

嵌入式数控交流伺服系统 使用说明书

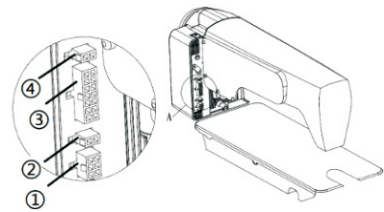
安全事项

- 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以牢固的方式与大地有效连接。
- 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。
- 本手册中标有△符号之处为安全注意点，必须注意并严格遵守，以免造成不必要的损害。

第1章 产品安装

1.1 产品规格

产品型号	AHE59-55	电源电压	AC 220±20% V
电源频率	50Hz/60Hz	最大输出功率	550/750W



例图1-1 AHE系列控制器图

1.2 接口插头的连接

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如图1-1所示，各插座名称如图1-2所示。连接好，请检查插头是否插牢。

①脚踏板插座；②抬压脚电磁铁插座；③自动电磁铁插座；④机头灯插座（黑色）；

注：图1-1以AHE-58系列为例，AHE-59系列无④。

△：使用正常的力量插不进去时，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！照明灯接口和抬压脚电磁铁接口都是1*2的接口，机头照明灯接口使用黑色接口，请注意区分。

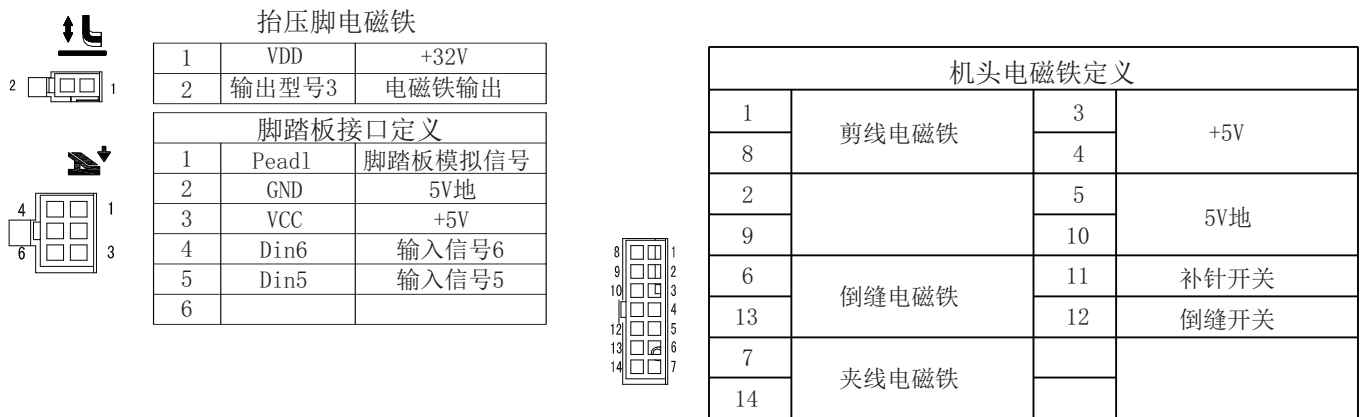


图1-2 控制器接口定义

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。

△：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！

第2章 操作面板使用说明

2.1操作面板的显示说明



图2-1 H-12操作面板外观界面

2.2按键功能介绍

序号	外观	名称	功能描述
1		菜单键	1. 长按键，进入菜单列表，菜单列表中包括主要功能、参数设置、计数器设置、网络设置、维修保养和系统设置功能。 2. 在菜单模式下，短按一次键进行保存，再次按下返回上一级，长按返回主界面。
2		自由缝和剪线键	1. 短按此键，选择自由缝模式。 2. 长按此键，选择剪线功能开关。
3		前加固和软启动键	1. 短按此键，系统前固缝工作模式将按照无前固缝↓、前单固缝↗、前双固缝↘、前四固缝↖之间循环选择，点阵屏显示对应的图标。 2. 长按此键，系统进入软启动↗设置设置界面。
4		夹线和触发键	1. 短按此键，选择夹线功能开关。 2. 长按此键，选择触发功能开关。
5		后加固缝和停针选择键	1. 短按此键，系统后固缝工作模式将在无后固缝↓、后单固缝↘、后双固缝↖、后四固缝↗之间循环选择，点阵屏显示对应的图标。 2. 长按此键，选择停针位置。
6		Reset键	长按恢复厂家出厂参数。
7		W缝/多段缝键	1. 短按此键，选择W缝工作模式。 2. 长按此键，选择多段缝模式。
8		抬压脚键	1. 短按此键，系统进入剪线抬压脚↘设置界面。 2. 长按此键，系统进入缝纫中停车自动抬压脚↗设置界面。
