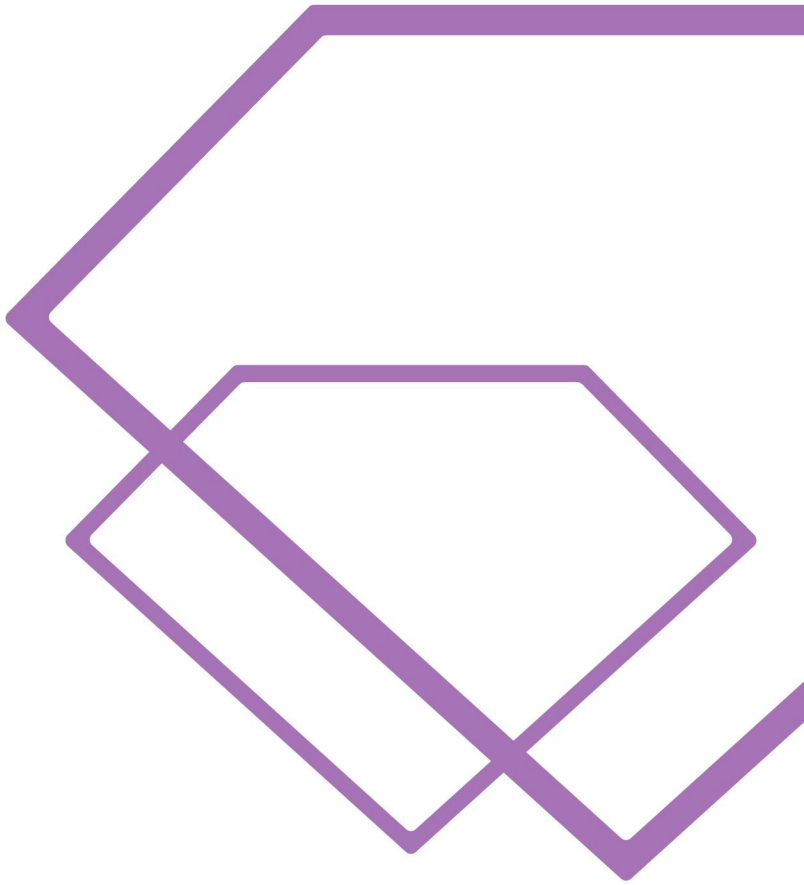
新一代智能缝纫机
THE NEW GENERATION OF INTELLIGENT SEWING MACHINE

HIKARI® 富山

使用说明书
INSTRUCTION MANUAL



HAT-K5A 系列 Serles

自动接橡筋机
AUTO ELASTIC JOINING MACHINE

V1.00

Shanghai HIKARI Precision Machinery Technology Co., Ltd.

Instruction manual

Products: HAT-K5A[auto elastic joining machine]
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History of revision				
Version	Revision No.	Descriptions	Date	Author
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Auto elastic joining machine

instruction manual

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Table of contents

Auto elastic joining machine

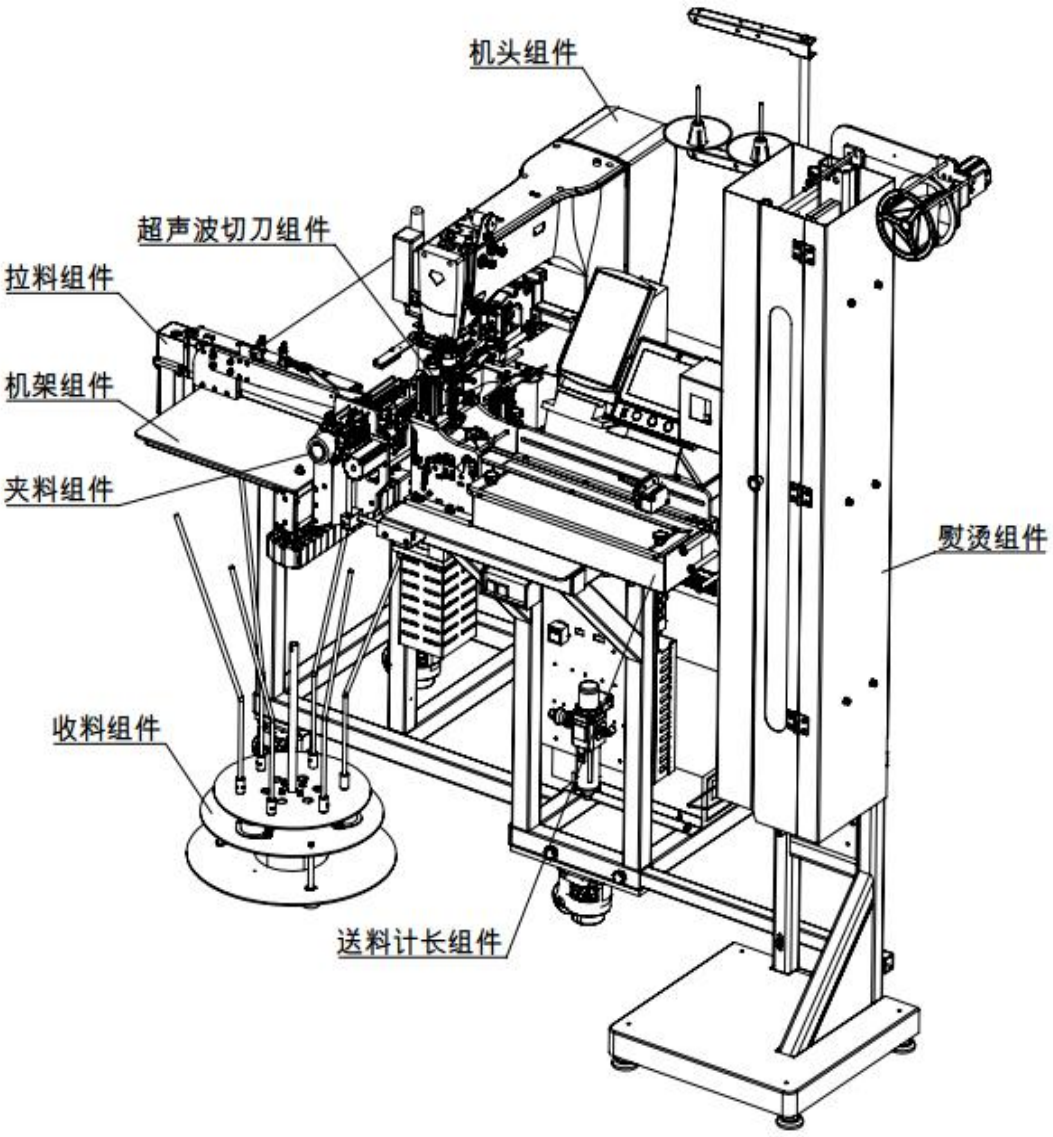
⚠ *Before using this product, Please read the followings carefully before use。*

