

ZB-373G 电控使用说明书

ZB-373G electric control box manual

安全事项

- 在使用本产品之前，请先阅读《产品说明书》及所搭配的缝纫机机械说明书。
- 本产品必须由接受过专业培训的人员来安装或操作。
- 请尽量远离电弧焊接设备，以免产生的电磁波干扰本控制器而发生误动作。
- 请不要在室温 45°以上或者 0°以下的场所使用。
- 请不要在湿度 30%以下或者 95%以上或者有露水和酸雾的场所使用。
- 安装控制箱及其他部件时，请先关闭电源并拔掉电源插头。
- 为防止干扰或漏电事故，请做好接地工程，电源线的接地线必须牢固的与大地有效连接。
- 所有维修用的零部件，须由本公司提供或认可，方可使用。
- 在进行任何保养维修动作前，必须关闭电源并拔掉电源插头。控制箱里有高压危险，必须关闭电源五分钟后方可打开控制箱。

- Safety Precautions
- Before using this product, please read the User's Guide and the manual of the machine attached with it.
- This product must be installed or operated by professionally trained personnel.
- Please keep away from the arc welding equipment to avoid the electromagnetic wave from interfering with the controller.
- Please do not use it at room temperature above 45° or below 0°.
- Please do not use it in places with humidity below 30% or above 95% or where there is dew and acid mist.
- When installing the control box and other parts, turn off the power and unplug the power plug.
- To prevent interference or electric leakage accidents, make a good grounding work. The grounding wire of the power cord must be firmly connected to the earth.
- All parts for maintenance must be supplied or approved by the Company before they can be used.
- The power must be turned off and the plug unplugged before any maintenance action is performed. There is a high-voltage danger in the control box. You must shut down the power for 5 minutes before opening the control box.

1 产品安装 Product Installation

1.1 产品规格 product specification

电源电压 Voltage	AC 220±20% V
电源频率 Supply frequency	50Hz/60Hz
最大输出功率 maximum output power	550W

1.2 接口插头的连接 The connection of interface plug

将脚踏板及机头的各连接插头安插到控制器后面对应的插座上，各插座名称如图 1-2-2 所示。连接好，请检查插头是否插牢。

Insert the connecting plugs of the foot pedal and the head of the machine into the corresponding socket at the back of the controller. Each socket names are shown in figure 1-2-2. Please check whether the plug is inserted.