9		增减键	调整对应数值的增加键与减小键。
10		增减键	调整对应数值的增加键与减小键。
11		左右切换键	切换选中对象，切换工作模式。
12		左右切换键	切换选中对象，切换工作模式。

2.3组合按键功能介绍

停针位调节：按下 + 键面板显示机械角后转动手轮，位置确认后按下 键待面板显示“0000”后再次按 键返回至主界面。

跑和模式：按下 + 键进入自动跑和模式，在此状态下按 选择运行时间、停止时间及跑和总时间。

基本参数调节：按下 + 键快捷进入机修工参数。

高级参数调节：按下 + 键快捷进入高级参数。

第三章 参数代码表

3.1 机修工参数表

参数编号	参数范围	典型值	参数描述
100	100~800	200	起缝速度
101	200~5000	4500	自由缝最高速（全局最高限速）
102	200~5000	3000	多段缝最高速
103	200~5000	5000	手动倒缝最高限速
104	200~5000	200	补针速度
105	100~500	300	剪线速度
106	0/1	0	慢启动模式
107	1~9	1	慢速起缝针数
108	100~800	400	慢速起缝速度
110	200~2200	1800	前固缝速度
111	200~2200	1800	后固缝速度
112	200~2200	1800	连续回缝速度（W缝）
113	1~70	32	前固（及W）缝针迹补偿1（吸合补偿，数值增大表示加快吸合）
114	1~70	21	前固（及W）缝针迹补偿2（释放补偿，数值增大表示释放加快）
115	1~70	35	后固缝针迹补偿1（吸合补偿，数值增大表示加快吸合）
116	1~70	21	后固缝针迹补偿2（释放补偿，数值增大表示释放加快）
140	0/1	0	上电自动找上针位： 0:不找；1:找
141	0/1	1	自动加固功能选择：（无自动加固功能的机头，最好禁止此功能） 0:禁止固缝；1:允许固缝
142	0/1	0	手按回缝时功能模式选择 0:在缝纫中途或中途停止时均有动作。 1:仅在缝纫中途有动作。

3.2 高级参数表

参数编号	参数范围	典型值	参数描述
109	1~20	18	加速灵敏度
10A	1~20	18	减速灵敏度
117	1~100	90	针迹速度补偿（P107=A段针数=1）
118	1~100	30	针迹速度补偿（P107=A段针数）
11B	0~4	0	前后加固模式类型。（CD与AB类似） 0: B->AB->ABAB->无。 1: B->无。 2: B->AB->无。 3: AB->无。 4: AB->ABAB->无。
11C	0~9999	0	ABCD各段的十位数（按位分配）
11D	0~9999	0	EFGH各段的十位数（按位分配）
11E	0~9999	0	ABD各段的十位数（按位分配）
11F	0~359	0	手动倒缝角度控制
130	0/1/2/3	2	脚踏板曲线模式： 0: 自动线性斜率（根据最高速自动计算） 1: 两段斜率； 2: 幂次曲线； 3: S型曲线
131	200~4000	3000	两段斜率：中段速度RPM（两段斜率的转折点速度）