Property indexes

Property indexes of the auto elastic joining machine			
	Item	Range	Specifications
Process indexes	Type of elastic band	With or without mark	
	Stitch lines	oversewsuperimposed seam	
	Type of stitch lines	single needle flat-seaming	
	Maximum width of elastic ribbon	80mm	HAT-K5A-C50YSL 8-50mm standard HAT-K5A-C80YSL 50-80mm standard
	Minimum width of elastic ribbon	6mm	
	Minimum length of elastic ribbon	180mm	
	Ironing function	automatic On/Off	
	Material receiving function	automatic On/Off	
	Operating mode	No Logo Single-stage Multi-Stage Multi- Logo	
	cutting-up mode	Ultrasound-edgecold-edge	Optional
	Marker	automatic On/Off	Optional
	Top sewing speed	2800(needle/min)	
System parameters	Range of gauge distance	0.3 ~ 12.7 (mm)	
	Resolution of gauge distance	0.1(mm)	
	Panel upgrading mode	USB flash disk	
	Touch screen	7 inch touch color screen	
	Detection types of broken stitches	digital encoder	
	Supply voltage range	220V/50HZ± 10%	
	Rated power	0.5KW	
	Operating temperature	0℃~45℃	
	Operating humidity	35% ~ 95%(no condensation)	
	Rated air pressure	Equal to or greater than0.5MPa	
	Gas consumption	60(L/MIN)	
	Pneumatic components	AIRTAC	
	Working air pressure	86kPa~106kPa	

Parts Info

Parts Info

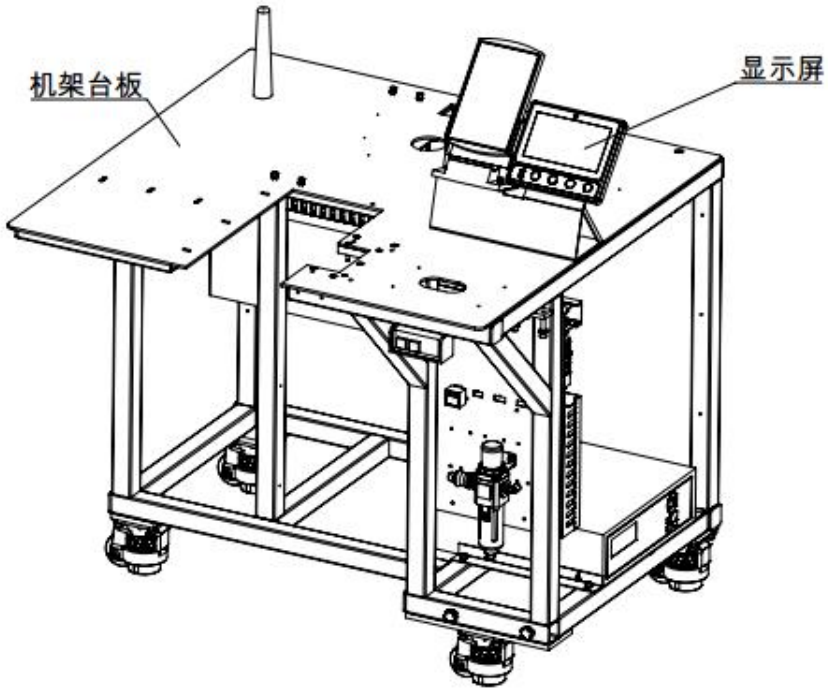


机头组件 超声波切刀组件	head units ultrasonic cutter units materialstripping units

拉料组件 机架组件 夹料组件 熨烫组件 收料组件 送料计长组件	machine frame units material holding units ironing units material receiving units feeding length measuring units