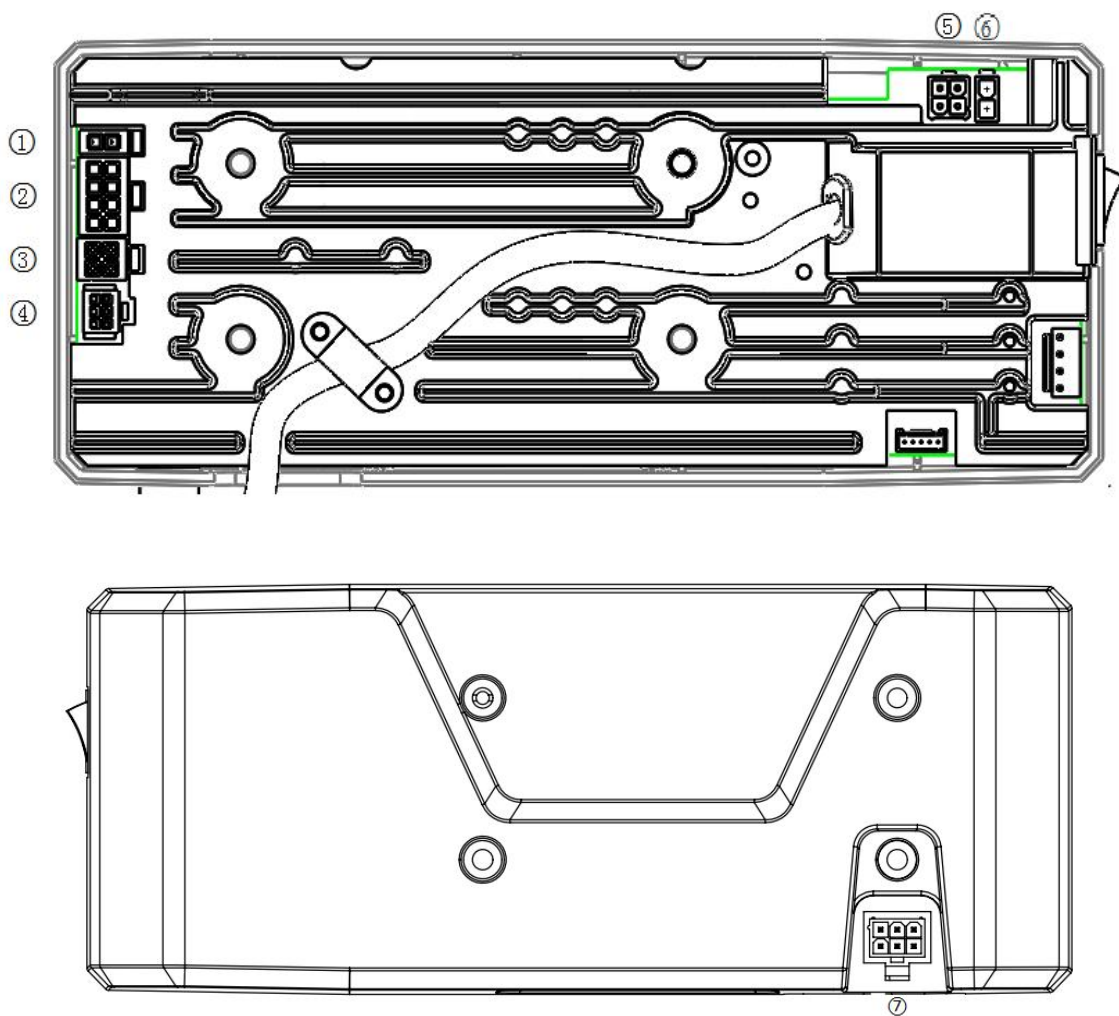


图 1-2-1 控制器图 (controller drawing)

- ① 扫线电磁铁接口
- ② 气动阀接口
- ③ 大盘传感器
- ④ 送扣接口
- ⑤ 面板通讯接口
- ⑥ 机头灯接口
- ⑦ 脚踏接口



图 1-2-2 控制器接口定义 (controller connection plug definition)

注：使用正常力量插不进去时，请检查插头与插座是否匹配，插入方向或针的方向是否正确！

If it cannot be inserted normally, please check the plug and socket match or not, the direction of the insertion or the direction of the needle is correct or not.

1.3 接线与接地

必须要做好系统的接地工程，请合格的电气工程人员予以施工。产品通电及投入使用前，必须确保电源插座 AC 输入端已安全可靠的接地。系统的接地线为黄绿线，该地线请务必可靠连接至电网安全保护接地上，以保证安全使用，并可防止出现异常情况。

The grounding of the system must be completed, and qualified electrical engineers shall be required to construct. Before the product is energized and put into use, it is necessary to ensure that the AC input already connected the grounding. The standard grounding line is the yellow and green line. The ground wire must be reliably connected to the grid safely to protect grounding and ensure safely using and to prevent abnormal conditions.

注：所有电源线、信号线、接地线等接线时不要被其它物体压到或过度扭曲，以确保使用安全。

All power wires, signal wires, ground wires and other wiring should not be pressed or distorted by other objects to ensure safety.

2 操作面板使用说明 Operation panel introductions

2.1 操作面板的显示说明 display introduction

根据系统工作状态，操作面板的液晶屏将显示当前的缝纫状态。操作面板外观如下所示。According to the working status of the system, the LCD of the operation panel will display the current sewing status. The appearance of the operation panel is shown as below.

