6** push wait time 3 0.01S
- 7** push waiting distance 30.0 **II**
- 8** push total distance 146.0 **II**
- 9** R\_clamp angle 20.0 **o**
- 10** each bundle output 0
- 11** each bundle qty 5
- 12** NC
- 13** NC
- 14** NC
- 15** NC
- 16** NC
- 17** NC
- 18** NC
- 19** NC
- 20** NC
- 21** NC
- 22** NC
- 23** NC
- 24** NC
- 25** NC
- 26** NC
- 27** NC
- 28** NC
- 29** NC
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- 96** NC
- 97** NC
- 98** NC
- 99** NC
- 100** NC

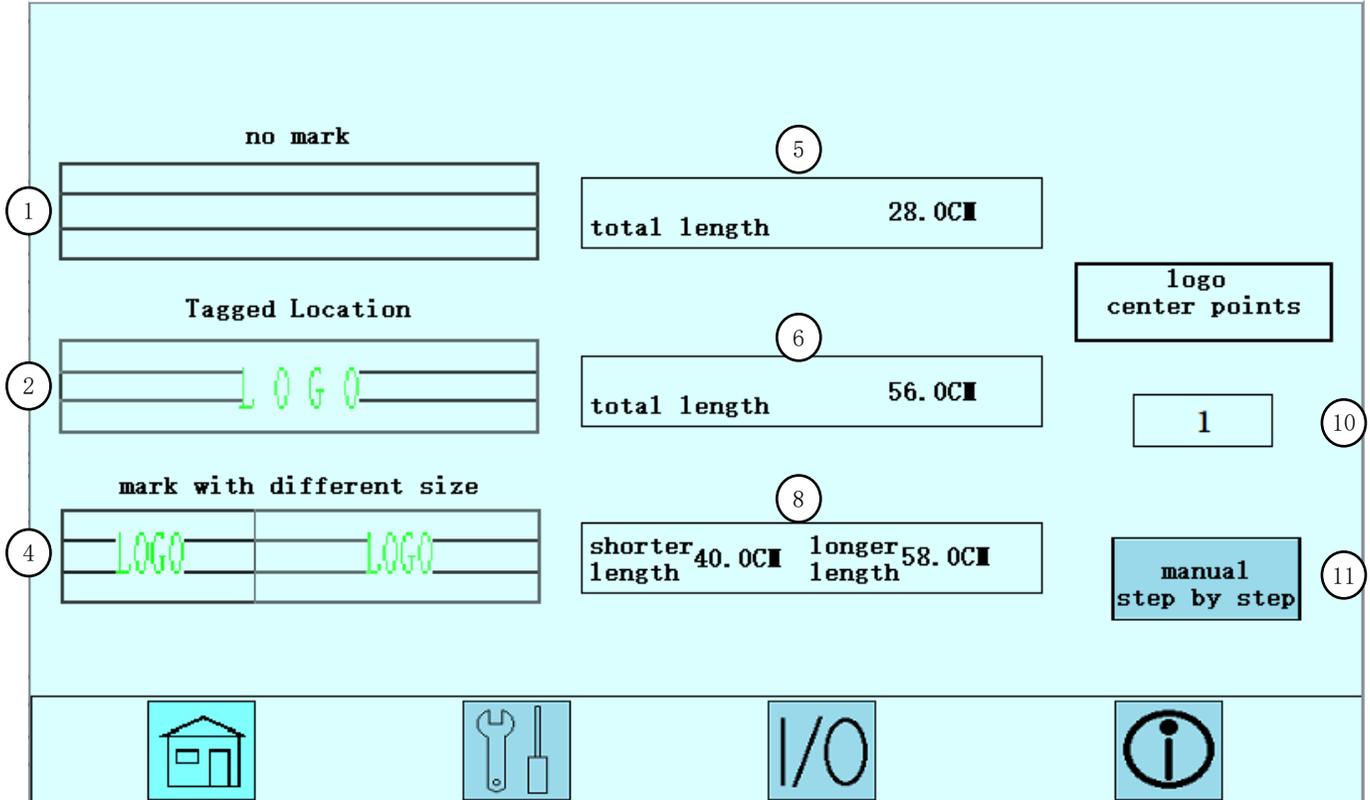
- 1 Check whether the length of the tape feeding length encoder and the feeding roller match the abnormal switch (idling causes the error encoder to be abnormal)
- 2 point function switch (suitable for installing additional point devices)
- 3 Front detection start position (applicable to setting the start detection position of this segment when multiple mark segments appear in two-segment positioning)
- 4 Detection start position (setting of the check position before the end of the current segment)
- 5 The running speed of the detection mark segment (lower speed can position the mark more accurately) Factory value: 50
- 6 Set the waiting time for pushing the component after tape cutting is completed (factory value: 3) unit 0.01S
- 7 Set the distance when the push component is pushed in and waiting (factory value: 30mm)
- 8 Set the total distance of the push-in component (factory value: 146mm)
- 9 Set the tilt angle of the right presser foot that is conducive to the discharging of the material at the beginning of feeding (factory value: 20 degrees)
- 10 Display of the current received material quantity of the receiving rod
- 11 Set the quantity of materials to be collected in each bundle (factory value: 50 items)
- 12 Return to previous page

### 4. I/O test interface



- 1 Input signal viewing (suitable for easy viewing of the page during equipment maintenance and inspection)
- 2 Automatic opening time during manual test output (for continuous on-off mode during manual test output)
- 3 Manual test mode switching, locking mode or continuous on-off mode
- 4 Automatic shutdown time during manual test output (for continuous on-off mode during manual test output)
- 5 Pre-shaping; Shaping cylinder test
- 6 Roller; Feeding roller cylinder test
- 7 Cutting knife; Cutting knife cylinder test
- 8 Feeding air blowing; Feeding place blowing test
- 9 Pushing and blowing air; Pushing and blowing air at the component to test
- 10 Pulling and clamping; Testing of the clamping cylinder of the pulling manipulator
- 11 Right presser foot; Right clamping presser foot cylinder test
- 12 Acceptor plate; Push assembly acceptor plate cylinder test
- 13 Push in the stopper; Push in the stopper plate cylinder test
- 14 Left presser foot; Left presser foot cylinder test
- 15 Left flip; left presser foot flip cylinder test
- 16 point: point function I/O test
- 17 Encoder clear: used to test the feeding encoder value (click to clear parameter No.18)
- 18 is used for testing encoding. Manual rotation can increase the value by 2000.
- 19 Feeding test: Feeding roller motor test  
(Click once to rotate the feeding wheel once, which is normal)
- 20 Numeric input for testing motor length

## 5. Run mode selection interface



- 1 No mark mode; (Only cutting and sewing the set length)
- 2 Single-section positioning mode with logo; (positioning, cutting and sewing of single-section fabric with logo)
- 4 Positioning mode with two lengths of logo; click to enter the setting (cutting and sewing two sections of fabric with logos of different lengths)
- 5 Total length; set the total length of unmarked fabrics
- 6 Total length; set the total length of a single section of fabric with logo
- 8 long section/short section; set the total length of two sections of fabric
10. It can be set to set the number required to align the center point of the mark when there is a mark positioning.
- 11 Click to enter the manual single-step debugging mode (note: this mode can only be entered when the no-mark mode is selected)

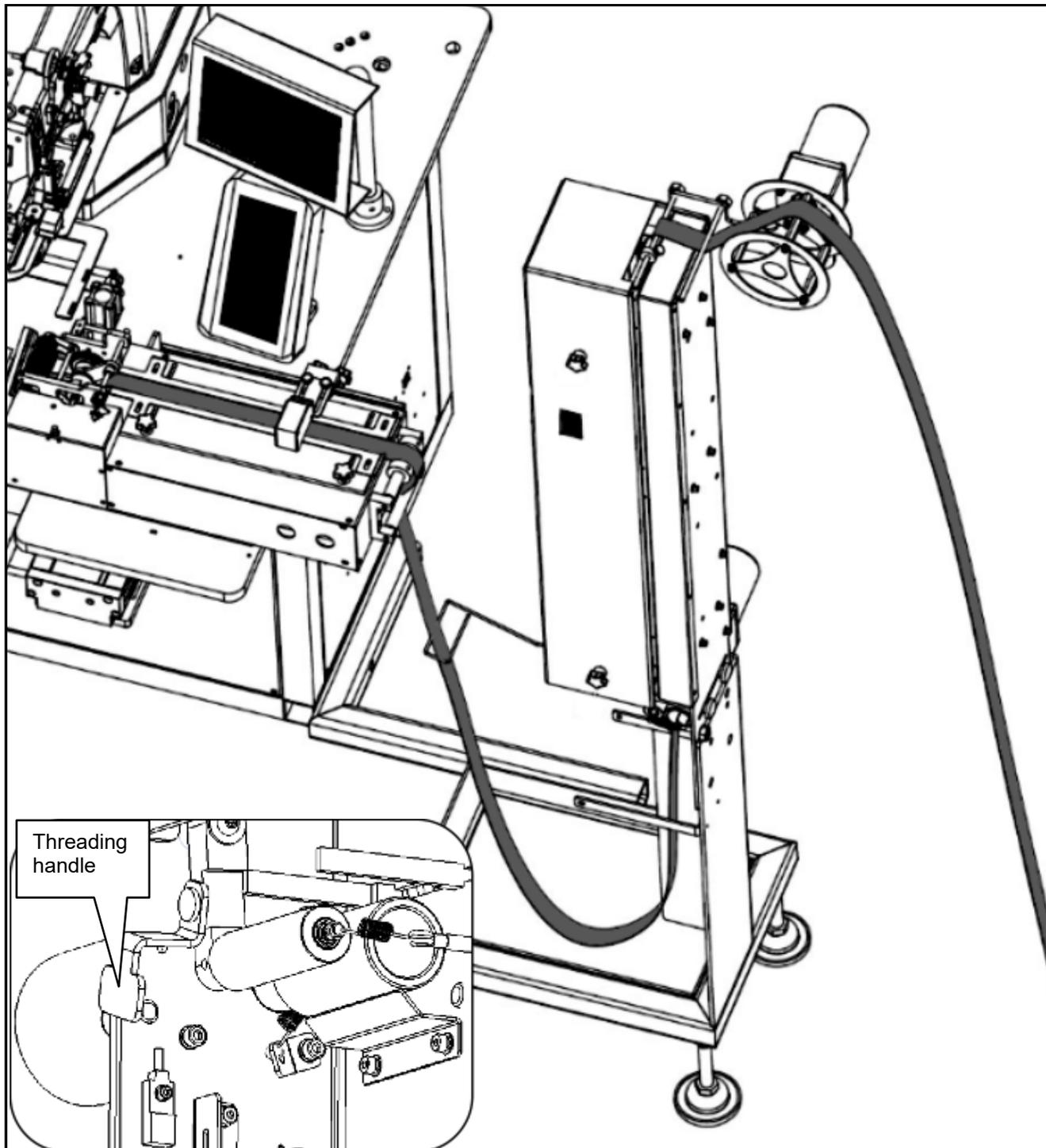
## 6. List of fault codes

Code	Alarm content	Method of exclusion
E-001	has been paused due to abnormal pushing of materials.	Check whether the rubber band on the machine head remains, and then click Return to cancel the pause.
E-002	communication fail	There is a communication failure between the touch screen and the controller. Please check the communication cable between the touch screen and the controller.
E-003	low pressure	The system detects that the pressure is too low. Please check whether the pressure is normal and press the emergency stop button to reset.
E-004	Initialization push motor abnormality	Please check whether the push motor circuit is loose and whether the sensor and touch screen input (X12, X13, X14) addresses jump. Restart the device again.
E-005	Initialization flip motor exception	Please check whether the circuit of the pulling motor is loose. Please shut down the machine and manually turn the motor splint to the vertical downward position before restarting the equipment.
E-006	Initialization pull exception	Please check whether the wire of the pulling motor is loose and whether the addresses of the sensor and touch screen input (X7, X10) jump. Restart again.
E-007	The cutter is not in place	Please check whether there is a jump at the (X32) input when the cutter sensor light is on.
E-008	Motor alarm	Please shut down and restart.
E-009	emergency stop	When the external emergency stop is turned on, please release the emergency stop button and automatically perform reset.
E-010	Bottom line exhausted	The lower thread has been used up. Please check to replace the lower thread and click Return.
E-011	Length encoder error	The length encoder and feed wheel match incorrectly, please check whether the encoder is placed correctly.
E-012	Logo too short	The length between the two LOGO marks is less than the set length. Please check and press emergency stop to reset the device.
E-013	Machine head disconnected	The system detects that the machine head is broken. Please thread the thread and click the page to return.
E-014	Cassette	the elastic band at the pressing frame is smooth and then press the emergency stop to reset the device.
E-015	Connector alarm	The connector has been automatically excluded, please check.