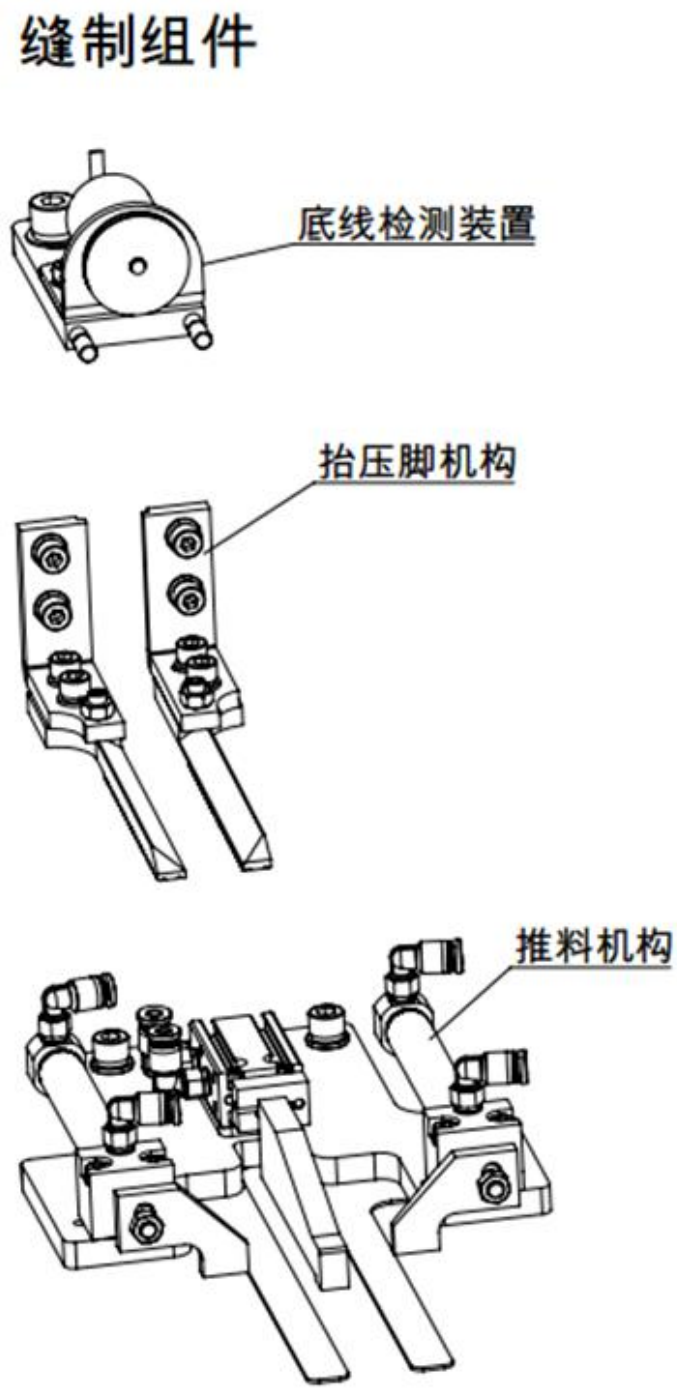
Components of machine frame

Components of machine frame



机架台板 显示屏	machine frame table display screen

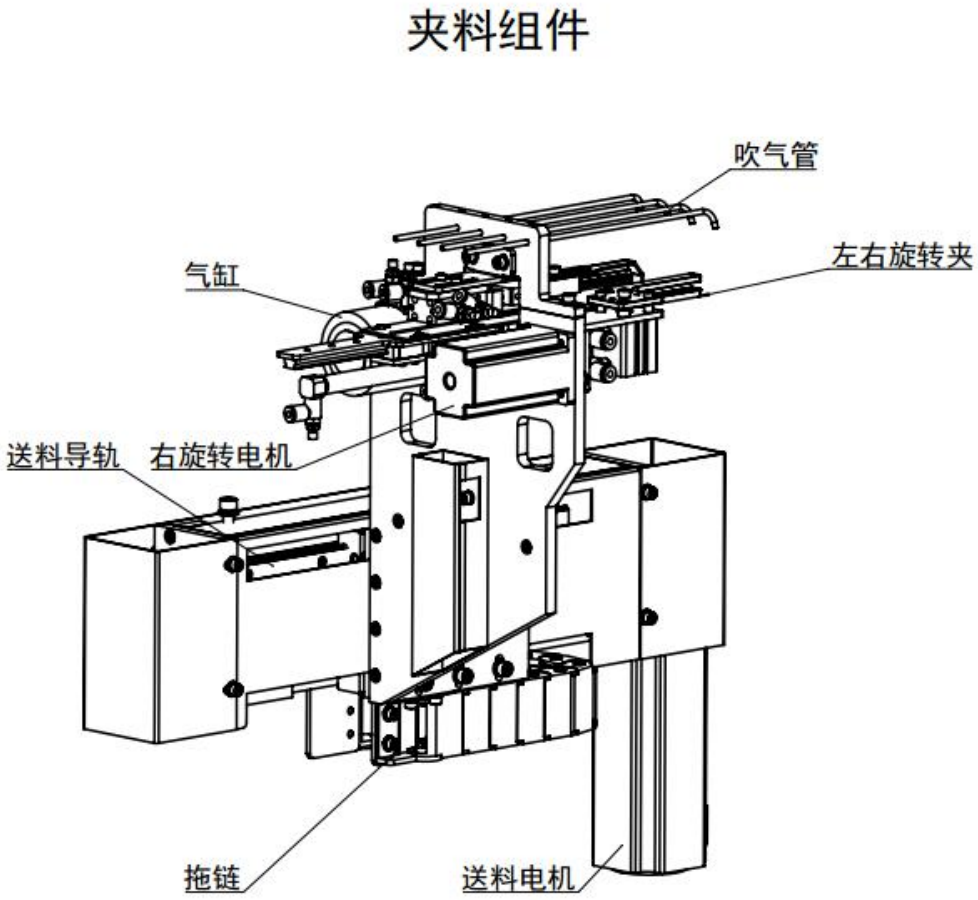
Sewing units



底线检测装置	foundation yarn detection device

抬压脚机构 推料机构	presser foot unit pushing unit

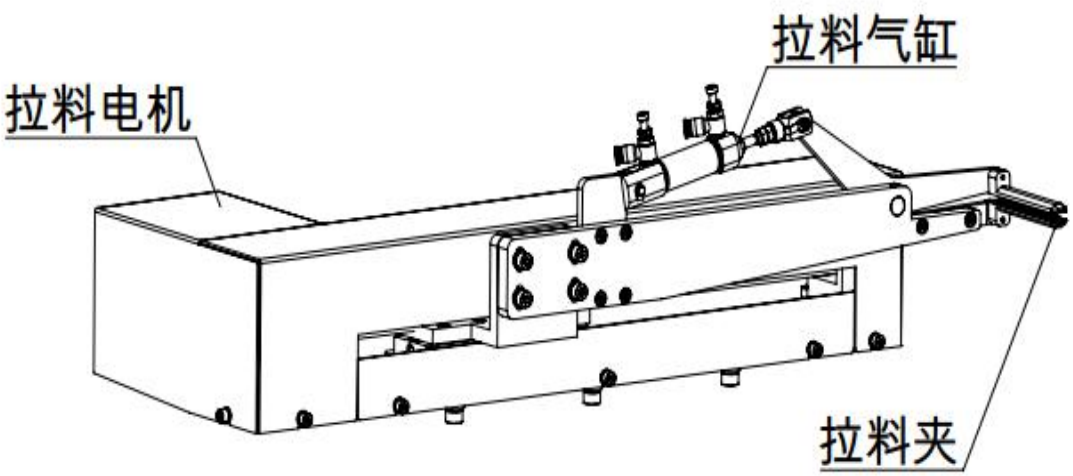
Material holding units



吹气管 左右旋转夹	blowpipe left and right rotating clamps cylinder feed rail

气缸 送料导轨 右旋转电机 拖链 送料电机	right rotating motor drag links feeding motor