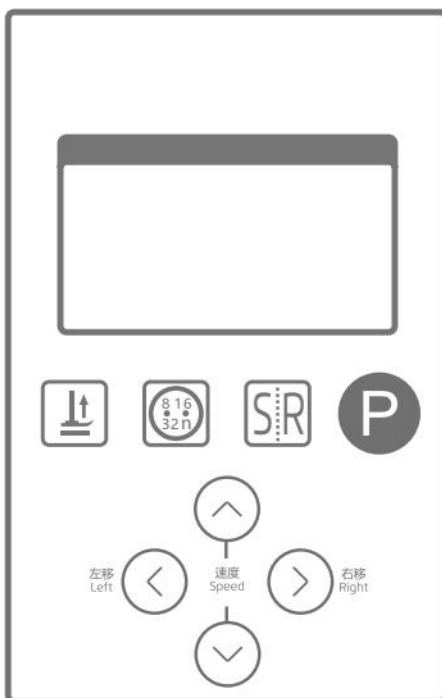








图 2-1 操作面板外观界面 appearance of operation panel










2.2 操作面板各按键功能说明 function declaration of each key










序号	外观	名称	功能描述
1		针数选择 Button sewing pin select	1、短按针数选择按键，切换运行针数在 8，16，32 针循环 2、长按针数选择按键，进入针数自定义选择模式 1、Short press to select the stitch num, between 8, 16, 32 2、Long press to enter the DIY stitch num mode
2		抬压脚键（锁机与解锁功能） Press up (Lock or unlock)	短按抬压脚键，锁机或解锁（待机界面时） Short press to lock or unlock the machine

3		进入参数区功能键 Parameter mode	长按 2s 进入参数界面 Long press 2 seconds to enter the parameter function
4		参数加键（速度加） Up key (speed up)	在进入参数功能参数号/值加，初始待机下速度加 Enter this mode, adjust this key, increase speed
5		参数减键（速度减） Down key (speed down)	在进入参数功能参数号/值加，初始待机下速度减 Enter this mode, adjust this key, decrease speed
6		左移键 Key left	参数设定中，向左选择参数范围 Turn to left to choose parameter
7		右移键 Key right	参数设定中，向右选择参数范围 Turn to right to choose parameter
8		恢复键 Reset key	1、短按自动找零位 2、长按 3S 后恢复出厂设置 1、Short press to find the zero position 2、press 3 seconds, then back to factory setting

3 参数调节 Parameter adjustment

3.1 进入操作员参数模式及保存 Enter parameter mode and saving

空闲模式下，长按  键进入操作员参数模式。按  或  移动光标，相应位数值闪烁，再按  或  修改该位数值，按  或  键，保存参数。如果参数未修改，按  键退出参数模式；如果参数已经修改，第一次按键保存参数，第二次按  键退出参数模式。

Press  to enter parameter mode, then press  or  to move the lit, corresponding number flashing, then press  or  to modify this value, press  or  to save the parameter. If not modified, press  to log out parameter mode, if already modify, firstly save parameter, then press  to log out parameter mode.

3.2 进入技术员参数模式及保存 Enter technician parameter mode and save it

按住  键开机进入技术员参数模式。参数调节方式同操作员参数调节方式。

Press **P** and turn on the machine to enter technician parameter mode. The method is the same as parameter mode.

3.3 速度调节 Speed adjustment

在空闲模式下，按上键 \uparrow 下键 \downarrow 调速度。向上调快，向下调慢，每按一次调整数值 50，可以长按连续加减。

Press \uparrow and \downarrow to adjust the speed. For up, to adjust fast, for down, to adjust slow. Each adjustment value is 50.

3.4 恢复出厂设置 Factory setting

长按 **SR** 恢复出厂设置，作为恢复出厂设置的快捷方式。

Press the **SR** for a long time, back to the factory setting.

3.5 进入监控模式 Enter monitoring system

在空闲模式下，按 **P** + **U** 键进入，按上下键调整监控参数项，按 **P** 键退出。（若为 24、25、26 项，长按 **P** 键保存当前监控值为对应参数，若保存成功，显示 OK，短按 **P** 键退出监控模式）

Press **P** + **U** to enter this mode, press up and down key to adjust this parameter, press **P**, then can log out. (if it is 24、25、26, then press **P** to save this monitoring value as the corresponding parameter, if save successfully, show OK, press **P** for short time to log out this mode.)

注：上停针位置设置：进入监控参数项 24，将手轮调整至上停针（参数会随着手轮位置而变化），长按 **P** 键保存参数（保存后，下针位会自动进行相应调整），按 **P** 键退出监控模式。

PS: Needle position setting, enter monitoring mode number 24, move the hand wheel to up needle position (the value will be changed with hand wheel position), press **P** for long time to save it (after save it, down needle position will be adjust automatically), press **P** to log out this mode.