参数编号	参数范围	典型值	参数描述
132	0~1024	800	两段斜率：中段踏板模拟量（需在138到139参数之间）
133	1/2	1	幂次曲线： 1：平方曲线；2：开方曲线；
134	0~1024	150	踏板剪线位置
135	0~1024	300	踏板抬压脚位置
136	0~1024	450	踏板回中位置
137	0~1024	465	踏板前踩运行位置
138	0~1024	680	踏板低速运行位置（上限）
139	0~1024	940	踏板模拟量最大值
13A	0~800	300	踏板抬压脚确认时间
143	0/1/2/3	0	特殊运行模式： 0：操作工选择（正常） 1：简易缝模式 2：测电机初始角（不需要取下皮带） 3：计算传动比模式（需要有停针传感器，且不能取下皮带）
144	0~31	0	电机低速加力功能开关：0：正常功能；1~31：低速加力过厚能力档位
148	0/1/2	0	按钮补针模式：0：由按下时间控制；1：补半针；2：补一针
149	0~10	5	缓放压脚斩波开通时间(100us单位)
14C	1~9999	0	缓放压脚斩波关断时间(100us单位)
150	1~100	1	计针数功能比例值设定
151	1~9999	1	计针数上限设定值
152	1~6	0	计针数模式选择： 0：不计数 1：依针数递增计数，计数满后自动重新计数 2：依针数递减计数，计数满后自动重新计数 3：依针数递增计数，计数满后马达自动停止，须由复位按钮设定或面板上的P键来启动重新计数。 4：依针数递减计数，计数满后马达自动停止，须由复位按钮设定或面板上的P键来启动重新计数。 5：依针数递增计数，计数满后发出报警，剪线后马达锁住 6：依针数递减计数，计数满后发出报警，剪线后马达锁住
153	1~100	1	计件数功能比例值设定
154	1~9999	1	计件数上限设定值
155	0~4	0	计件数模式选择： 0：不计数 1：计件数递增计数，计数满后自动重新计数 2：计件数递减计数，计数满后自动重新计数 3：计件数递增计数，计数满后马达自动停止，须由复位按钮设定或面板上的P键来启动重新计数。 4：计件数递减计数，计数满后马达自动停止，须由复位按钮设定或面板上的P键来启动重新计数。
156	0~9999	0	对应1/2/3/4号电磁铁斩波占空比时间选择（0以ms为单位，1以0.1ms为单位）
157	0~9999	0	对应5/6/7/8号电磁铁斩波占空比时间选择（0以ms为单位，1以0.1ms为单位）
158	0~1	0	计数可调开关（计针数和计件数）（0可调，1不可调）
161	0/1/2	2	参数传输：0：无动作；1：下传参数；2：上传参数
163	1/2	0	保存当前参数为用户自定义机修参数（可恢复）
164	-	0	密码