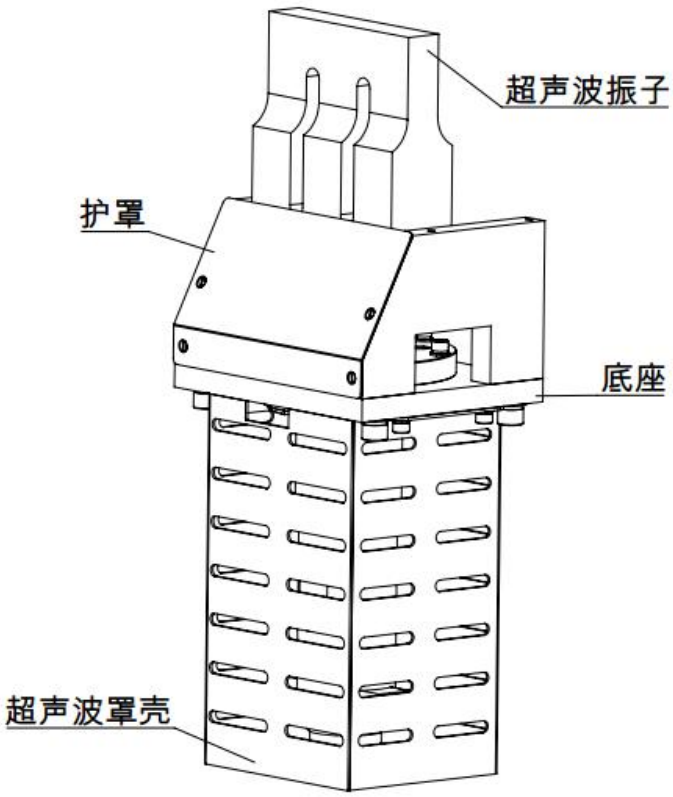
Material stripping units



拉料电机 拉料气缸 拉料夹	stripping motor stripping cylinder stripping clamp

Ultrasonic cutter units

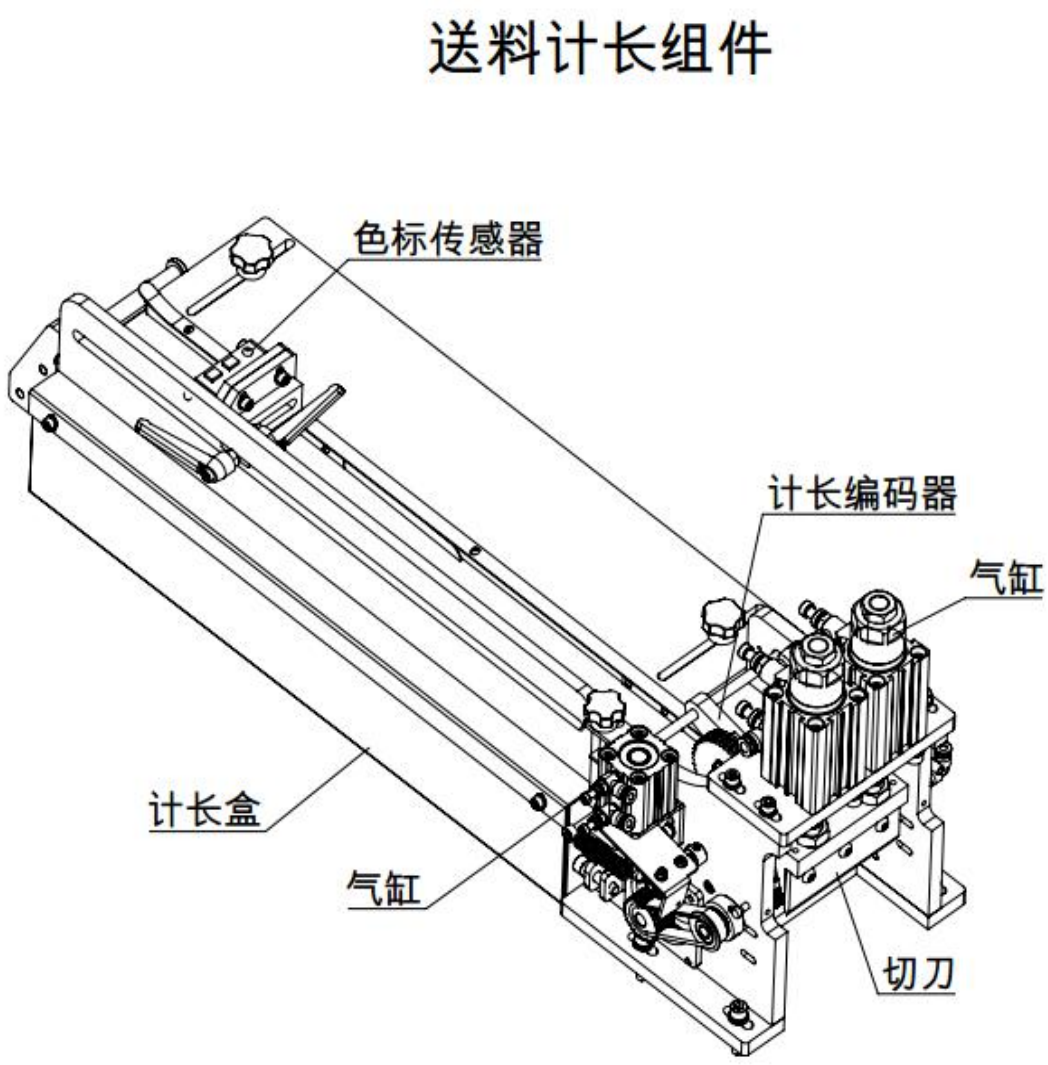
Ultrasonic cutter units



超声波振子	ultrasonic vibrator
护罩	shield
底座	base

超声波罩壳	ultrasonic casing

Feeding length measuring units

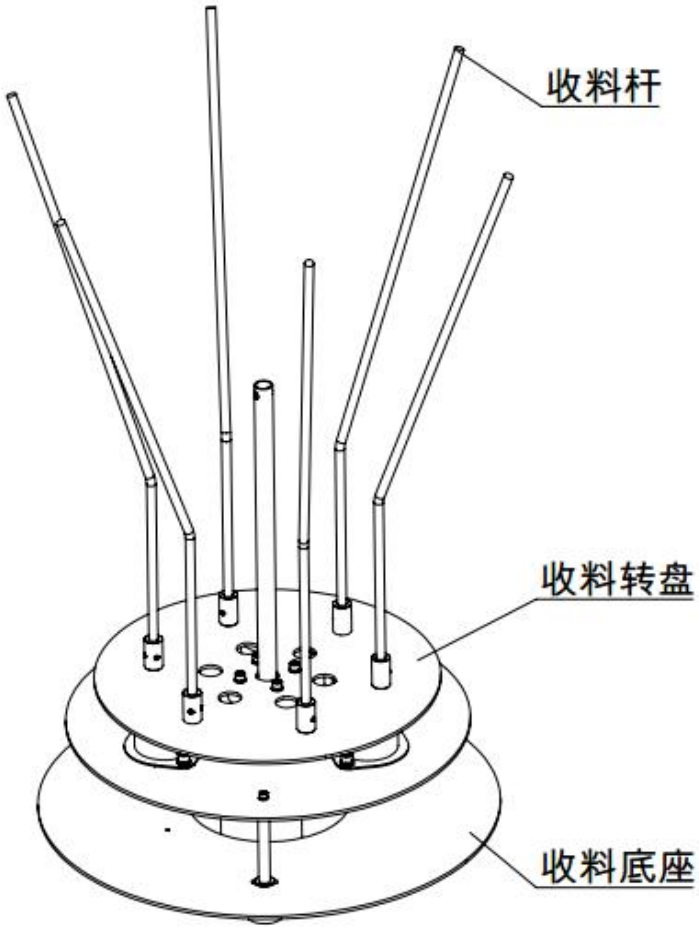


送料计长组件 色标传感器 计长编码器	feeding length measuring units color code sensor length encoder cylinder