E-016	Running automatically	Please stop automatic operation or press emergency stop to reset the device before entering.
E-017	Output completed	The preset output is completed, click to return to the home page.
E-018	Please turn off all cylinders before returning	Manual test mode is in progress, please close the cylinder and click the return button
E-019	Pushing the component beyond its limit position	The push-in component moves backwards to the left extreme position. Please check the parameter settings and the leftmost switch of the push-in component and restart the device after there are no abnormalities.
E-020	Pushing the component beyond its limit position	The push-in assembly moves forward to the extreme position on the right. Please check the parameter settings and the switch on the far right of the push-in assembly and restart the machine.
E-021	The clamping component exceeds the limit position	The clamping assembly moves backward to the left extreme position. Please check the parameter settings and the leftmost switch of the clamping assembly for no abnormalities and restart the machine.
E-022	Automatic connection failure	The automatic joint passing failed, please check and eliminate it manually.
E-023	The machine head pressure frame is not pressed down	The machine head pressure frame fails to press down. Please check whether the sewing machine head is turned on normally.

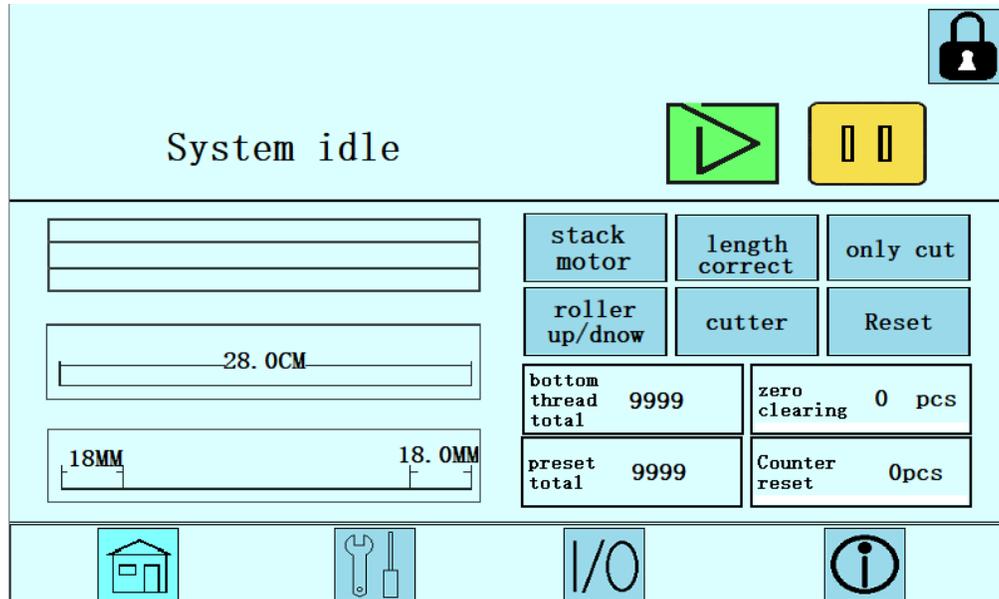
## VI、 Basic operating instructions

### 1. Threading diagram

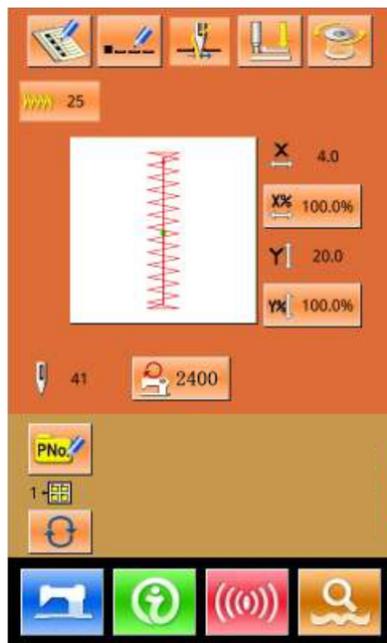


## 2. Manual debugging when starting up for the first time

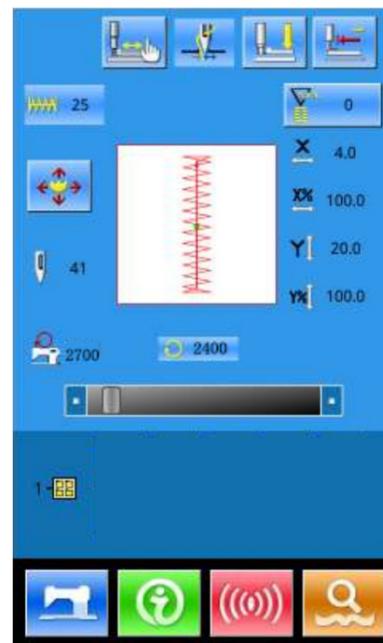
① Turn on the power and wait until the machine starts up to display the main interface.



② Click the screen sewing button on the motor head to enter the sewing interface.

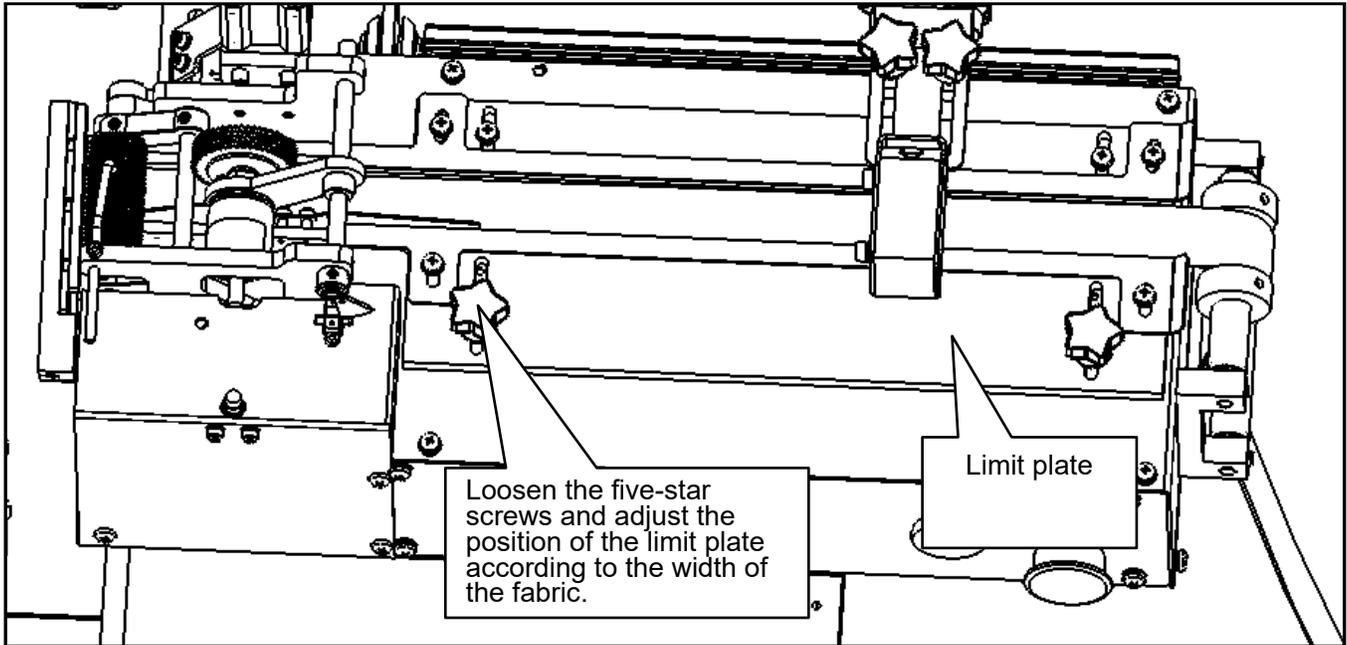


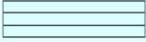
开机界面

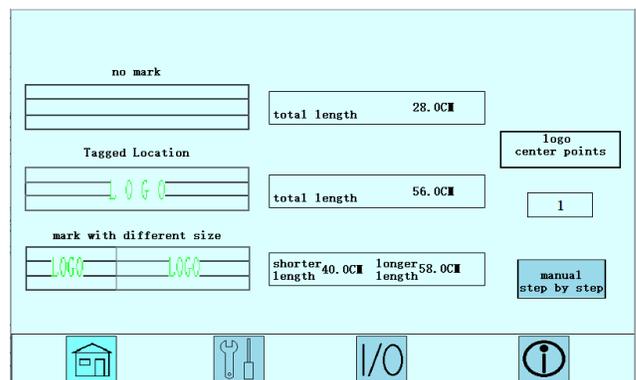
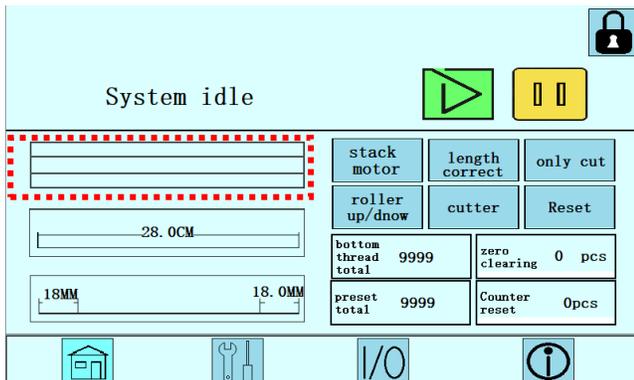


缝制界面

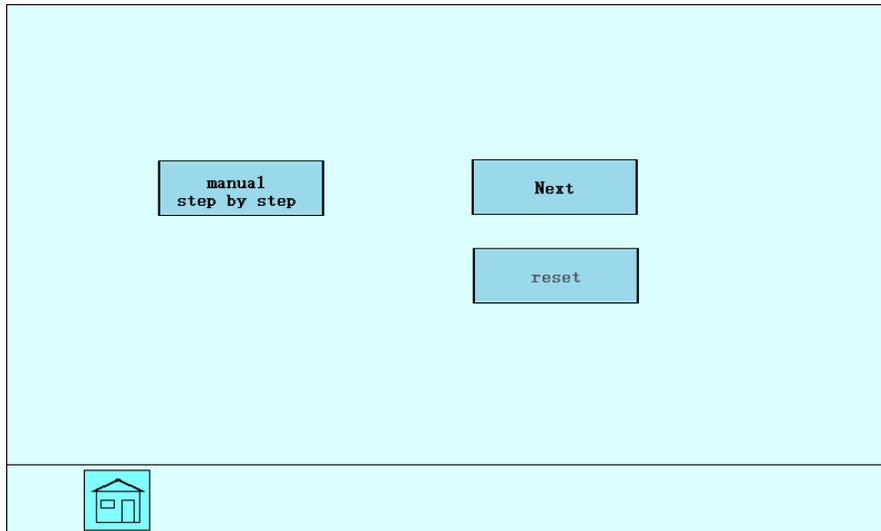
③ Thread the strap according to the strap threading diagram, and adjust the position of the limit plate according to the width of the elastic band.



③ Click the screen button **cutter** to cut off excess fabric, and then click  to enter the mode selection interface.



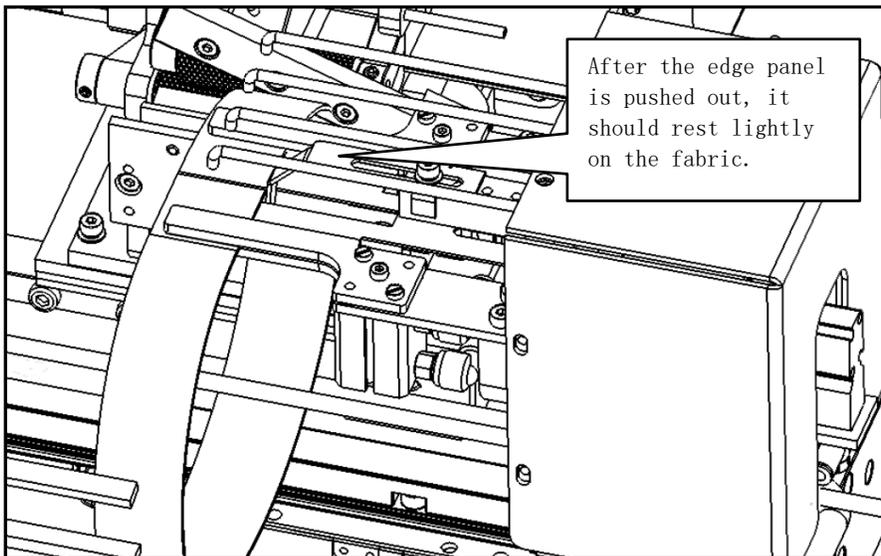
④Click the button **manual step by step** in the mode selection interface to enter the manual single-step test interface.



⑤After clicking the button **manual step by step** turns red to indicate that the function is turned on.

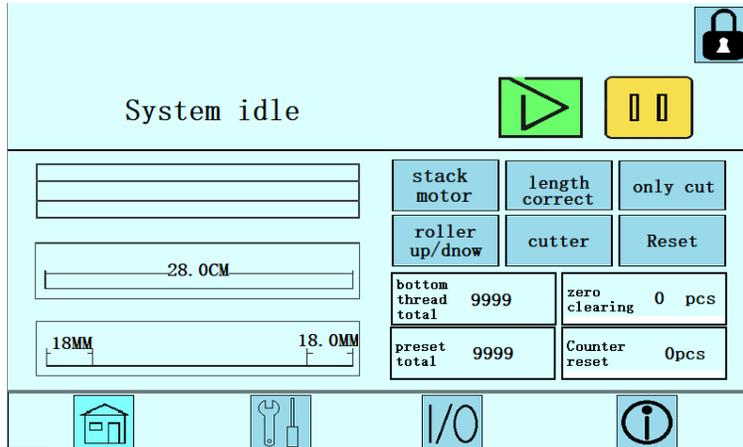
⑥Then click **Next** to start the single-step test until the splicing of the elastic is completed, and press  to return to the main interface.