3.6 进入计件快捷显示及修改 Enter the quick display and modify of piece counting

在空闲模式下，按 **P** + \uparrow 键进入计件快捷显示及修改界面，可通过按 \downarrow 键直接修改件数，按 **P** + \downarrow 键清除当前计件数，短按 **P** 退出当前界面。

Press **P** + \uparrow to enter the quick display and modify of piece counting, press \downarrow modify the counting directly. Press **P** + \downarrow to clear the current data, press **P** short to log out this interface.

3.7 参数表 Parameters list

3.7.1 操作员参数(长按 P 键进入) technician mode parameter (long press P key to enter)

参数项 Parameter List	参数描述 Description	默认值 Default Value	参数范围 Parameter range	参数项 Parameter List	参数描述 Description	默认值 Default Value	参数范围 Parameter range
P02	缝纫速度(r/min) High speed	1500	200-1500	P24	踏板后踏位置 Pedal position of trimming	350	0-4095
P04	找零速度(r/min) Reset sewing speed	500	200-1000	P27	扫线&送扣开关 Wiper switch 0: 关闭 1: 开启	0	0-1
P08	软启动针数 Soft start sewing stitch	3	1-3	P31	后踩中停关闭使能 Middle stop close enable 0: 开启后踩停车 enable middle stop 1: 关闭后踩停车 disable middle stop	0	0-1
P09	软启动开关 Soft start sewing switch	0	0-1	P32	扫线电磁铁全出力时间 Wiper action time with full power	40	0-200
P16	连踩间隔时间 Continue sew delay time	100	50-2000	P33	扫线电磁铁周期开通时间 Wiper action time each period	60	0-100
P20	抬压脚提前角度 Press start angle	85	0-250	P35	扫线提前角度 Wiper start angle	20	0-50
P22	送扣提前角度 Advance angle of buckle feeding	120	5-250	P36	扫线时间 Wiper action time	80	0-500

3.7.2 技术员参数表 (按住 P 键再开机进入) Technician Parameter list (Press P and switch on to enter)

参数项 Parameter List	参数描述 Description	默认值 Default Value	参数范围 Parameter range	参数项 Parameter List	参数描述 Description	默认值 Default Value	参数范围 Parameter range
P54	背光亮度 Backlight brightness	100	20-100	P85	安全开关报警恢复时间 (ms) The recovery time of Safety switch alarm	50	1-200
P56	上电自动找零位 connect power and finding needle position automatically 0: 不找 No 1: 找 Yes	1	0-1	P88	计件数计数单位 unit of counting	1	1-50
P58	上停针调整角度 adjustment angle of up needle position	65	0-359	P89	计件数总数设定 setting of total counting	9999	0-9999
P60	测试速度(r/min) testing speed	1500	200-1500	P90	计件数模式选择 counter mode 0: 关闭 off 1: 升序循环	1	0-6

					计数 Ascending cycle count. 2: 降序循环计数 Descending cycle count. 3: 升序计数, 计满报警并停止运行 (Ascending accounting to full, alarm and stop running) 4: 降序计数, 减为 0 报警并停止运行 (Descending accounting to 0, alarm and stop running) 5: 升序计数, 计满报警提示, 继续运行 (Ascending accounting to full, remind and keep running) 6: 降序计数, 减为 0 报警提示, 继续运行 (Descending accounting to 0, alarm and keep running) 注: 短按 P 取消报警 (note: press P shortly to cancel alarm)		
P62	特殊运行模式 special running mode 0: 正常 normal 2: 初始角测试 initial angle testing 3: 自动测试模式 automatic testing mode	0	0-3	P134	步进电机零位位置 Step motor down position	1100	0-4800
P63	老化停止时间(s) aging stopping time	2	1-255	P173	步进电机抬压脚位置 Step motor up position	1100	0-4800
P66	机头保护开关检测 protection switch of machine head testing	0	0-1	P177	步进电机放压脚速度 Press down speed	200	100-800
P67	机头保护开关逻辑 protection switch of machine head	1	0-1	P179	步进电机抬压脚速度 Press up speed	700	400-800
P72	踏板半前踏开始位置(相对于回中位置) starting position of half pressing	800	0-4095	P181	压脚下放保护时间 Press Down Protect Time	40	20-200
P73	踏板半前踏结束位置(相对于回中位置)end position of half pressing	1000	0-4095	P193	软启动第一针限速 Soft start first stitch speed	500	200-1500
P74	踏板模拟量最大值 Max value of pedal analog	3800	0-4095	P194	软启动第二针限速 Soft start second stitch speed	900	200-1500
P75	踏板回中位置设定 setting of pedal back to middle position	1650	0-4095	P195	软启动第三针限速 Soft start third stitch speed	1300	200-1500
P84	安全开关报警确认时间 (ms) The confirmation time of Safety switch alarm	300	1-500				