气缸 计长盒 切刀	length counter cutter

Material receiving units

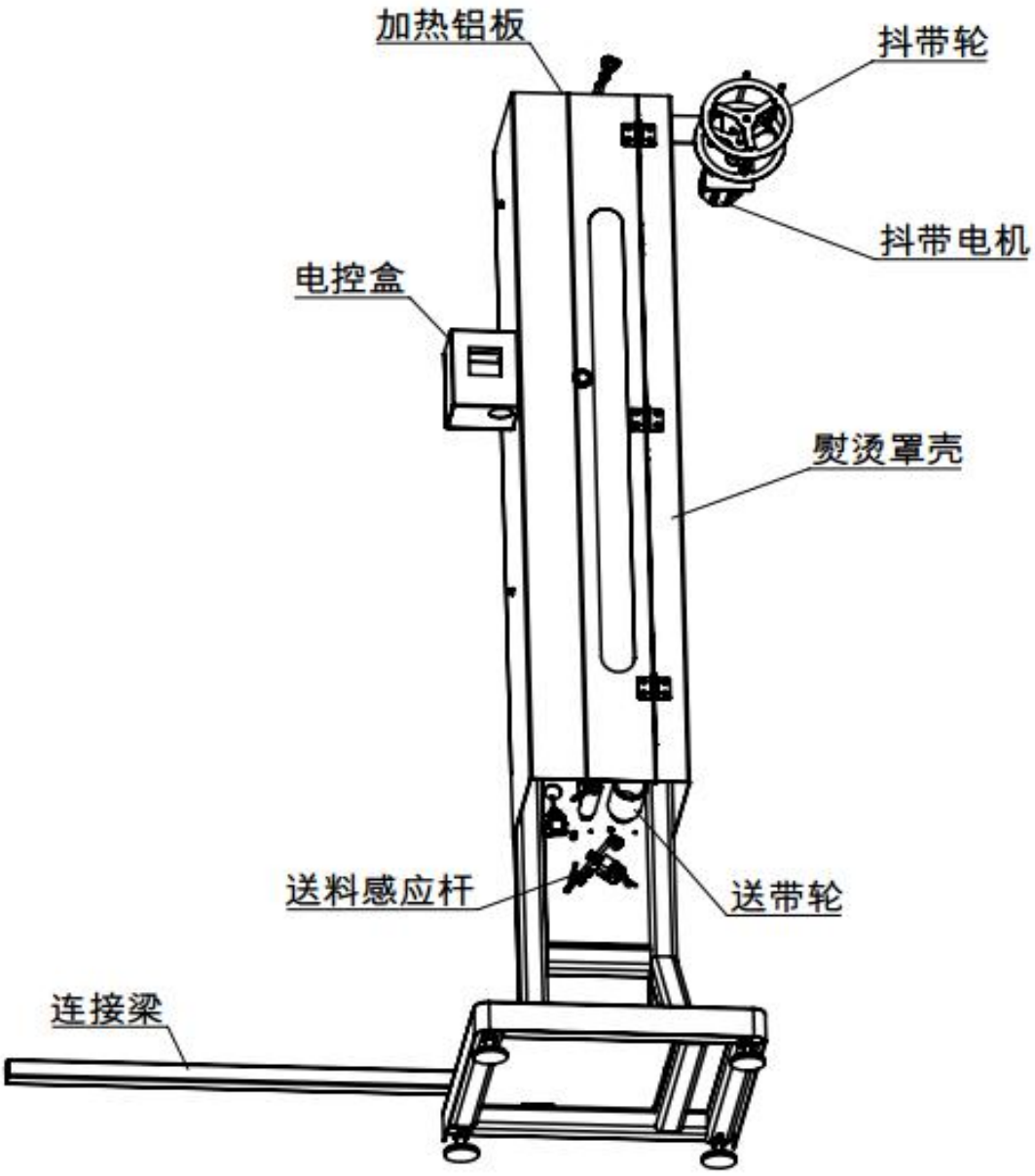
收料组件



收料杆 收料转盘 收料底盘	receiving rod receiving rotor disc receiving chassis

Ironing units

Ironing units

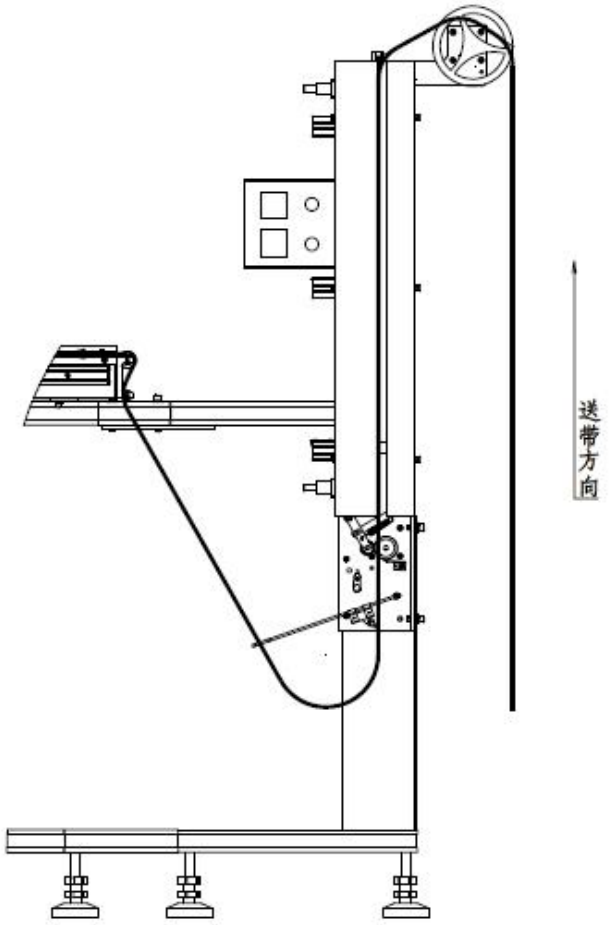


加热铝板 抖带轮	heating aluminum plate shake wheel shaking motor electric control box

抖带电机 电控盒 熨烫罩壳 送料感应杆 送带轮 连接梁	ironing cover feeding sensor rod conveyer wheel connecting beam

Pull-through diagram

穿带示意图



送带方向 conveying direction

Interface description

Work interface of the machine

1: After powering on the machine, you may see the **main interface** of the machine as shown below:

2: Click the upper left corner of the main interface to display the language selection interface as shown below:

1: Procedures: **start the machine**;

2:Sewing mode:

① Sewing for a single cycle  : the machine stops automatically after sewing one piece;

②Cyclic sewing  : after the first boot, the machine will continue sewing;

2: Single operation:

Elevation of pinch roller: to adjust the pinch roller up and down

Movement of knife: to control the movement of the knife

3: Real-time display of the number of workpieces:

①**The number of workpieces to be processed**: (click Reset to reset the number);

②**Length of elastic ribbon** : (length of elastic ribbon being processed);

③**Preset output, preset number of workpieces**: when the preset number of workpieces reaches the preset output, the machine stops working;

④ **Length compensation: (adjust the length of elastic ribbon);**

⑤ Left length, right length: (adjust the left and right lengths of the elastic ribbon being processed);

4:Working mode:

① **No Logo**， ② **single-stage**， ③ **single-mark and multi-Stage**，④**Multi- Logo**，⑤**Multi- Logo and multi-Stage**

5: Settings of rotor disc: set the bundling and inching parameters of the rotor disc;

6: **Action debugging**: Enter the **single-action debugging** interface to test the single action of the machine:

7: Monitoring interface: operation: **input detection, output control**

Working mode selection interface

3: **Modify the working mode**: click 无标志 to enter the following interface

Working mode selection:

1**No Logo**: there is no need for special parameter settings, andthis mode applies toNo Logo elastic band.

2 **Single-stage**: style: LOGO

3 **Single-mark multi-stage**:

LOGO

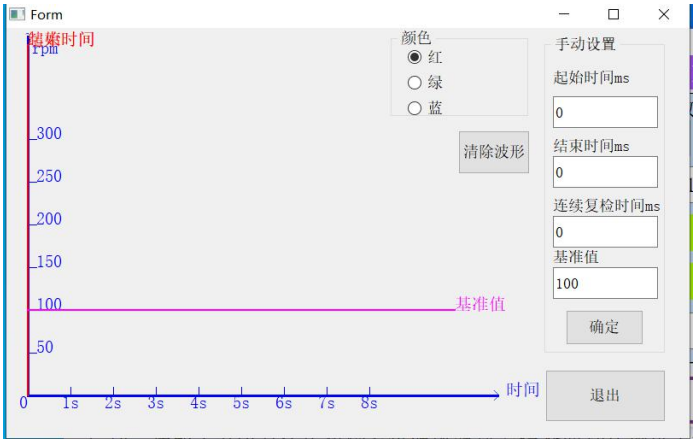
style: LOGO

4 **Multi- Logo**: style: GO LOGO LOGO LOGO LOGO LOGO LO

5 **Multi- Logo and multi-stage**:

For specific parameter settings, please refer to the descriptions about mode setting!

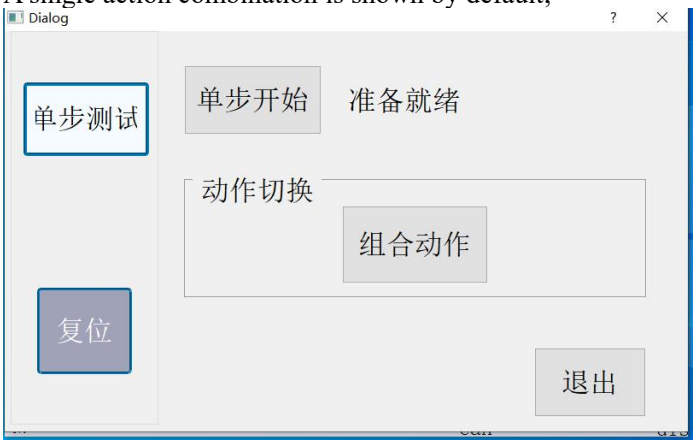
Click on the lower right corner of the main interface to enter the foundation yarn detection setting interface as shown below.



Single-step debugging interface

4. Click  **to enter the single-step debugging interface:**

A single action combination is shown by default;



Click  to switch to a single-step action, namely components of the action:

Start time: Set the time to detect the foundation yarn after the sewing operation starts (1000ms by default).
End time: Set the time to finish the detection of the foundation yarn after the sewing operation starts. The sewing time required varies from widths of elastic bands. The wider the band is, the longer it will take to complete the sewing(1600ms by default).
Continuous recheck time: The longer the time is, the lower the detection sensitivity will be (100 by default)
Baseline value:set the bottom threshold for detection.