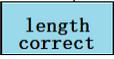
(The purpose of the single-step test is to check the coordinated movement of each component. During the process, the position of the edge panel needs to be adjusted according to the width of the fabric)

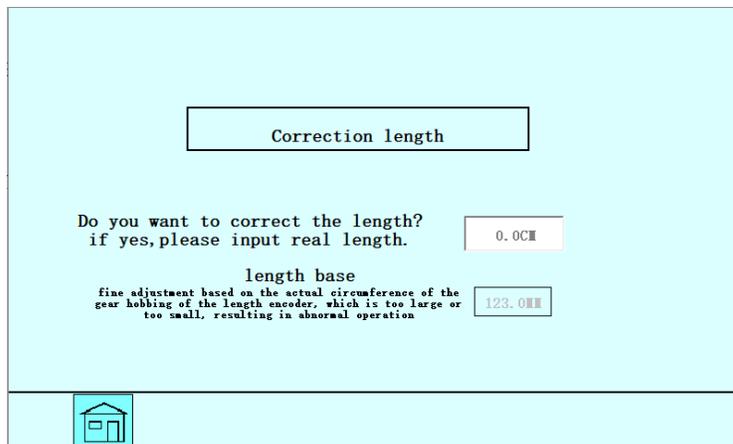


### 3.Elastic band length correction

- ①Click on the screen  to enter the length of the rubber band.
- ②click button  Wait until the button turns red before clicking it  Perform rubber band feeding and flipping action.
- ③After clicking the button  each component is reset and the length of the fabric is measured.



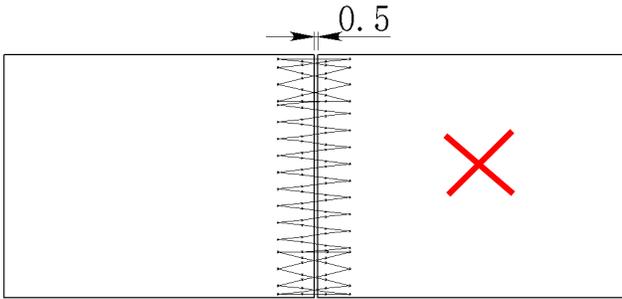
- ④Click button  to enter the correction length interface.
- ⑤Click the button  to display a numeric input box. Fill in the actual measured length and press OK to exit.
- ⑥Click button  to return to the main interface.



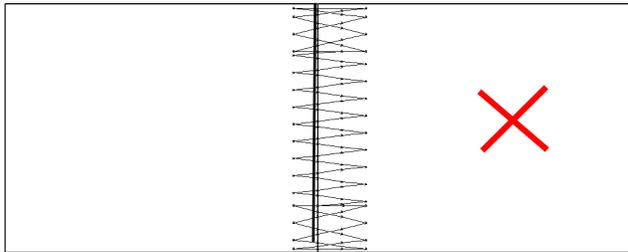
4. Adjust the left and right position of the elastic seams

①Click button  and wait until the button turns red, then click button  to splice the rubber band.

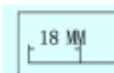
②Determine whether the length of the elastic bands at the left and right ends is qualified based on the splicing conditions of the elastic bands.



(Seams too large, Increase the length of the left or right end by 0.5mm)

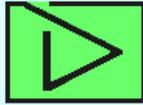


(The splicing seam is to the left, increase the left section by 1mm, and decrease the right end by 1mm.)

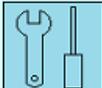
③Click the buttons  or , and the numbers on the left and right sides can adjust the length of the left and right ends.



## System idle



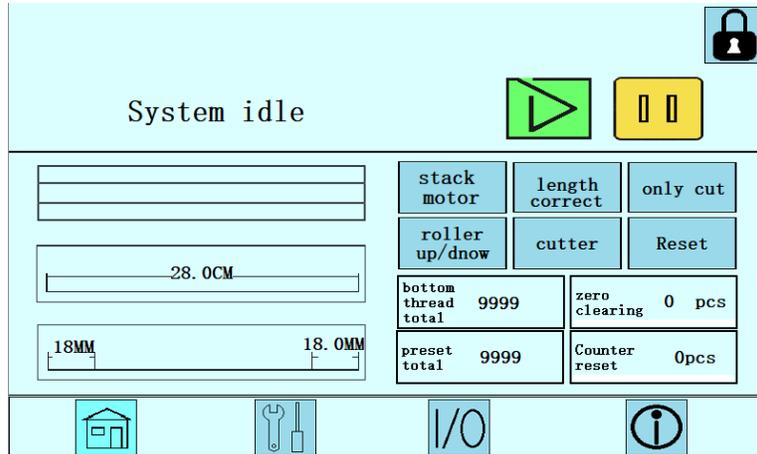

	stack motor	length correct	only cut
28.0CM	roller up/dnow	cutter	Reset
<div style="display: flex; justify-content: space-between; width: 100%;"> <span style="border: 2px dashed red; padding: 2px;">18MM</span> <span style="border: 2px dashed red; padding: 2px;">18.0MM</span> </div>	bottom thread total 9999	zero clearing 0 pcs	
	preset total 9999	Counter reset 0pcs	

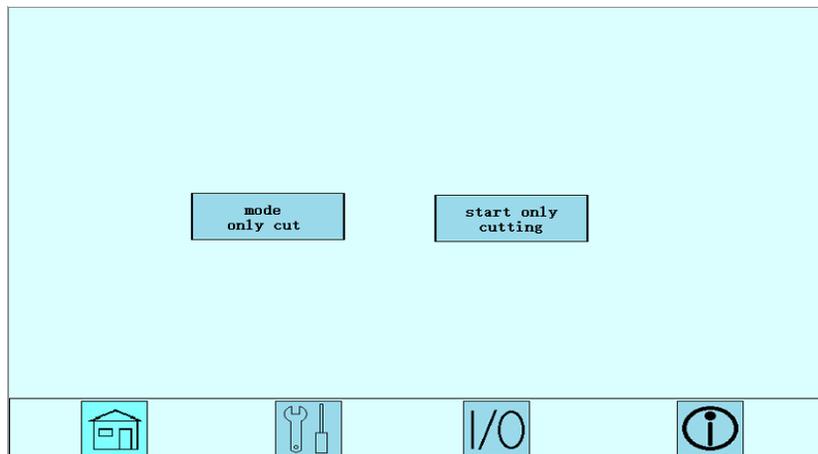


### 5. Instructions for use of single cutting belt function

① Click the button **only cut** on the screen to enter single cutting mode.  
 (Set the length of the elastic band before entering the single-cut band mode)



② Click the **only cut** button and wait until the button turns red. Then click **start only cutting** to start automatic tape cutting.



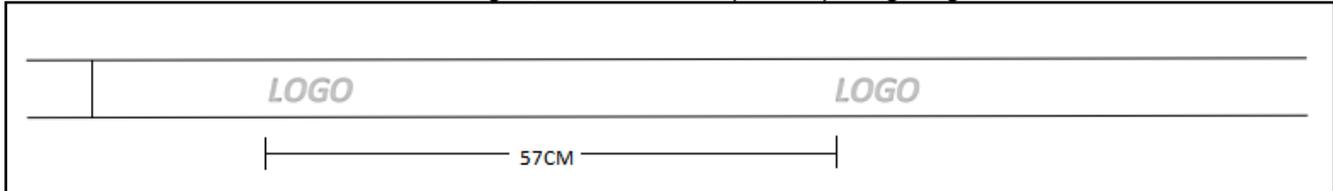
③ After cutting is completed, click the button  to return to the main interface.

## 6. Instructions for using flag mode

The logo positioning function is a function specially developed for underwear manufacturers, This function can position a specific LOGO at any position within the specified length for splicing or center the LOGO for splicing.

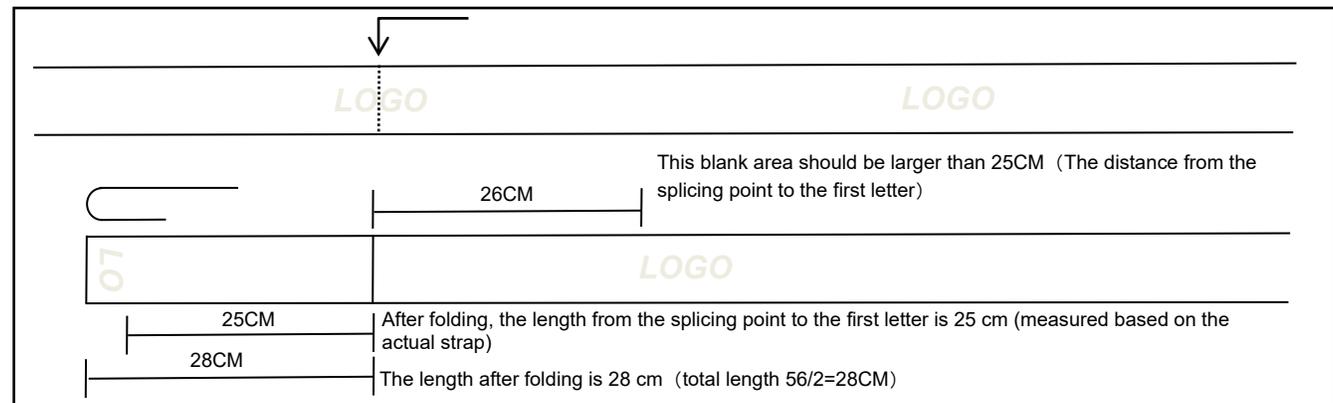
### 6.1 Instructions for use with logo positioning function (for the first point of LOGO):

① Confirm the distance between the logos, such as the required splicing length of 56CM.



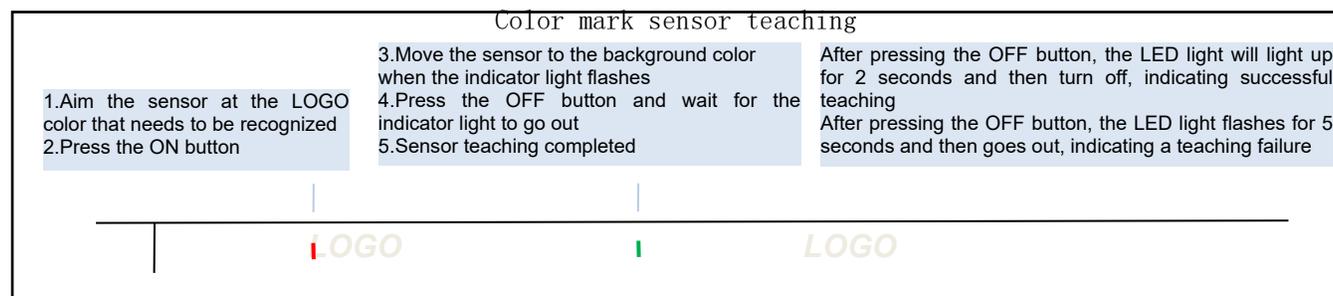
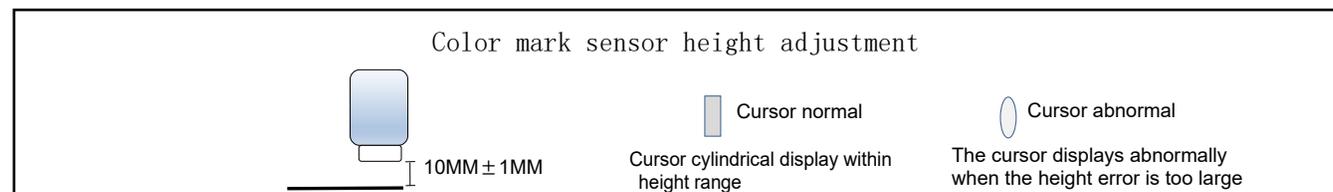
Measure the distance between the LOGO on the elastic band. The distance between the two LOGO cannot be equal to or less than the actual required length. The elastic band should be reserved for cutting length. For example, add 1CM to the required length for center cutting, if the distance is less than the actual required length, the machine will not work.

② Fold the elastic band in half from the position that needs to be positioned as shown below: Take the LOGO in the center and the length: 56CM as an example.

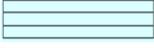


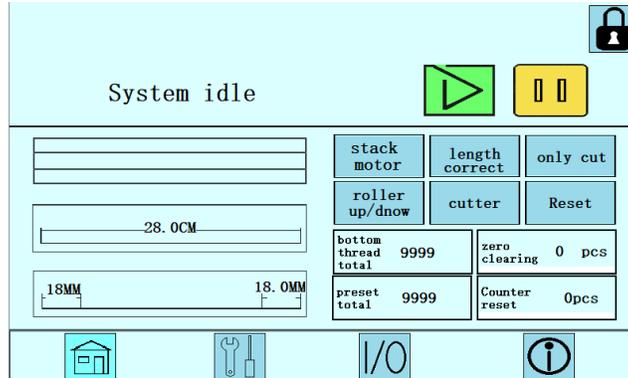
③ Adjust the color sensor to the 25CM position of the ruler on the workbench, The first letter of the elastic band logo should be on the right side of the sensor (cannot go past the sensor).