具体设置方法见图4-1所示。

参数编号	参数范围	典型值	参数描述
200	0/1/2	0	剪线电机运行模式选择：0：平车式；1：绷缝式（普通绷缝剪线：停到上针位后剪线）；2：包缝式：手动剪线
201	0~359	0	剪线结束时机械角度
203	5~359	10	剪线开始角度TS（相对于下针位角度）
204	10~359	180	剪线结束角度TE（相对于下针位角度，需大于TS）
20A	10~60	50	剪线加力系数(电机加力)
20B	0/1	0	尾针加密功能开关
211	5~359	30	松线电磁铁启动角度LS（相对于下针位角度）
212	10~359	300	松线电磁铁结束角度LE（相对于下针位角度，需大于LS）
213	1~999	1	松线电磁铁启动延迟时间L1（ms）
214	1~999	10	松线电磁铁上针位后延迟时间L2（ms）
215	0/1	0	扫线功能选择：0：关闭；1：打开
216	1~999	10	拨线 / 扫线延迟时间ms
217	1~9999	30	拨线 / 扫线持续时间ms
219	0/1	1	夹线功能选择：0：关闭；1：打开
21A	10~359	120	夹线开始角度
21B	11~359	320	夹线结束角度
21E	11~359	120	夹线时压脚抬起后的下放角度
220	200~360	360	剪线后停止位置（可实现剪线回拉功能）
231	0/1	0	自动测试模式选择：（前面两位数所表示的测试模式设置）0：定针数；1：定时间（×100ms）
232	0~1000	300	安全开关报警确认时间ms（直驱翻台开关和绷缝剪刀保护开关均同样处理）
234	0/1	0	电机转向：1：反转；0：正转
240	0~9999	1000	电机/机头传动比：X0.001 （如果自动计算过传动比，控制器内的该参数可能与HMI上的不同）
242	0~359	209	上停针位调整角度（相对于上针位传感器的位置偏移）
243	0~359	179	下停针位机械角度
244	0~800	50	放压脚延迟时间（ms）
247	850~1350	1030	尾针加密电磁铁吸合角度
248	0~300	220	电磁铁释放时间
249	0~50	25	电磁铁占空比

第四章 故障代码表

4.1 监控参数表

参数编号	参数描述	参数编号	参数描述	参数编号	参数描述
010	针数计数	022	相电流	027	电机累计运行时间（Hour）
011	计件数	023	初始角度	028	机头交互量电压采样值
013	霍尔状态	024	机械角度	029	DSP软件版本号
020	母线电压	025	踏板电压采样值	030-037	历史故障代码
021	机头速度	026	机头传动比实际值		

4.2 安全报警表

报警代码	代码含义	解决措施
Warm:01	加油提醒	按P键可暂时取消报警。请及时加油并运行时间复位操作
Warm:02	计针数报警	表示计针数已达所设上限，按P键可取消报警并重新计数
Warm:03	计件数报警	表示计件数已达所设上限，按P键可取消报警并重新计数
Warm:04	紧急停车	再按下紧急停车按钮，可消除紧急停车状态
Warm:05	提针锁定	再按下提针锁定按钮，可消除提针锁定状态
Warm:06	断电提醒	请等候30秒再重新打开电源开关

4.3 故障代码表

故障代码	代码含义	解决措施
Error:01	硬件过流	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，请更换控制器并通知厂方。
Error:02	软件过流	
Error:03	系统欠压	断开控制器电源，检查输入电源电压是否偏低（低于176V）。若电源电压偏低，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，请更换控制器并通知厂方。
Error:04	停机时过压	断开控制器电源，检查输入电源电压是否偏高（高于264V）。若电源电压偏高，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，请更换控制器并通知厂方。
Error:05	运行时过压	
Error:06	电磁铁回路故障	关闭系统电源，检查电磁铁连线是否正确，是否有松动、破损等现象。若有则及时更换。确认无误后重启系统，若仍不能工作，请更换控制器并通知厂方。
Error:07	电流检测回路故障	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，请更换控制器并通知厂方。
Error:08	电机堵转	断开控制器电源，检查电机电源输入插头是否脱落、松动、破损，是否有异物缠绕在机头上。排除后重启系统仍不能正常工作，请更换控制器并通知厂方。
Error:09	制动回路故障	关闭系统电源，检查电源板上白色的制动电阻接头是否松动或脱落，将其插紧后重启系统。若仍不能正常工作，请更换控制器并通知厂方。
Error:10	HMI通讯故障	检查控制面板与控制器的连线是否脱落、松动、断裂，将其恢复正常后重启系统。若仍不能正常工作，请更换控制器并通知厂方。
Error:11	机头停针信号故障	检查机头同步信号装置与控制器的连线是否松动，将其恢复正常后重启系统。若仍不能正常工作，请更换控制器并通知厂方。
Error:12	电机初始角度检测故障	请断电后再尝试2-3次，若仍报故障，请更换控制器并通知厂方。
Error:13	电机HALL故障	关闭系统电源，检查电机传感器接头是否松动或脱落，将其恢复正常后重启系统。若仍不能正常工作，请更换控制器并通知厂方。
Error:14	DSP读写EEPROM故障	关闭系统电源，30秒后重启系统，若仍不能正常工作，请更换控制器并通知厂方。
Error:15	电机超速保护	
Error:16	电机反转	