1: Single-step check:

It aims at debugging a single action of the mechanism; the user can make a switch between a single-step action and the action combination;

If the action goes wrong or should be canceled, directly click **reset** to reset the machine;

Exit this interface, and the system will automatically reset once;

Setting interface of machine parameters

5. Click  to enter the parameter setting interface:

2: Units

Parameter setting interface:

According to the different functions of the machine, the following designations are provided. When debugging or using, click the button corresponding to the designation according to the machine action; then, enter and adjust the specific parameter value;

1 Length measuring unit (as shown on the left)

1.1 Adjust the cutting-up effect. The larger the value is, the longer the time that the ultrasonic unit will work will be.

1.2 The running speed of the length measuring motor when feeding.

1.3 The speed at which the logo is detected when the length measuring motor is working.

1.4 The ratio of speed betweenthe pulling motor and the length measuring motor in the synchronous working context

1.5 Blowing time when the cutter moves.

1.6 Delay time for blowing after the presser foot of the machine head is pressed down.

1.7 Delay time for action of cutter cylinder

2 Units (as shown on the left)
2.1 Adjust the ironing time
2.2 Ironing switch
2.3 Adjust the cutting-up mode (Ultrasound-edge, cold-edge)
2.4 Motor selection. (motor A, motor B) (when motor A is not selected, choose motor B by default)
2.5 frequency of ribbon cutting.
2.6 Ironing motor selection. (Asynchronous, stepping) (The ironing motor is a stepping motor for machine K5 , and is an asynchronous motor for model A and C)
2.7 Streamlined mode. (Streamlinedmode by default) (there is no sewing operation in the streamlined mode, but the cutting operation. Normally, the machine works in a streamlined mode by default.)
2.8 Adjust the proportional coefficient of ironing-feeding length. the larger the coefficient is, the greater the length will be.
2.9 Feeding length detection threshold: the smaller the value is, the higher the detection sensitivity will be
2.10 Adjust the alarm time
2.11 Running detection mode. (running mode by default)
Default mode: the machine works normally;
Running mode: conduct running testbefore the machine leaves the factory

3: Pushing unit

3: Pushing unit

3.1 Adjust the tilt angle of the right rotating motor so that the elastic band runs smoothly.

3.2 Speed of right rotating motor.
3.3 After the pushing unit receives the elastic band, push it forward in advance and wait for the last stitching.
3.4 Adjust the push-in position to find the best position for stitching.
3.5 The speed of the pushing motor during working.
3.6 Afterthe machine head completes material sewing, the pushing unit delays the push-in time.

4 Material receiving unit

4.1 The number of materials received by each receiving rod at a time
4.2 Adjust the time of the pushing cylinder of the head
4.3 Adjust the time of the presser foot cylinder of the head

4 Material receiving unit

5 Stripping unit

6: Detection switch:

5 Stripping unit

5.1 The speed of the stripping motor during moving right.
5.2 The distance that the stripping unit moves right to find the best position for stripping the materials
5.3 Setting of the pull-back distance of the stripping motor.
5.4 Setting of joint pull-back distance.

6: Detection switch:

Adjust foundation yard detection sensitivity; the lower the value is, the lower the sensitivity will be(The settings depend on the feedback value)

1.Foundation yard detection sensitivity: Adjust the foundation yard detection sensitivity; the larger the value is, the higher the sensitivity will be

2. Foundation yard detection switch: to check whether the system gives an alarm when the foundation yard reaches the target value

3. Air pressure detection switch: to check whether the system gives an alarm when the air pressure is lower than the set value

4. Elastic ribbon connector detection switch: to check whether the system gives an alarm when the elastic ribbon connector is detected

5. Elastic ribbon detection switch: to check whether the system gives an alarm when there is no elastic band detected

6. Positioning switch: whether to use a marker

7. Metal detection switch: to check whether the system gives an alarm when themetal exists in the elastic band

8. Receiving detection switch: to check whether the system gives an alarm when the elastic band is not removed afterthe machine head completes the sewing.

Note: When the functional switch is On, the machine will give an alarm and stop workingif the above problems occur. When the functional switch is Off, the machine will give no alarms and continue working, even if either of the above problem occurs.

Fault alarming and solution interface

3 Fault alarming:

When a fault occurs, the machine will stop working and give an alarm: (click **OK**to release the alarm)

Alarm content and solution:

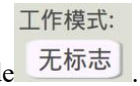
Alarm No.	**Alarm Name**	**Solution**
1	No alarm about elastic ribbon	Please check the elastic band and put it in place
2	Connector alarm	Please check the elastic band and remove the connector
3	Congestion alarm	Please check the elastic band and put it in place
5	Air pressure alarm	When the air pressure is lower than the set value, please check the ventilation device
6	Alarm for insufficient mark length	Please check the actual length of the marked elastic band
7	No mark alarm detected	Please check the operating mode and elastic band
8	Broken stitch alarm	Please check whether the upper and lower threads are broken or not.
9	Insufficient lower thread alarm	Please replace the lower thread before releasing the alarm
10	Abnormal reset of the head	Please check if the head reset device works normally
11	Emergency stop	Please check whether each device works normally

12	The head fails to be reset	Please reset the head
13	Reach the sewing number	The sewing number reaches the preset value
14	5 Stripping unit	The origin of the stripping unit is detected as abnormal
15	3: The origin of the pushing unit is detected as abnormal	Please check whether the origin sensor of the pulling unit works abnormally
16	Alarm for length measuring driver	Please check the length measuring driver
17	Alarm for pushing driver	Please check the pushing driver
18	Alarm for stripping driver	Please check the stripping driver
19	Alarm for right rotating driver	Please check the right rotating driver
20	Ironing feed alarm	Please check the ironing feeder and restore the elastic band to the normal state
21	Receiving detection alarm	Please check whether there is residual material on the machine head, and remove it manually
22	Feed length deviation alarm	Please check whether there is any deviation in size and length. If yes: 1. Please check the feed device 2. If there is no problem with the feed device, please set the length compensation If no: please adjust the feed length detection threshold
23	No cylinder sensordetected	Please check if the cylinder sensor is installed improperly If yes: please adjust the sensor position If no: please check whether the sensor is damaged and whether the wires are well connected
24	Deviation alarm of pushing motor reference position	Please reset the unit
25	Deviation alarm of stripping motor reference position	Please reset the unit
26	Deviation alarm of right rotating motor reference position	Please reset the unit
27	Right rotating motor origin error	Check if the right rotating motor runs when it is reset, 1. If no, check the driver, motor and corresponding connecting lines; 2. If yes, power off the motor and remove the phase lines before powering it on; go to the detection interface, and rotate the motor shaft to observe whether there is any change to X25 right rotating origin signal. If no signal change occurs, check whether the X25 connecting lines are connected correctly and whether the motor encoder is damaged.
73	Abnormal communication alarm of X1 axis driver	Please contact the manufacturer
74	Abnormal communication alarm of X2 axis driver	Please contact the manufacturer
75	Abnormal communication alarm of X3 axis driver	Please contact the manufacturer
76	Abnormal communication alarm of X4 axis driver	Please contact the manufacturer

Mode setting and operation instructions

1No Logo mode

Basic procedures:

1. Select the**No Logo** mode 

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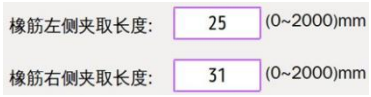
2. Set the **length of elastic ribbon** 

, such as:300mm; enter 300 directly.

3. Set **the clamping length on the left and right** 

, and select the seam line as needed.