④ Color mark sensor height adjustment and teaching:

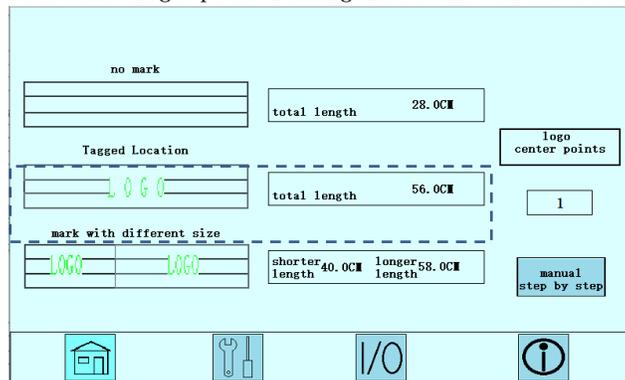


6.2 There is a logo positioning function (for the first point of the LOGO) operation instructions

①Click  to enter mode selection



②Click  to select the logo positioning mode and enter 56CM in the rear input box.



③Click  to return to the main interface.

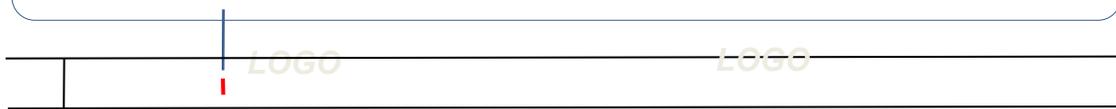
④Click button  and wait until the button turns red, then click button  to perform the rubber band feeding and flipping action.

⑤After clicking the button , all parts are reset, and then take out the newly cut elastic band and check whether there is any deviation.

(The logo is not centered, the center point is to the left. The color mark sensor can be moved appropriately to the right. The center point is to the right. The color mark sensor can be moved appropriately to the left.)

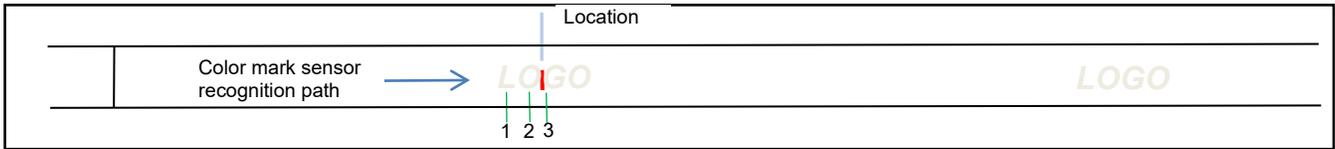
⑥Then click the button  to start operation.

(Note: Each time you click the button , before starting the marked positioning mode, requires manual movement of elastic bands. Place the color sensor cursor in a blank space without a LOGO, The first letter to be recognized should be to the right of the color mark sensor cursor)



6.3 Instructions for use with logo positioning function (for LOGO center point)

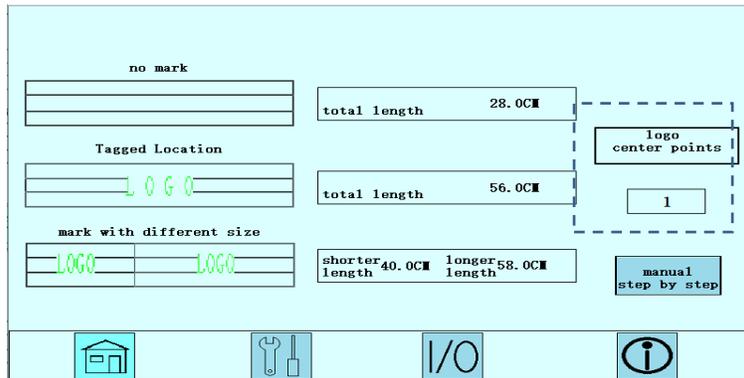
The logo positioning mode is adapted to the function of positioning the LOGO center point.



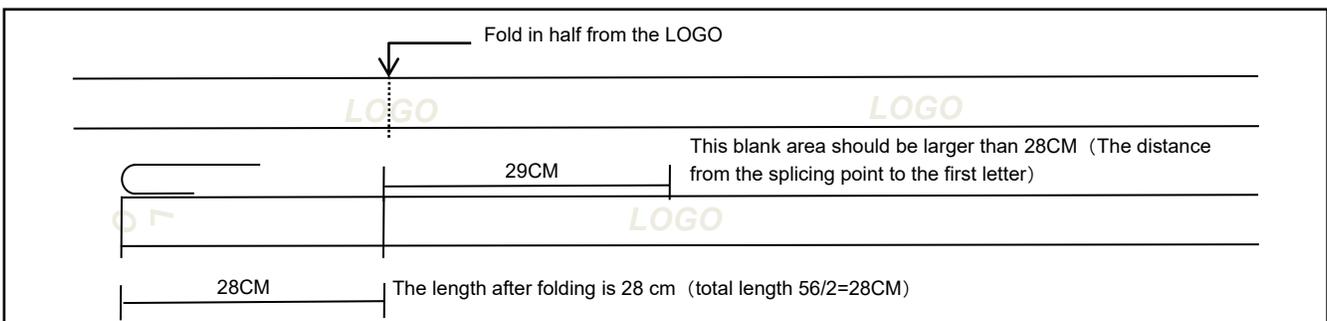
Since the length of the LOGO will change during the production and shaping process of the elastic band, as shown in the figure above, specify the positioning point at the third point in the LOGO. The closer the positioning point is to the center point, the stronger the positioning stability and the less susceptible it will be to rubber. The shaping problem of the ribs affects the position of the LOGO at the center point of the rubber bands.

Operation steps:

- ①Color mark sensor identification teaching (Refer to above)
- ②When the LOGO is on the right side of the color mark sensor, (The color sensor light is projected on the blank space in front of the LOGO) pull the elastic band from right to left with your hands until it reaches the target position, and observe and record the number of times the color mark sensor flashes during this process. Enter the recorded number of times into the box below logo center points.



- ③Fold the elastic band in half from the position to be positioned as shown below: Take the LOGO in the center and length 56CM as an example.



- ④Adjust the color sensor to the 28CM position of the workbench ruler. The first letter of the rubber band LOGO should be on the right side of the sensor (cannot cross the sensor).

- ⑤Then click the button ▶ to start running.

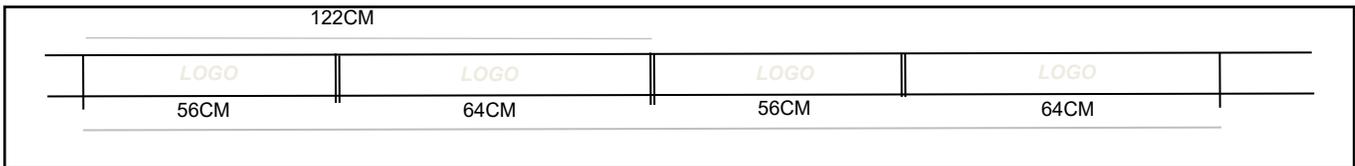
(Before starting the mode with a logo, move the rubber band and place the cursor in a blank space without a logo, as shown in the previous text)

### 6.4 Instructions for using the double-size function with logo

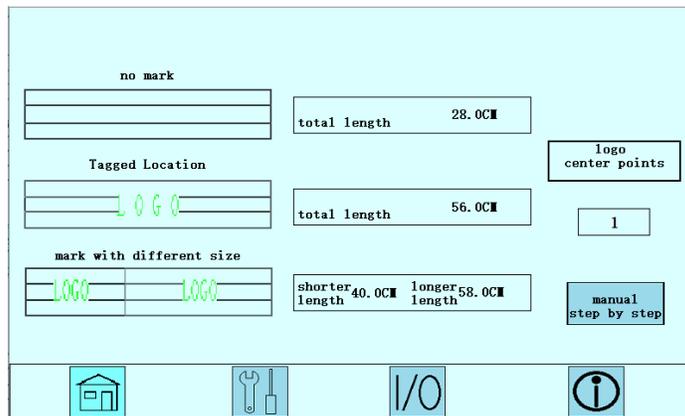
The multi-section mode with logo is an extension of the logo positioning function. It can cut two elastic bands of different lengths from the same style of elastic band with logo.

Example:

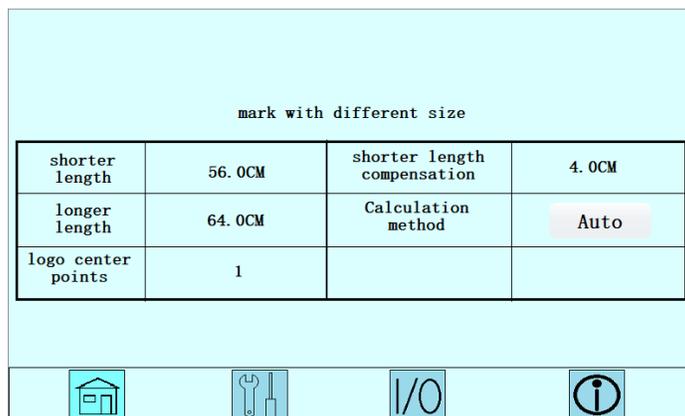
- ① If you need to cut 2 lengths of elastic bands, each length is as follows: 56CM、64CM。
- ② By matching the two lengths, we can get  $56\text{CM}+64\text{CM}=120\text{CM}/2=60\text{CM}$
- ③ Coupled with the 2CM reserved distance in the center, only 62CM is needed. It turns out that two lengths of elastic bands need to be customized. By matching the large and small sizes, one length of elastic band can be cut into two different sizes in one go. length. (In order to consider the length stability, the difference between the two lengths should not be too large, and the difference is preferably within 10CM)



④ After entering the mode selection interface, click the key   to enter the multi-segment setting interface.



⑤ Click the short length input box to enter a shorter tape length, Click the length input box to enter the longer strap length.



⑥ First segment position correction:

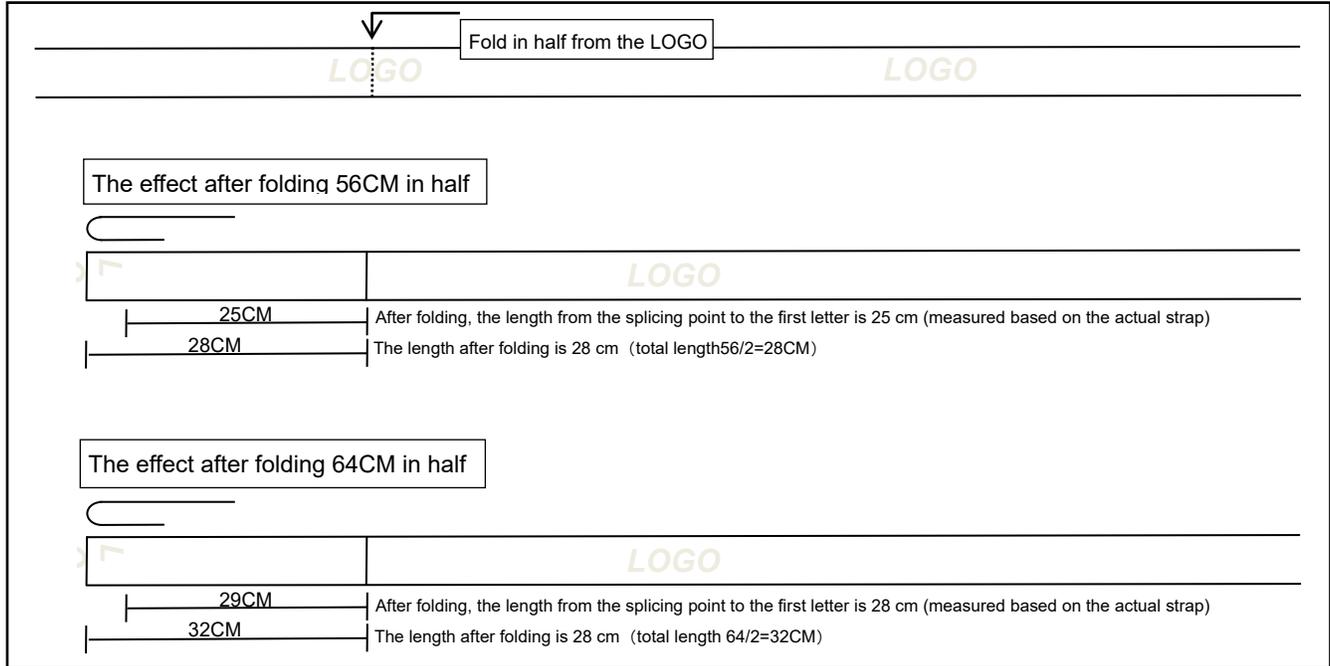
a. Corrected filling method selection button **Auto**, The first paragraph position correction will be automatically filled in.

b. Correct filling method selection button **Manual**, The first position correction requires manual input.