3.7.3 监控参数表(开机后按 P 键+抬压脚键进入) Monitoring parameter list (press P + press foot lifter key to enter)

参数编号 number	参数描述 description	参数编号 number	参数描述 description
M10	针数计数值 Stitches account number	M23	初始角度 Initial angle
M11	件数计数值 Pieces account number	M24	机械角度 Mechanical angle
M13	操作面板软件版本号 Panel version number	M25	踏板前踩模拟量最大值 Max value for pedal forward press
M18	控制器主板软件版本号 Main board version number for control box	M26	踏板回中模拟量采样值 Sample value for pedal back
M20	母线电压 Generatrix voltage	M30-M37	历史故障代码 Historical Error number
M21	机头速度 Machine speed		

4 错误代码 Error code

4.1 故障代码表 Error code list

若系统出现报错或报警，请首先检查如下项：1 先确认机器的连接线是否连接完好；2 确认电控和机头是否匹配；3 确认恢复出厂是否准确。

if have Error or alarm, please check first as follows:1. Check the connection wire is connected or not; 2. Check the machine head is matched with the control box; 3. check reset is accurate or not.

故障代码 Error number	代码含义 Code meaning	解决措施 Solutions
Err-01	主轴电机硬件过流 Arm shaft motor hardware overcurrent	1、 关闭系统电源，30 秒后重新接通电源。 1. Turn off the system power, and turn it on again after 30 seconds.
Err-02	主轴电机硬件过流 Arm shaft motor software overcurrent	2、 检查主轴电机编码器、电控是否有损坏等不良现象若有则及时更换。 2. Check whether the arm shaft motor encoder and electronic control are damaged or in other poor conditions. If so, replace them in time.
Err-03	系统欠压	3、 排除后重启系统若仍不能正常工作，请联系当地服务商或拨打 4008876858 3. If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858.
		断开控制器电源，检查输入电源电压是否低于 176V。若电源电压低于