4. Set the **preset output** value 

and **lower thread count** 

.

5. Load the elastic band into the length-measuring unit according to the pull-through diagram; click the **cutter action** button  to cut off the excess part.

6. Confirm that the units are put in place.

7. Select sewing mode: **sewing for a single cycle** 

.

8. Press the **start** button and the machine will automatically run.

9. After the sewing operation is completed and the machine stops working, check whether the actual length of the elastic band deviates from the preset one.

10. If there is any deviation, please make length compensation.

11. After the setting is completed, select the sewing mode: **cycle sewing** 

.

12. Click the **start** button, and the machine will automatically and cyclically work to complete the preset output.

2 LOGO mode

2.1. Method for calibrating color code sensor:

2.1.1. Set the light spot detection range of the color mark sensor as 10±1mm.

2.1.2. First align the light spot of the color code sensor to the LOGO, and press ON. After the indicator light flashes slowly, move the light spot and align it to the elastic band without LOGO. Then press OFF, and complete the calibration, after the indicator light flashes for about 2 seconds. For details, see Figure 1 below.

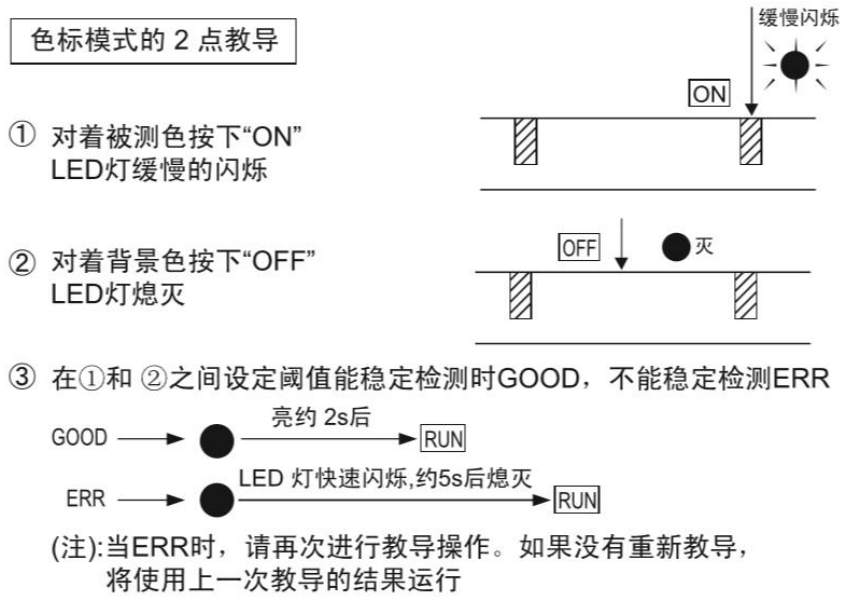


Figure 1 Color code sensor calibrating method

2.2, Single-stage:

Take the sample, and calculate the total length of the elastic ribbon, the length of the color code, the length of the LOGO, and the LOGO interval (see Figure 2 below); place the color code sensor in the place where the color code is located, and input and save the parameters in the operation interface. When the color code is not long enough to accommodate the color code sensor,input the proper advance detection distance. The error-proof detection distance is the distance designed to detect the presence of the LOGO before the end of sample feeding. If the LOGO is detected, an error will be reported and the machine stops working.

Note: This mode is suitable fortheelastic band with sparsely distributed logos, or large LOGO intervals.

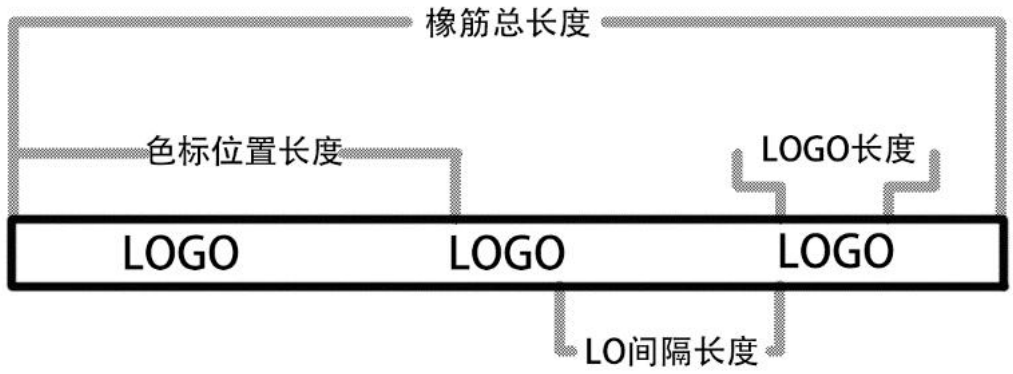


Figure 2

2.3. Single-Logo multi-stage:

Take two samples with different lengths, and calculate the total length of the elastic ribbons, the length of the LOGO, and the LOGO interval (see Figure 3 below); take the longer ribbon and calculate the length of color code; place the color code sensor in the place where the color code is located,calculate the length of two samples, and input and save the parameters in the operation interface （No additional parameter setting）. The error-proof detection distance is the distance designed to detect the presence of the LOGO before the end of sample feeding. If the LOGO is detected, an error will be reported and the machine stops working.

Note: This mode is suitable fortheelastic band with sparsely distributed logos, or large LOGO intervals.

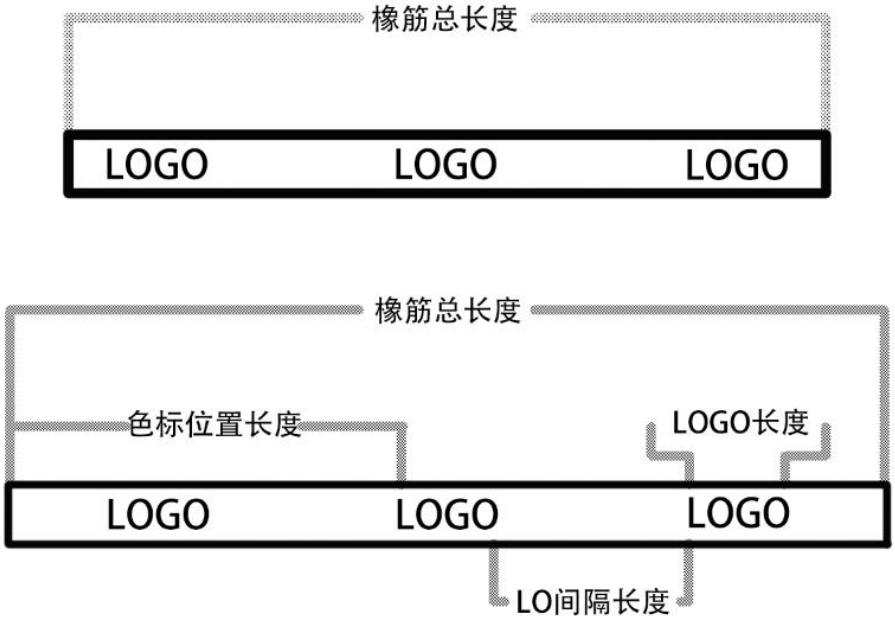


Figure 3

2.4 Multi-Logo:

Take the sample, and calculate the total length of the elastic ribbon, the length of the color code, the length of the LOGO, and the LOGO interval (see Figure 4 below); place the color code sensor in the place where the color code is located, and calculate the number of LOGOs before the LOGO where the color code sensor is located. Input and save the number of LOGOs in the operation interface.