(The calculation method is as follows:  $64\text{CM} - 56\text{CM} = 8\text{CM} / 2 = 4\text{CM}$ , Fill in last 4CM)

⑦ First segment position correction diagram:

a. Fold the elastic band in half from the middle of the LOGO as shown below:



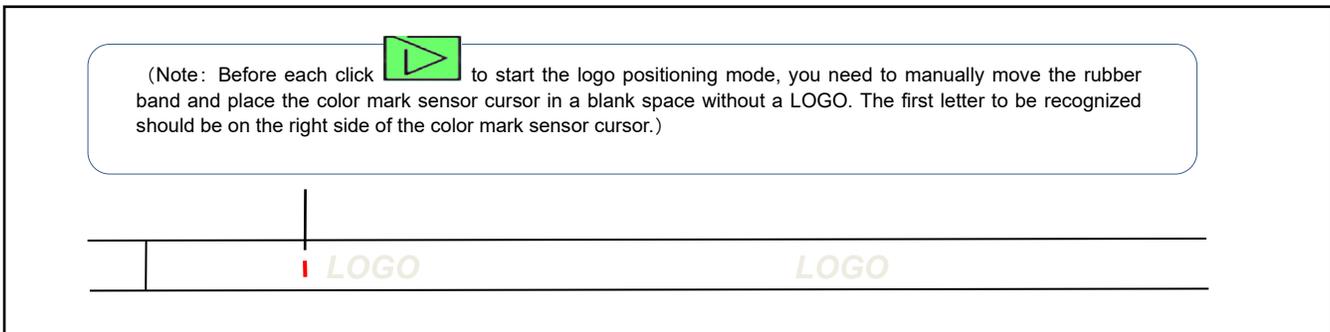
b. As shown in the picture above, after the two lengths are folded in half, the length of the second section is 4CM longer than the first section, so the value 4 must be entered in the correction of the first section. The computer will automatically correct the length of the first section when it detects the mark.

c. Teaching and positioning of color mark sensors

For the color mark sensor teaching diagram, refer to the above

The positioning position of the color mark sensor needs to be positioned using a long length. As shown in the picture above, adjust the color mark sensor to the position of 29CM on the scale on the workbench. .

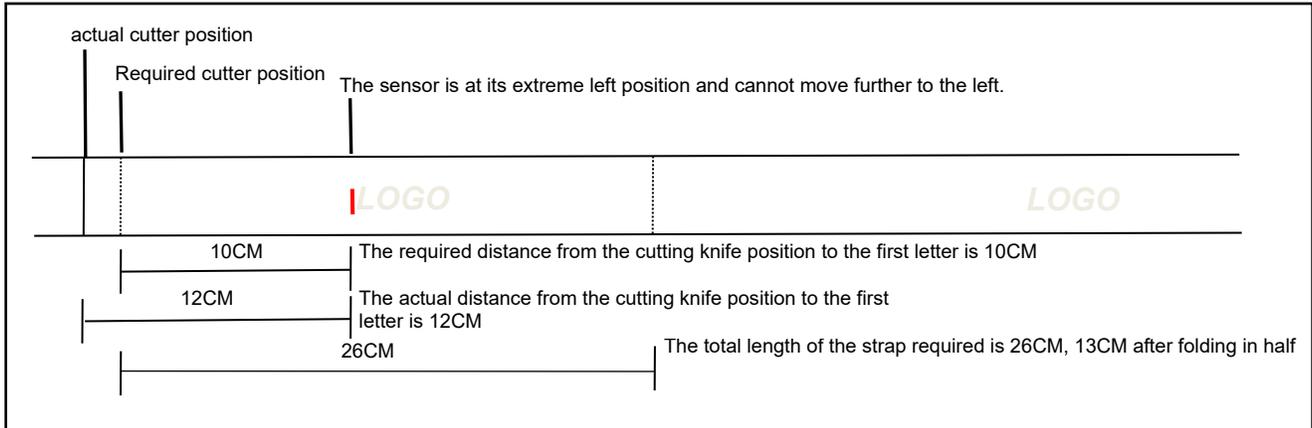
⑧ Then click the button  to start running.

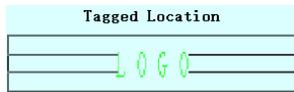


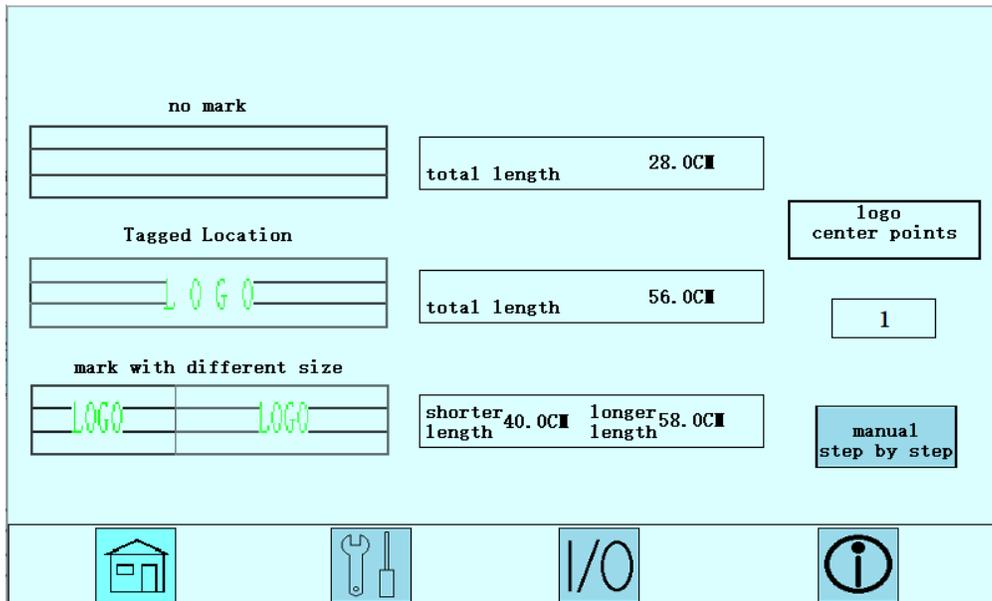
### 6.5 Instructions for compensation function in single size mode with logo

This mode is suitable for mark position offset and is used when the left limit detection position of the sensor is exceeded.

Examples are as follows:



①Click the button  to enter the detailed settings page.

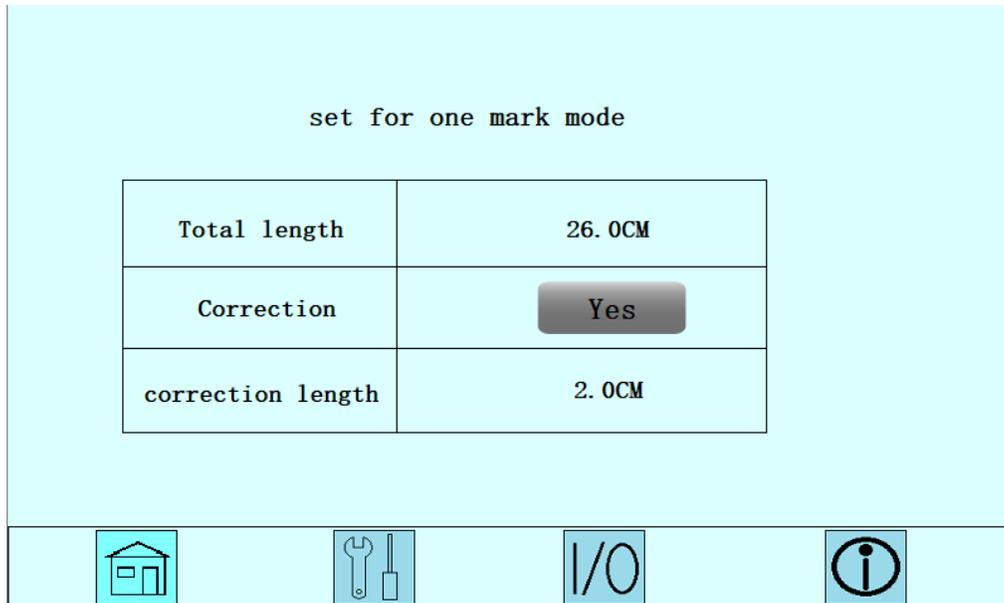


②As shown above:

a. Since the sensor has moved to the extreme position to the left, the actual cutter position is 12CM from the first letter on the left side of the logo, which exceeds the cutter length we need.

b. The cutter position we need is located 10CM from the first letter on the left side of the LOGO, which is still 2CM away from the actual cutter, so we need to fill in 2CM at the

correction length of the sensor and let the color sensor detect the first letter. Run the rear cutter 2CM forward.



③Then click the button to start running.

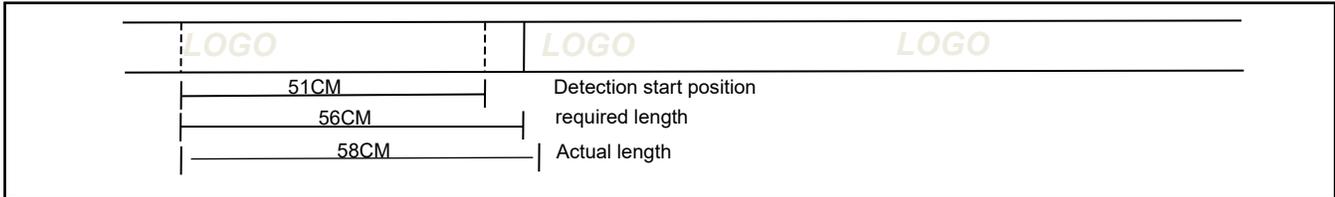
(Note: Before each click to start the logo positioning mode, you need to manually move the rubber band and place the color mark sensor cursor in a blank space without a LOGO. The first letter to be recognized should be on the right side of the color mark sensor cursor.)

### 6.6 Notes on mark positioning function

When there are multiple LOGO on a rubber band, you can use the three functional parameters of "front detection start position", "detection start position" and "length detection" to assist detection.

①Example: It is necessary to cut a length of 56CM, and the actual length of the elastic band is 58CM. The "detect starting position" function is to prevent the machine from automatically stopping when the length between the two LOGOs of the elastic band is less than the set splicing length during the splicing process. Phenomenon. For example: the detection start position is set to 5CM, the detection start position calculation method is: the set length is 56CM, the detection start position is 5CM, and the "length detection" function is turned on (56-5=51CM), the detection start position will be on the left side of the elastic band Start

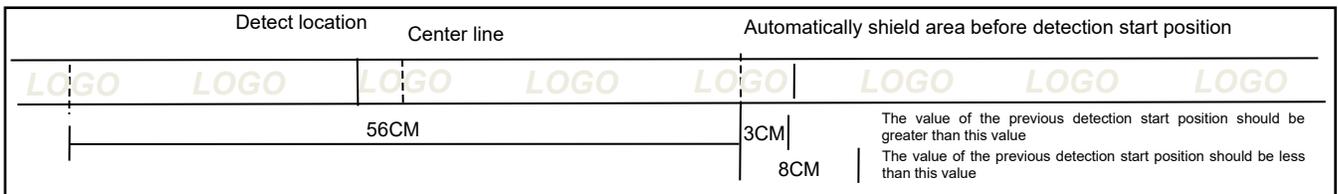
counting to 51CM and start detecting whether there is a LOGO in the elastic band. If LOGO is detected between 51CM and 56CM, the machine will judge that the length is insufficient and display that the actual length is less than the set length.



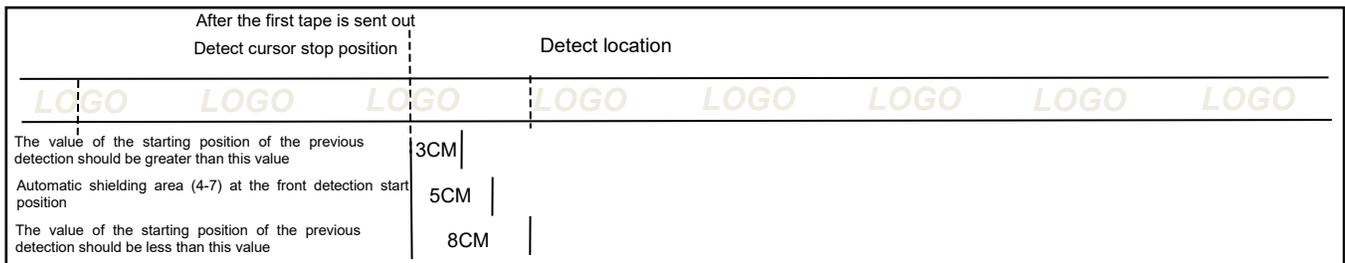
②Example: The setting of the multi-mark elastic band in the "mark positioning" mode requires a length of 56CM.

- a. Turn off the "length detection" function.
- b. Measure the distance from the logo on the right to the blank space.