故障代码	代码含义	解决措施
Error:17	HMI读写EEPROM故障	关闭系统电源，30秒后重启系统，若仍不能正常工作，请更换控制器并通知厂方。
Error:18	电机过载	
Error:19	翻台报警	
Error:23	电机堵转扇区错误	断开控制器电源，检查电机电源输入插头是否脱落、松动、破损，是否有异物缠绕在机头上。排除后重启系统仍不能正常工作，请更换控制器并通知厂方。

附件：脚踏板灵敏度调整

脚踏板动作由初始位置①（136号参数）开始，缓慢向前踩至②（137号参数）开始低速缝纫，继续前踩至③（138号参数）开始加速，再深踩至④（139号参数）达到最高速度。②③段之间维持起缝速度，③④段之间为无级调速过程；

1、当脚踏板由初始位置①（136号参数）开始，缓慢后踩至⑤（135号参数）时抬压脚自动抬起；2、当脚踏板由初始位置①（136号参数）开始，缓慢后踩至⑥（134号参数）时自动完成剪线动作。3、各参数数值设置需保证（134号参数）<（135号参数）<（136号参数）<（137号参数）<（138号参数）<（139号参数）4、可通过监控模式下025号参数实时监测，不同位置下的踏板采样数值作为各参数的参考值。调整对应参数，抬压脚和前踩或后踩的动作位置也随之改变。如前踩很大距离机器还没有运转，可适当减小137参数（不能小于回中位置参数136），即可提高前踩的灵敏度；若机器过于灵敏，轻触踏板机器就开始运行，可适当加大137参数；若不容易补针，稍微前踩，速度就迅速提高造成前冲多针，可适当增大138参数或减小137参数（即增大脚踏板低速范围），也可以适当降低初始起缝速度（100）。