	System undervoltage	176V, 请在电压恢复正常后重新启动控制器。若电压恢复正常后, 启动控制器仍不能正常工作。请联系当地服务商或拨打 4008876858。 Disconnect the power supply of the controller and check whether the input power supply voltage is lower than 176V. If so, please restart the controller after the voltage returns to normal. If the voltage returns to normal, it still does not work properly after the controller starts up, please contact your local service provider or call 4008876858.
Err-04	停机时过压 Overvoltage during shutdown	断开控制器电源, 检查输入电源电压是否高于 264V。若电源电压高于 264V, 请在电压恢复正常后重新启动控制器。若电压恢复正常后, 启动控制器仍不能正常工作。请联系当地服务商或拨打 4008876858 Disconnect the controller power and check whether the input power voltage is higher than 264V. If so, please restart the controller after the voltage returns to normal. If the voltage returns to normal, it still does not work properly after the controller starts up. Please contact your local service provider or call 4008876858.
Err-05	运行时过压 Overvoltage during operation	断开控制器电源, 检查输入电源电压是否高于 264V。若电源电压高于 264V, 请在电压恢复正常后重新启动控制器。若电压恢复正常后, 启动控制器仍不能正常工作。请联系当地服务商或拨打 4008876858 Disconnect the controller power and check whether the input power voltage is higher than 264V. If so, please restart the controller after the voltage returns to normal. If the voltage returns to normal, it still does not work properly after the controller starts up. Please contact your local service provider or call 4008876858.
Err-07	主轴电机电流检测回路故障 Arm shaft motor current detection circuit failure	关闭系统电源, 30 秒后重新接通电源观察是否能正常工作。重试几次, 若该故障频繁出现。请联系当地服务商或拨打 4008876858。 Turn off the system power, and turn on the power again after 30 seconds to see whether it can work properly. Try a few times again. If the fault occurs frequently, please contact your local service provider or call 4008876858.
Err-08	主轴电机堵转 Arm shaft motor stalled	1、 请检查是否有异物缠绕在机头上 1、 Please check whether there is any foreign object wrapped around the machine head 2、 断开控制器电源, 检查主轴电机电源输入插头是否脱落、松动、破损。 2、 Disconnect the power supply of the controller and check whether the input plug of the arm shaft motor power supply is detached, loose, or damaged. 3、 排除后重启系统仍不能正常工作。请联系当地服务商或拨打 4008876858。 3、 If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858.
Err-10	面板通讯故障 Panel communication failure	1、 请检查操作面板与电控的连线是否脱落、松动、断裂。 1、 Please check whether the connection between the operation panel and the electric control is drops off, loose, or broken. 2、 排除后重启系统若仍不能正常工作。请联系当地服务商或拨打 4008876858 2、 If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858.
Err-12	主轴电机初始角度检测故障	1、 请进入参数项里检查主轴电机初始角度。 1、 Please enter parameter setting to check the initial angle of the arm

	Arm shaft motor initial angle detection failure	shaft motor. 2、请断电后再尝试 2-3 次，若仍报故障。请联系当地服务商或拨打 4008876858。 2、 Please try 2-3 times again after power off. If it still fails. Please contact your local service provider or call 4008876858.
Err-13	主轴电机零位故障 Arm shaft motor zero position fault	1、关闭系统电源，检查主轴电机编码器接头是否松动或脱落，将其恢复正常后重启系统。 1. Turn off the power of the system, check whether the arm shaft motor encoder connector is loose, or drops off. Restore it to normal and restart the system. 2、更换主轴电机编码器。 2、 Replace the arm shaft motor encoder. 3、排除后重启系统若仍不能正常工作请联系当地服务商或拨打 4008876858。 3、 If the system still does not work properly after troubleshooting and restart, Please contact your local service provider or call 4008876858.
Err-14	主控 eeprom 元器件读写故障 Master control eeprom components read/write failure	关闭系统电源，30 秒后重新接通电源，控制器若仍不能正常工作，请联系当地服务商或拨打 4008876858 Turn off the system power, and then turn on the power again after 30 seconds. If the controller still does not work properly, please contact your local service provider or call 4008876858
Err-15	主轴电机超速保护 Arm shaft motor overspeed protection	
Err-16	主轴电机反转 Arm shaft motor reverse	
Err-17	面板参数读写故障 Panel date read/write failure	关闭系统电源，30 秒后重新接通电源，控制器若仍不能正常工作，请联系当地服务商或拨打 4008876858 Turn off the system power, and then turn on the power again after 30 seconds. If the controller still does not work properly, please contact your local service provider or call 4008876858
Err-18	主轴电机过载 Arm shaft motor overload	检查主轴电机是否堵转，若未堵转，请联系当地服务商或拨打 4008876858。 Check whether the arm shaft motor is stalled. If not, please contact your local service provider or call 4008876858.
Err-19	电机类型不匹配 Motor type mismatch	关闭系统电源，30 秒后重新接通电源，控制器若仍不能正常工作，请联系当地服务商或拨打 4008876858 Turn off the system power, and then turn on the power again after 30 seconds. If the controller still does not work properly, please contact your local service provider or call 4008876858
Err-20	调速器异常 Pedal failure	1、请检查脚踏控速器连接线是否脱落、松动或脚踏控速器是否损坏。 1、 Please check whether the connection cable of the pedal speed controller is drops off, loose, or damaged. 2、排除后重启系统仍不能正常工作。请联系当地服务商或拨打 4008876858。 2、 If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858.
Err-21	步进电机硬件过流 Step motor hardware overcurrent	1、关闭系统电源，30 秒后重新接通电源 1、 Turn off the system power, and then turn on the power again after 30 seconds 2、断电后，检查机器器器抬压步进电机是否卡死，恢复正常状态后，重启系统