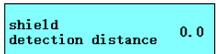
First belt



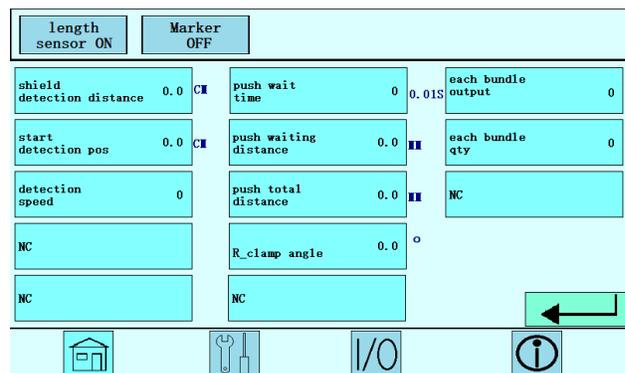
First belt work completed



③Enter a value no less than 3CM in button



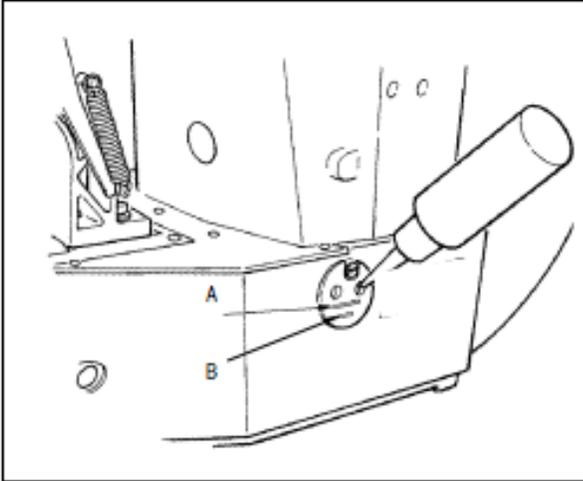
Note:Pre-detection start position, The machine will automatically block the distance of the detection signal at the beginning of each section of tape. After setting, pay attention to the detection distance.



## VII、 Repair

### 1 Sewing machine head maintenance and repair

#### 1.1 How to refuel the sewing machine head

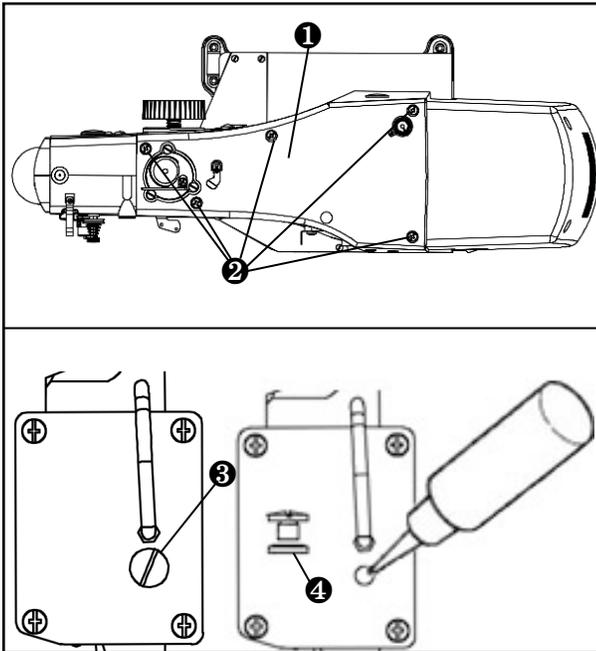


Please confirm that the engine oil is between the lower line B and the upper line A. If the engine oil is too low, please use the attached oiler to refill it.

\* The oil tank for refueling is only for refueling the hook. When using low speed, if the amount of oil in the rotary hook is too much, you can reduce the amount of oil.

#### Note!

When using the sewing machine for the first time or when you have not used the sewing machine for a long time, please add a small amount of machine oil to the hook before using the sewing machine.

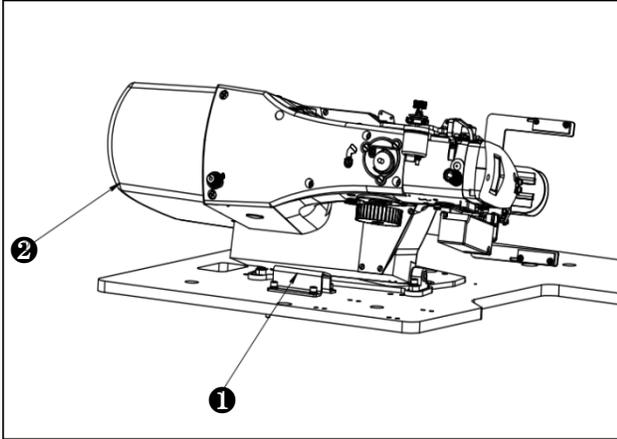


**Note:** Please add L-CKC100 gear oil before using the new machine.

As shown in the figure, please remove the 5 screws ② on the upper cover ① and open the upper cover ①. Then remove screw ③. Note that there is an oil seal ④ under screw ③. Then add gear oil into the hole. Please fill up the 150ml gear oil on the oil bottle. Then install oil seal ④ onto screw ③ and tighten it. Reinstall upper cover ① and tighten screws ②.

## 1.2 How to tilt the sewing machine head

When lowering and lifting the sewing machine, be careful not to get your fingers caught in the sewing machine. At the same time, in order to prevent unexpected accidents caused by sudden starting, please turn off the power before operating.



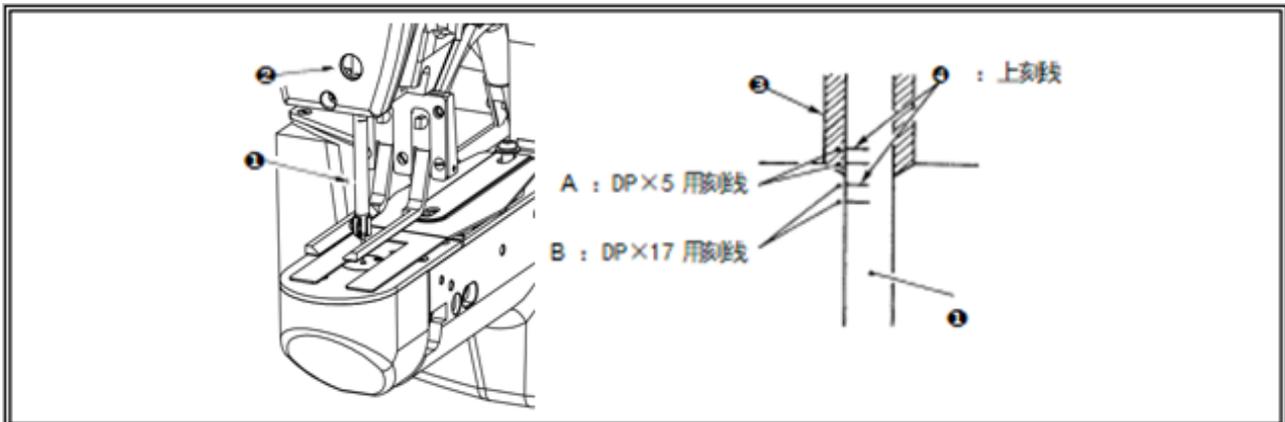
When lowering the machine head, please slowly lean the machine head against the machine head support ①.

### Note!

1. Before placing it down, please confirm whether the machine head support ① is installed on the machine.
2. When lifting the sewing machine, please do not move the motor cover ② to lift the machine head, otherwise the motor cover ② may be damaged.
3. To prevent the machine from tipping over, be sure to operate it on a flat place.

## 1.3 Needle bar height

**Warning:** In order to prevent personal accidents caused by sudden starting, please turn off the power before operating.



Set needle bar ① to the lowest point, loosen needle bar fastening screw ②, and adjust the needle bar upper score line ④ and the lower end of needle bar lower stopper ③ to be consistent.

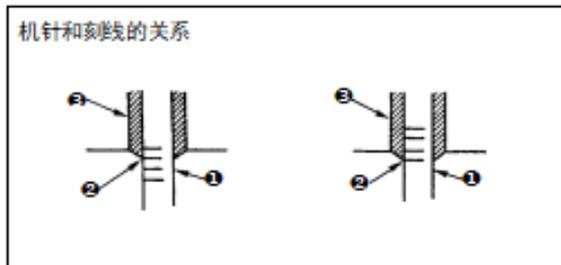
### Note!

After adjustment, please make sure there is no looseness.

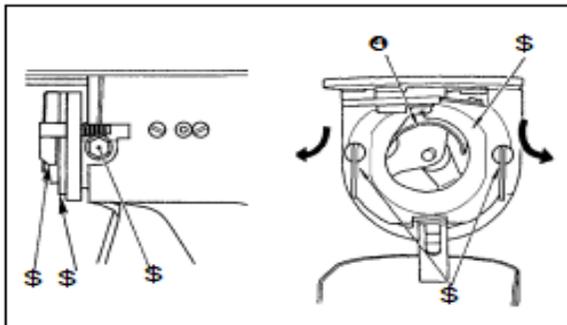
\*If stitch skipping occurs during sewing, please adjust downward 0.5 ~ 1mm from the engraved line ④ on the needle bar.

## 1.4 Needle bar and hook

**Warning:** In order to prevent personal accidents caused by sudden starting, please turn off the power before operating.



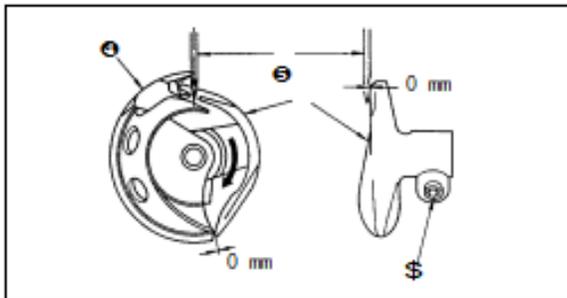
1. Turn the pulley by hand. When needle bar ① rises, align lower engraved line ② with the front end of needle bar lower stopper ③.



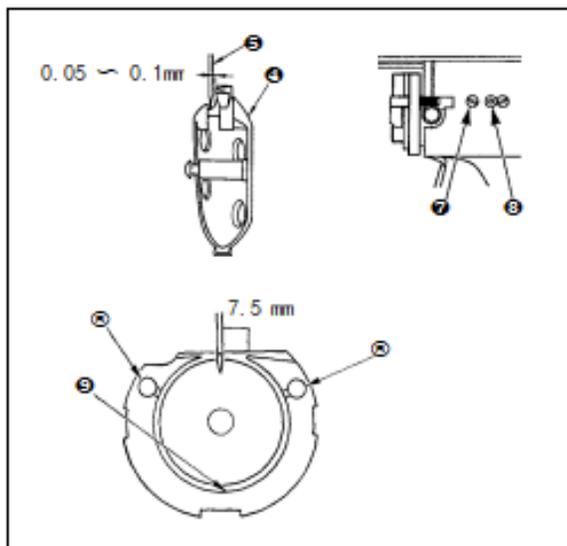
2. Loosen the driver fixing screw\$, open the middle hook presser left and right, and remove the middle hook presser foot\$.

**Note!**

At this time, please be careful not to fall off the middle hook ④.



3. In order to make the tip of hook ④ consistent with the center of needle ⑤ and to prevent the front end surface of driver ⑥ from colliding with the needle and bending the needle, please adjust the gap between the front surface of driver ⑥ and the needle to 0mm. Then tighten the drive fixing screw \$.



4. Loosen the large hook fixing ⑦, turn the large hook adjusting shaft ⑧ left and right, adjust the front and rear position of the large hook, and adjust the gap between the needle ⑤ and the hook tip of the middle hook ④ to 0.05 ~ 0.1mm.

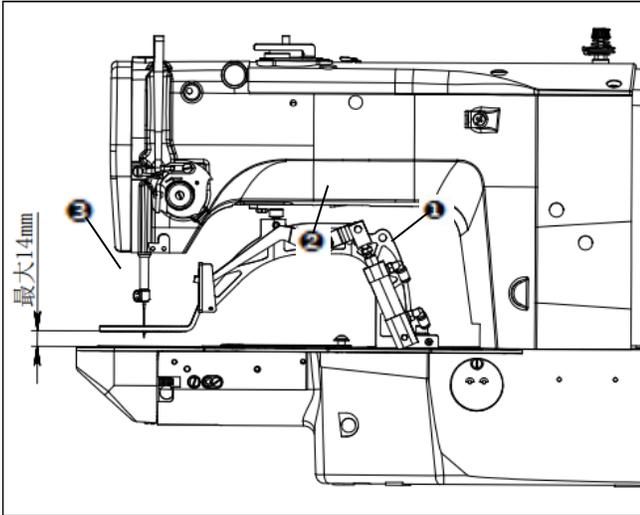
5. After adjusting the front position of the large hook, the gap between the needle and the large hook should be 7.5mm, then tighten the large hook fixing screw ⑦.

**Note!**

If the machine has not been used for a long time, or after cleaning the area around the hook, add a small amount of engine oil to the hook loop ⑨ and felt pad ⑩ before use.