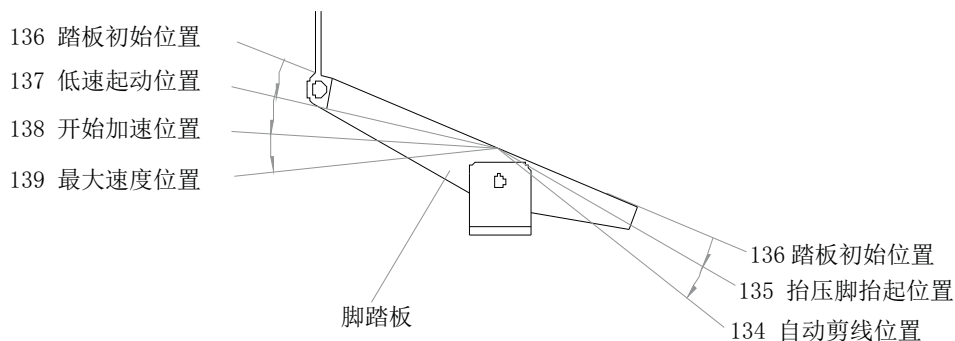



图4-1 踏板动作各位置参数示意图

AHE-59 Numerical Control AC Servo System User Manual

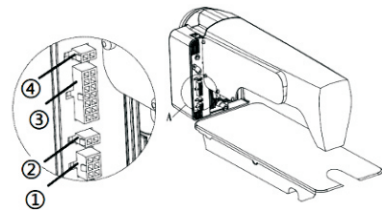
Safety Instructions

- Read the Product Specification and the attached sewing machine specification prior to using this product.
- This product shall be installed or operated by the people who have been trained professionally.
- Please stay away from the arc welding equipment, so as to avoid misoperation caused by the interference with this controller by the generated electromagnetic waves.
- Please do not use this product in the places with ambient temperature above 45°C or below 0°C.
- Please do not use this product in the places with humidity below 30% or above 95% or having dew or acid mist.
- Please turn off the power and pull the plug first prior to the installation of control cabinet and other components.
- In order to prevent interference or electric leakage, please the grounding shall be performed well. The grounding wire of the power line shall be connected to the earth firmly and effectively.
- All the parts for maintenance shall be provided or recognized by our Company.
- The power shall be turned off and the plug be pulled out prior to any maintenance. Only after the power is turned off for five minutes can the control cabinet be opened as the high voltage in it is dangerous.
- The clauses marked with  in this manual are about safety precautions, which shall be noted and strictly abided by, so as to avoid unnecessary damage.

Section 1 Product Installation

11 Product Specifications

Product Model	AHE59-55	Power Voltage	Ac220±20% V
Power Frequency	50Hz/60	HzMaximum Power Output	550/750W




Example Figure 1-1 AHE series controller diagram

1.2 Interface Plug Connection

Insert the pedal and head connector plugs into the corresponding sockets on the back of the controller as shown in Figure 1-1. The names of the outlets are shown in Figure 1-2. After connection, please check if the plug is inserted firmly.

① Pedal socket; ② Lifter electromagnet socket; ③ Automatic electromagnet socket; ④ Head light socket (black); Note: Figure 1-1 taking AHE-58 series as an example, AHE-59 series do not have ④.

 :In case of failure to plug in using normal force, please check if the plug and the socket match, and whether the insertion direction or the direction of needle is correct! The interfaces of the lamp and lifter electromagnet are both 1*2 interfaces. Back interface is adopted for the headlight interface. Please note the difference.

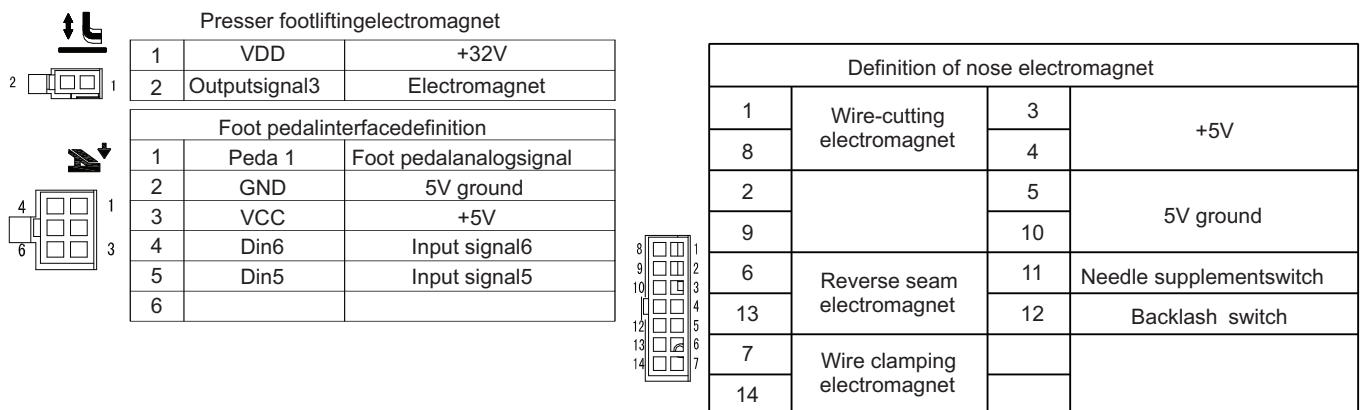



Figure 1-2 Controller Interface Definition

1.3 Wiring and Grounding

The systematic grounding engineering shall be done and constructed by qualified electrical engineer. Prior to the product is energized and put into use, the AC input terminal of power outlet shall be ensured to be grounded in a safe and reliable way. The grounding wire of the system is yellow-green line, which shall be connected to the power grid security grounding, so as to ensure safe use and prevent abnormal conditions.