		<p>2.、 Check whether the backstitch step motor, swing seat, and teeth are stuck. After returning to the normal state, restart the system.</p> <p>3、排除后重启系统若仍不能正常工作,请联系当地服务商或拨打 4008876858</p> <p>3.、 If the system still does not work properly after troubleshooting and restart.Please contact your local service provider or call 4008876858</p>
Err-22	步进电机软件过流 Step motor software overcurrent	<p>1、关闭系统电源, 30 秒后重新接通电源</p> <p>1、 Turn off the system power, and then turn on the power again after 30 seconds</p> <p>2、断电后, 检查机器抬压步进电机是否卡死, 恢复正常状态后, 重启系统</p> <p>2、 Check whether the press-up step motor, swing seat, and teeth are stuck. After returning to the normal state, restart the system.</p> <p>3、排除后重启系统若仍不能正常工作。请联系当地服务商或拨打 4008876858</p> <p>3、 If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858</p>
Err-23	步进电机电流检测回路故障 Step motor current detection circuit failure	<p>关闭系统电源, 30 秒后重新接通电源, 控制器若仍不能正常工作, 请联系当地服务商或拨打 4008876858。</p> <p>Turn off the system power, and then turn on the power again after 30 seconds. If the controller still does not work properly, please contact your local service provider or call 4008876858.</p>
Err-24	步进电机堵转 Step motor stalled	<p>1、关闭系统电源, 30 秒后重新接通电源</p> <p>1、 Turn off the system power, and then turn on the power again after 30 seconds</p> <p>2、断电后, 检查机器抬压步进电机是否卡死, 恢复正常状态后, 重启系统</p> <p>2、 Check whether the press-up step motor, swing seat, and teeth are stuck. After returning to the normal state, restart the system.</p> <p>3、检查倒缝步进编码器、电控是否有损坏等不良现象若有则及时更换</p> <p>3、 Check whether the backstitch step encoder and electronic control are damaged or in other poor conditions. If so, replace them in time.</p> <p>4、排除后重启系统若仍不能正常工作。请联系当地服务商或拨打 4008876858</p> <p>4、 If the system still cannot work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858</p>
Err-28	步进电机零位故障 Step motor zero position fault	<p>1、断电后, 检查机器抬压步进电机是否卡死, 恢复正常状态后, 重启系统</p> <p>1、 Check whether the press-up step motor, swing seat, and teeth are stuck. After the normal state is restored, restart the system.</p>
Err-29	步进光编 AB 信号异常 Reverse stitch stepping motor encoder AB signal abnormal	<p>2、检查抬压步进编码器是否有损坏等不良现象若有则及时更换</p> <p>2、 Check whether the press-up step encoder is damaged or in other poor conditions. If so, replace it in time.</p> <p>3、排除后重启系统若仍不能正常工作。请联系当地服务商或拨打 4008876858</p> <p>3、 If the system still does not work properly after troubleshooting and restart. Please contact your local service provider or call 4008876858</p>

4.2 安全报警表 Safety alarm meter

报警代码 Alarm code	代码含义 Description	解决措施 Solutions
A-UP	翻抬开关报警 Alarm of safety switch	摆正机头,确保翻抬开关复原 Return machine head to normal position, to make sure safety switch rebound
ALR-1	机头按钮短路报警 Alarm of machine head button with short circuit	关闭系统电源, 更换机头灯按钮 Turn off system power and change the light button of machine head
ALR-2	计针数计满报警 Alarm when needle counting is fulfilled	短按 P 键取消报警 Press P key with short time, alarm will stop
ALR-3	计件数计满报警 Alarm when needle counting is fulfilled	短按 P 键取消报警 Press P key with short time, alarm will stop
RESET	请求找零位 Ask for reset	短按 P 键或 S/R 键找零位 Press P or S/R key with short time,
ALR-9	零位传感器报警 Zero position sensor failure	短按 P 键取消报警, 检查传感器是否正常工作 Press P key with short time, alarm will stop, check the sensor