## 1.5 Presser foot height

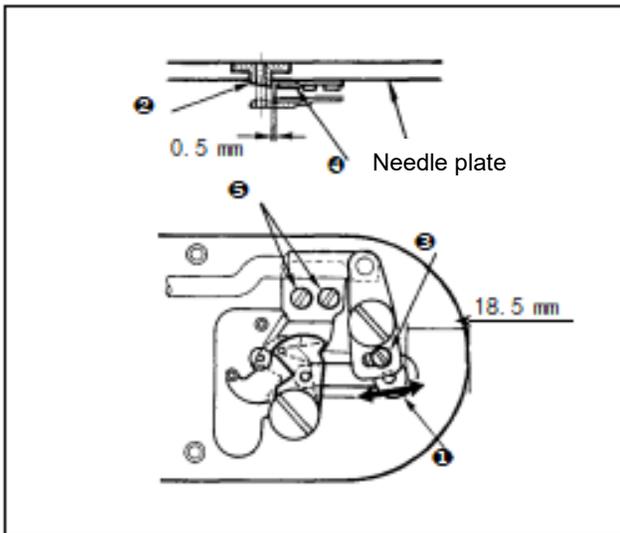
**Warning:** In order to prevent personal accidents caused by sudden starting, please turn off the power before operating.



1. When cylinder ① is in the retracted state, loosen bolt ②.
2. Lift or press down presser foot ③ to adjust presser foot height.
3. After adjustment, tighten bolt ② securely.

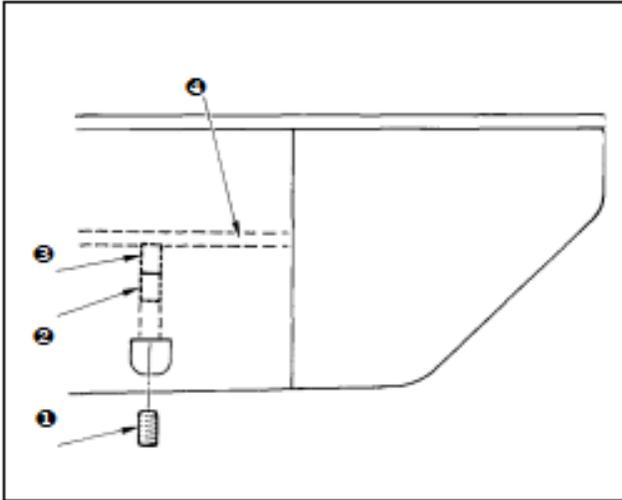
## 1.6 Mobile and fixed knives

**Warning:** In order to prevent personal accidents caused by sudden starting, please turn off the power before operating.



1. Loosen the adjusting screw ③, move the movable knife in the direction of the arrow, and adjust the distance from the front end of the needle plate to the front end of the small thread trimming lever ① to 18.5mm.
2. Loosen the fixing screw ⑤, move the fixing knife, and adjust the gap between the pinhole wire guide ② and the fixing knife ④ to 0.5mm.

### 1.7 The amount of oil in the hook



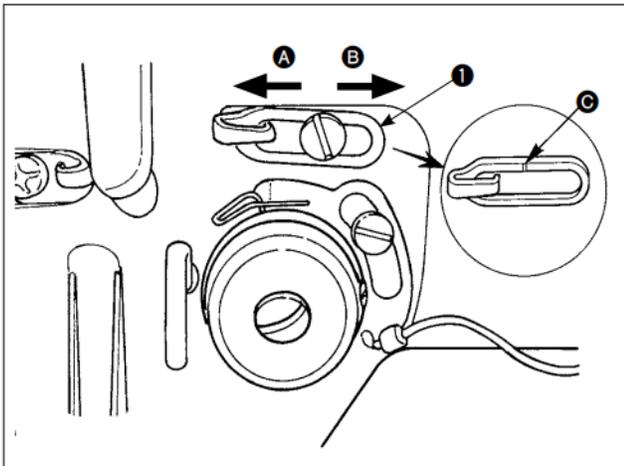
1. Loosen fixing screw ❶ and remove fixing screw ❶.
2. After tightening the adjusting screw ❷, the oil volume on the left side of the filler pipe ❹ will be reduced.
3. After adjustment, tighten the fixing screw ❶ to secure it.

**Note!**

1. Standard shipping condition: Gently tighten ❸ and turn 4 turns.
2. When adjusting the oil volume, do not tighten it all at once. Tighten ❸ and turn it 2 turns.

Take a look in about half a day. If you tighten it too much, it will wear out the hook.

### 1.8 Adjustment of the thread take-up amount of the thread take-up lever



1. Move thread guide ❶ to the left direction A to increase the thread take-up amount.
2. Move thread guide ❶ to the right in direction B to reduce the amount of thread take-up.
3. The standard position of wire guide ❶ is when line C is aligned with the center.

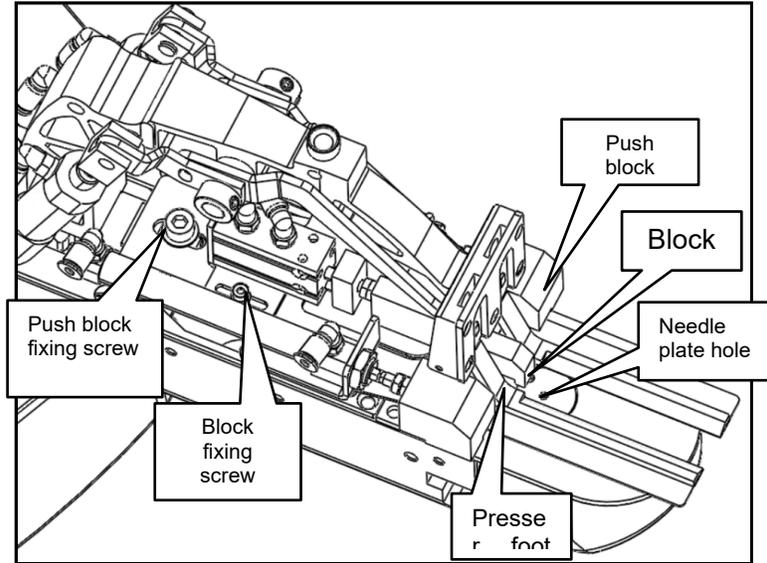
**Note!**

Move the engraved line C of wire guide ❶ from the center to the end of the screw. Afterwards, a disconnection failure may occur.

## 2. Adjustment of blocking and pushing positions (The head electronic control is in the pattern selection interface)

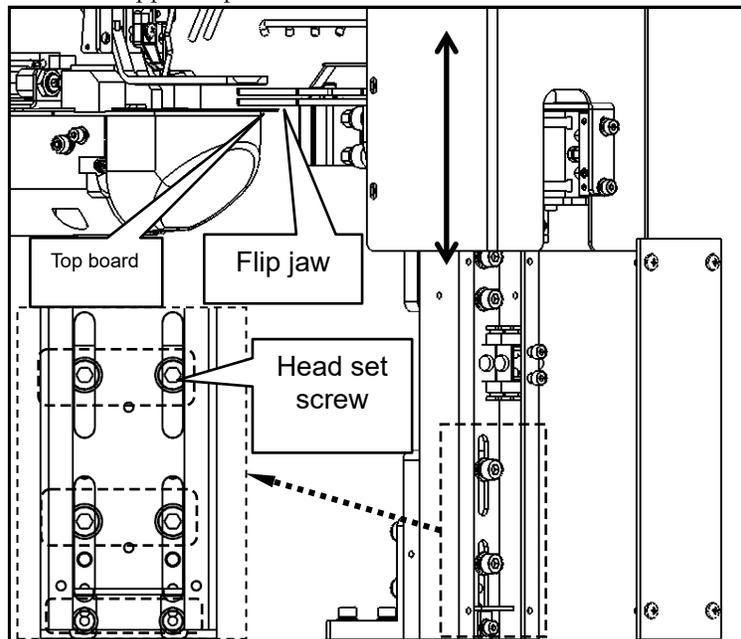
1. Loosen the fixing screw of the block and adjust the position of the block based on the push block. The block should be 5mm in front of the push block.

2. In the sewing standby state, loosen the fixing screw of the pushing block and adjust it based on the front end of the blocking block so that it is 6mm away from the needle plate hole.



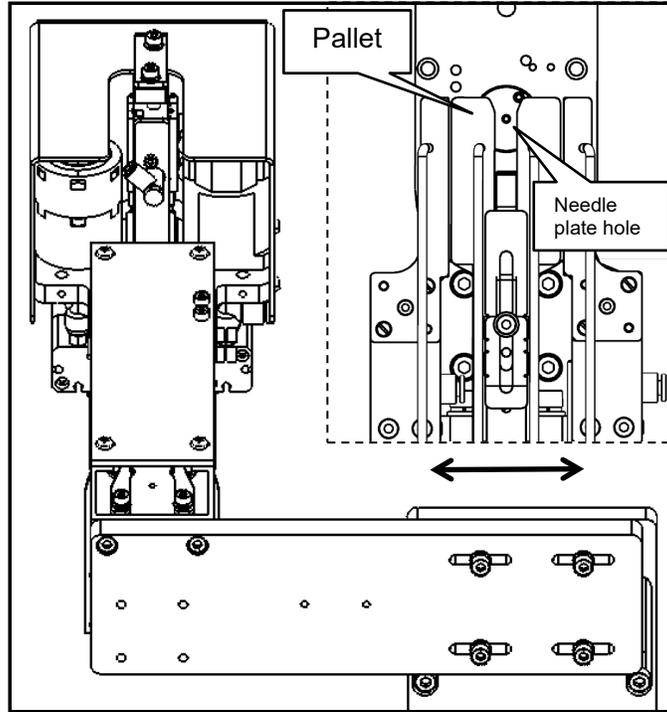
## 3. Flip clamp and sewing table height adjustment (Perform with the power and gas turned off)

1. Loosen the head fixing screw and adjust the height of the head so that the flipping jaw is 3mm higher than the support plate.



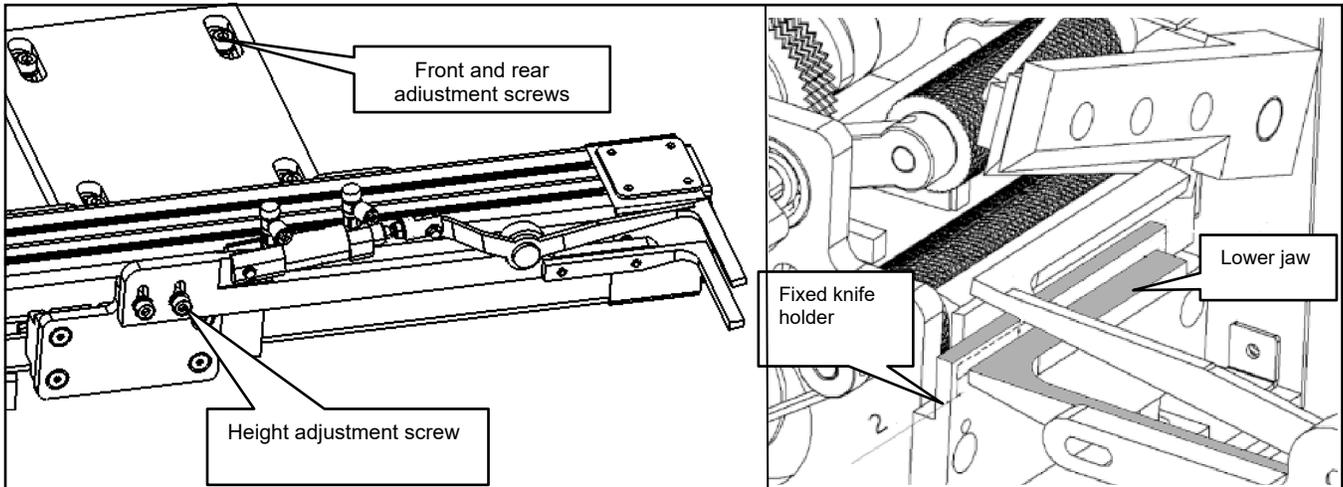
#### 4. Adjustment of the position of flipping jaw and needle plate hole (Perform with the power and gas turned off)

Loosen the adjusting screw and adjust the head left and right so that the needle plate hole is in the middle of the notch of the supporting plate.



#### 5. Adjustment of the height of the puller clamp (carry out with the power and gas turned off)

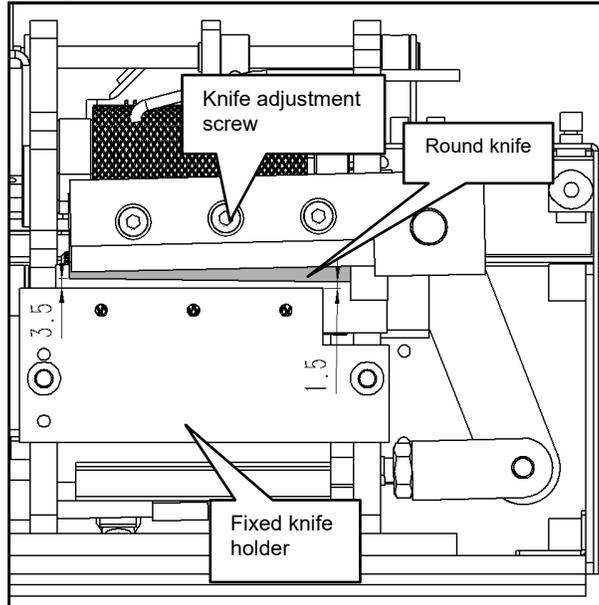
1. Loosen the front and rear adjustment screws, and adjust the puller jaw group so that the distance between the side of the lower jaw and the side of the fixed tool base is 2mm.
2. Loosen the height adjustment screw and adjust the puller clamp set so that the upper end of the lower clamp is flush with the upper end of the fixed tool base.