Note: This mode is suitable forthe elastic band with densely distributed logos, or small LOGO intervals.

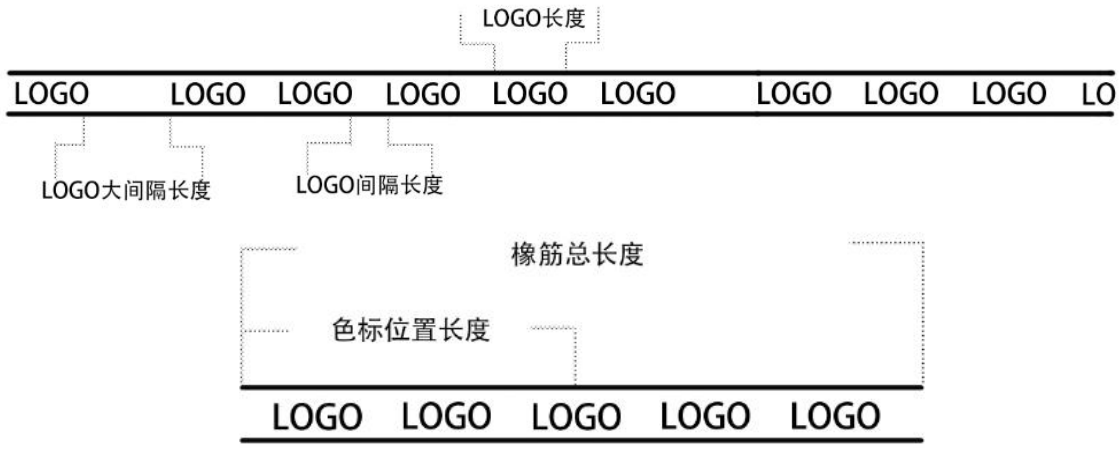
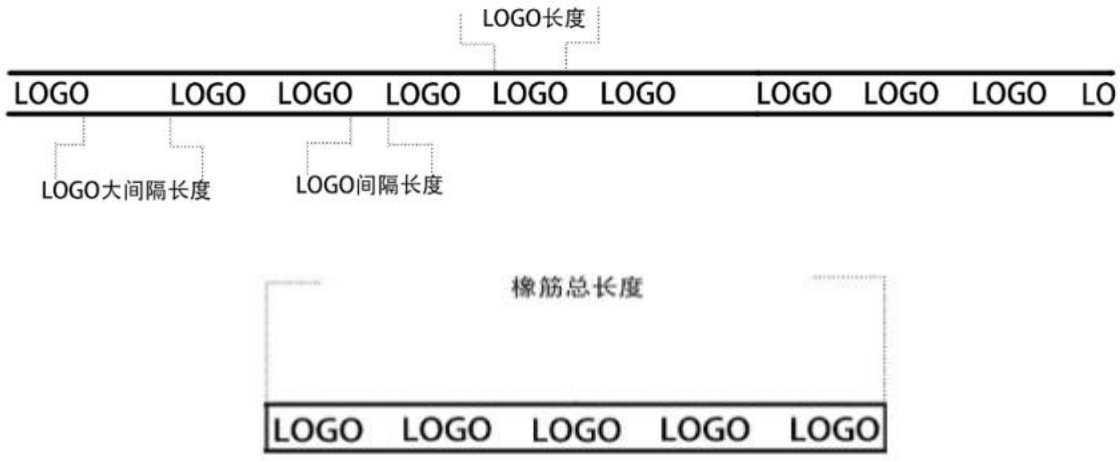


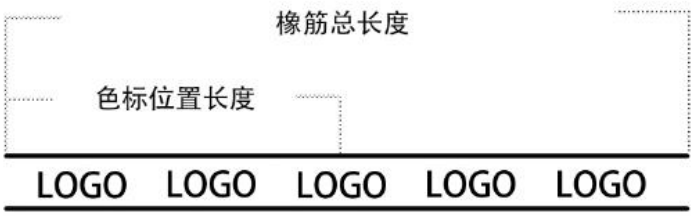
Figure 4

2.5 Multi-Logo and multi-stage:

Take two samples with different lengths, and calculate the total length of the elastic ribbons, the length of the LOGO,the LOGO interval and the maximum LOGO interval (see Figure 5 below); take the longer ribbon and calculate the length of color code; place the color code sensor in the place where the color code is located, and calculate the number of LOGOs before the LOGO where the color code sensor is located. Input the number of LOGOs; Measure the length of the finished elastic ribbons and enter the parameters in the operation interface. When the color code is not long enough to accommodate the color code sensor,input the proper advance detection distance. The error-proof detection distance is the distance designed to detect the presence of the LOGO before the end of sample feeding. If the LOGO is detected, an error will be reported and the machine stops working.

Note: This mode is suitable forthe elastic band with densely distributed logos, or small LOGO intervals.





Electronic control requirements and precautions for use

0. Main technical indicators

Supply voltage range: AC220V±10%
Supply frequency: 50Hz/60Hz

1. Safety precautions

1.1 Scope of use

This servo controller is specially designed for industrial sewing machines. If it is used for other purposes, always pay attention to the safety of users.

1.2 Working environment

1.2.1 The power voltage should fall withinthe electrical control voltage plus or minus 10%.
1.2.2 Please keep away from the high-frequency electromagnetic wave transmitter, etc., so as to avoid the error of the controller caused by the electromagnetic wave interference.
1.2.3 Temperature and humidity:

a. Please operate it in a place where the room temperature is above 0°C and below 45°C.
b. Do not use it in a place with direct sunlight or use outdoors.
c. Keep it away from a heater (electric heater).
d. Make sure that the relative humidity falls between 30% ~ 95%(without condensation).

1.2.4 Keep it away from flammable gas or explosives.

1.3Installation

1.3.1 Please install the controller strictly according to the user manual.

1.3.2 Please turn off the power and unplug the power cord before installation.

1.3.3 When the power cords are installed, please keep them at least 3cm away from the rotating parts.

1.3.4 In order to avoid noise interference or electric shock, please ground the sewing machine and control box.

1.3.5 Before turning on the power, make sure that the power voltage falls within the specified electrical control voltage plus or minus 15%.

1.4 Provisions for maintenance

1.4.1 Please turn off the power before maintenance.

1.4.2 When the machine head is lifted to change the needle or thread, please make sure that the power is turned off.

1.4.3 As the control box ishigh-voltage charged, it can be opened more than 5 minutes only after the power is turned off.

1.4.4 Repair or maintenance should be performed by trained technicians.

1.4.5 Maintenance or repair cannot be performed when the motor or control box is working.

1.4.6 All parts for the maintenance purpose must be provided or approved by the company before use.

1.5 Danger alert

This mark indicates the safety precautions that users should pay attention to when installing the machine. Faulty

operation caused by neglect of this mark may result in personal injury or machine damage.

1.6 Other safety codes

1.6.1. After turning on the power for the first time, please run the sewing machine at low speed and check whether the machine rotates in a correct direction.

1.6.2. When the sewing machine is working, please do not touch the movable parts such as the handwheel and the needle.

1.6.3. All movable parts must be isolated with the provided protective devices to avoid body contact. Do not stuff the devices with other items.

1.6.4. Please do not operate the machine without the motor shield and other safety devices.

1.6.5. Prevent the motor or control box from falling to the floor.

1.6.6. Preventthe control box or the motor from tea and other objects in the liquid form.

富山IoT　　微信公众号　　抖音官方号

上海富山精密机械科技有限公司

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