## 6. Adjustment of the cutter unit (conducted with the power and gas turned off)

### 6.1 Adjustment of the moving knife (the cutting unit is at the lowest point)

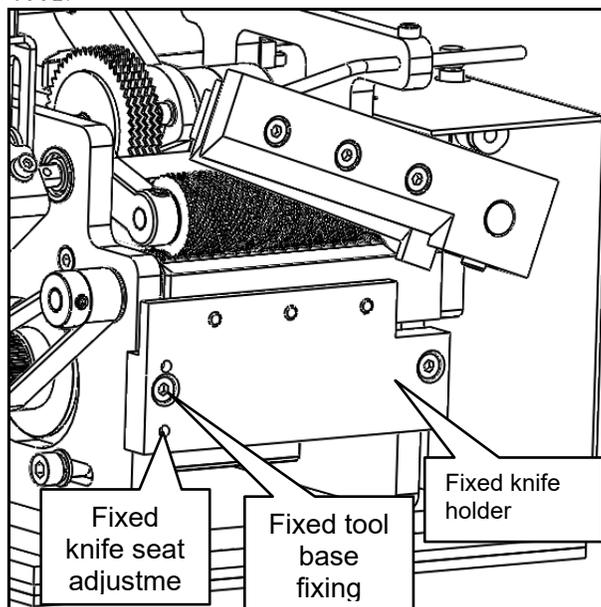
Loosen the adjusting screw of the movable knife, and adjust the position of the movable knife so that the tip of the left end of the movable knife is 3.5mm from the fixed knife base, and the tip of the right end of the movable knife is 1.5mm from the fixed knife base.



### 6.2 Fixed knife base adjustment

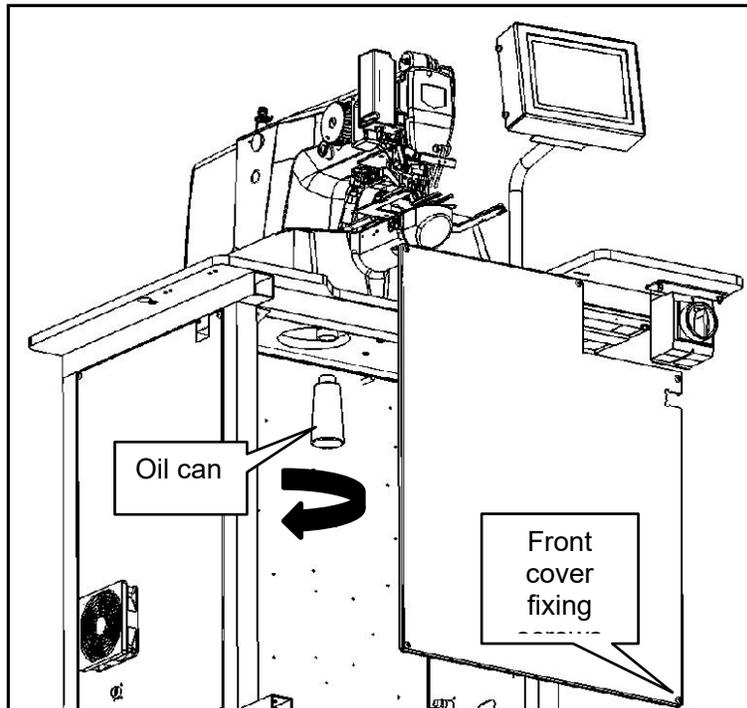
Use the fixing screw and adjusting screw of the fixed knife base to adjust the direction of the fixed knife base to match the cutter for cutting materials. It is required to drive the material by hand and cut the material neatly without hanging wires.

Note: The fit between the moving and fixed knives is not easy to be too tight. Too tight will easily damage the tool.



## 7. Waste oil treatment

After the oil tank is full of oil, please remove the oil tank cup to drain the waste oil.

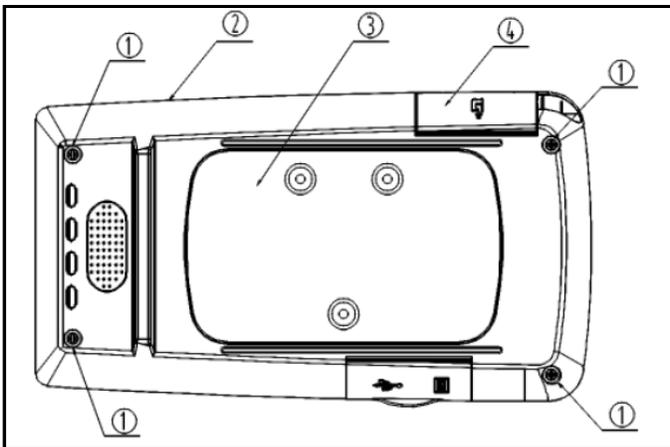


## 8. Battery disposal

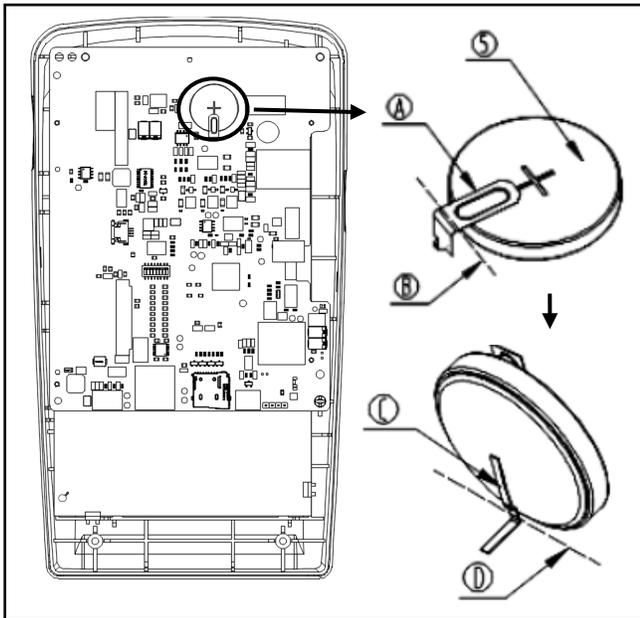
### 8.1 The battery on the electronic control panel of the machine head is discarded

The operation panel has a built-in battery because the clock operates even when the power is turned off. Regarding the disposal of batteries, please follow the laws and regulations of each country correctly.

#### How to remove the battery

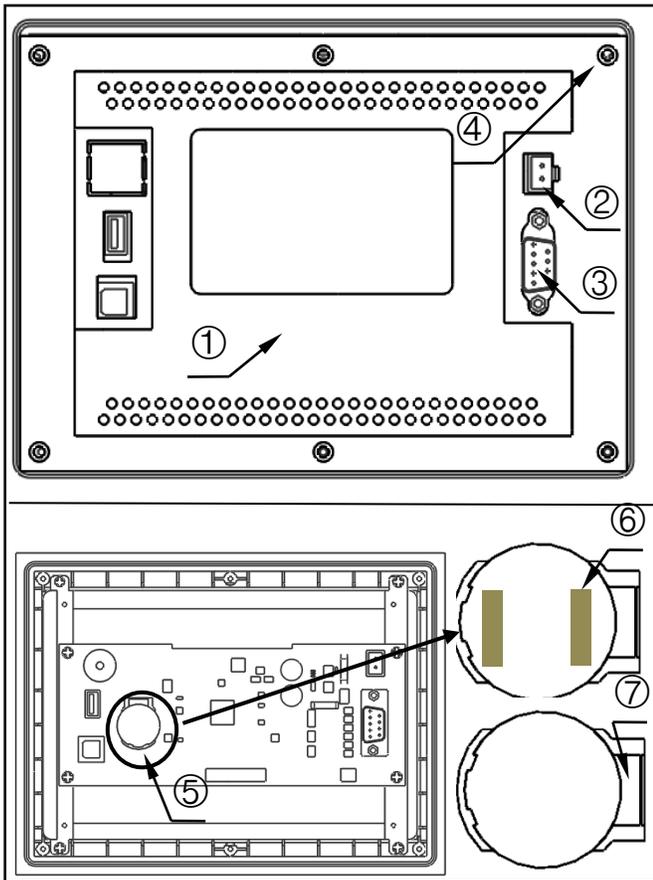


1. Remove panel ② from the host;
2. Open the power cable cover ④ and remove the power cable;
3. Remove the screws ① on the back of the panel and remove the rear panel casing ③;



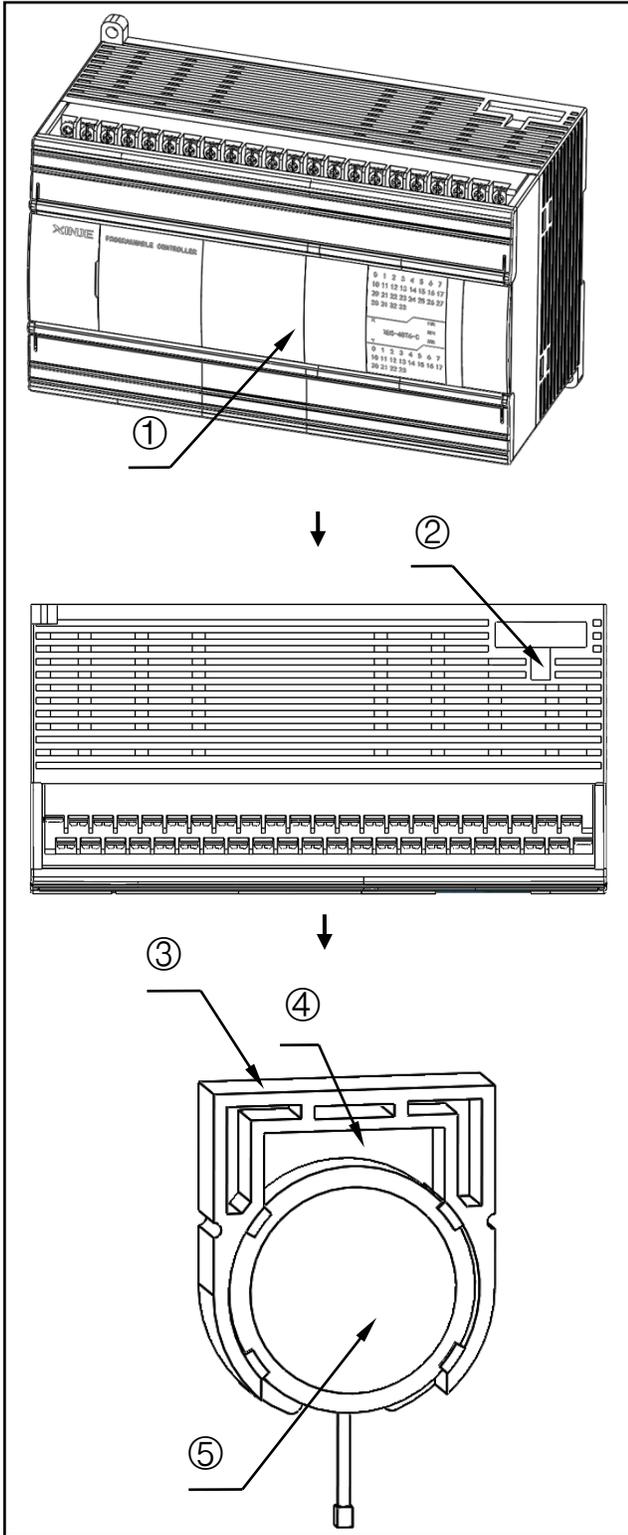
4. ⑤ is the battery used for the clock, model number is: CR2032TH05-13
5. Using diagonal pliers, etc., cut the metal plate holding the battery ⑤ at position B. A Make the cut and flip the battery along the cutting position ⑤.
6. Use diagonal pliers, etc., to cut the metal plate C holding the battery ⑤ at position D, and remove the battery ⑤.

### 8.2 PLC operation screen battery discarded



1. Remove panel ① from the host;
2. Disconnect the power cable ② and communication cable ③;
3. Remove the screws ④ on the back of the panel (6 in total);
4. ⑤ is the battery used for the clock, model: CR2032;
5. Use a blade to remove the glue fixed on the battery surface;
6. Use a flat-blade screwdriver, plastic film (head size 3mm\*4mm), etc., insert the flat-blade screwdriver at position ⑦, lift up the battery and remove it.;

### 8.3 PLC controller battery discarded



1. Remove the PLC controller ① from the fixed guide rail;

2. Use a flat-blade screwdriver and plastic film (head size 3mm\*4mm) to insert into position ② and pry out the battery holder ③;

3. Use a flat-blade screwdriver and plastic film (head size 3mm\*4mm), insert it at position ④, lift up the battery and remove it;

4. ⑤ is the battery used for the clock, model: CR2450;

5. Use a blade to remove the plastic film on the battery surface ⑤;