 :Protect the power cords, signal cables, ground wires, etc. from being pressed by other objects or over-twisted during wiring to ensure safety in use!

Section 2 Operating panel instructions

2.1 Introduction to the Appearance of Operation Panel

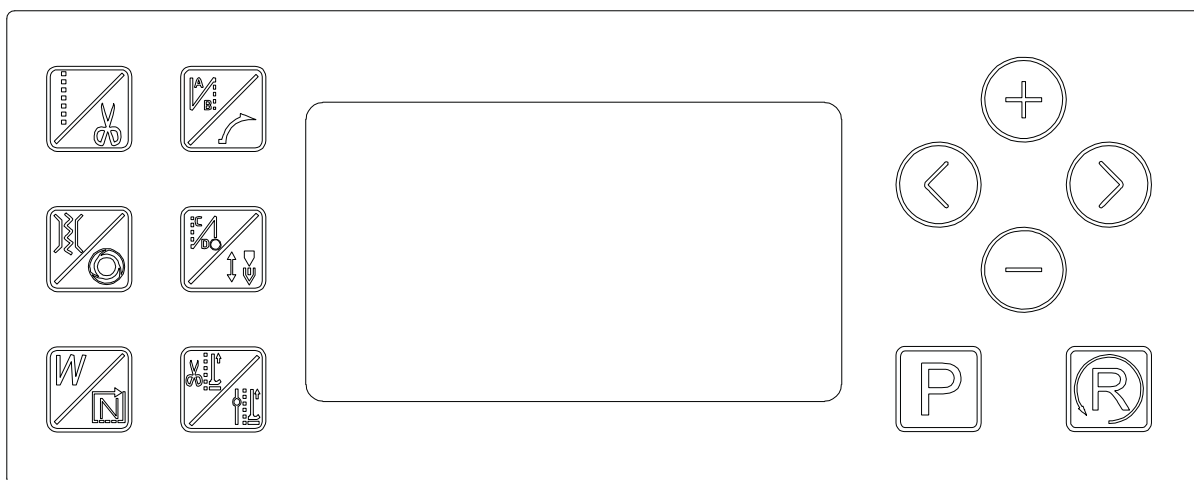










Figure 2-1 Appearance Operation Panel

2.2 按键功能介绍



No.	Appearance	Name	Function Description
1		Menu	<ol style="list-style-type: none"> 1.Press the P key for a long time to enter the menu list, which includes the main functions, parameter setting, counter setting, network setting, maintenance and system setting functions. 2.In menu mode, press the P key once for saving, press it again to return to the next level, and press it again to return to the main interface.
2		Free sewing and thread cutting keys	<ol style="list-style-type: none"> 1.Press this key briefly to select the free sewing mode. 2.Press this key for a long time to select the thread cutting function switch.
3		Front Reinforcement and Soft Start Reuse Keys	<ol style="list-style-type: none"> 1.By pressing this key briefly, the system's front fixing mode will be selected cyclically among no front fixing, front single fixing, front double fixing and front four fixing, and the dot matrix screen will display the corresponding icon. 2.Press this key for a long time to enter the soft start setting interface.
4		Clamping wire and trigger key	<ol style="list-style-type: none"> 1.Press this key briefly to select the wire clamping function switch. 2.Press this key for a long time to select the trigger function switch.
5		Select key for rear reinforcing seam and needle stop	<ol style="list-style-type: none"> 1.Press this key for a short time, and the working mode of the system's rear fixing seam will be cyclically selected among no rear fixing seam, rear single fixing seam, rear double fixing seam and rear four fixing seams, and the corresponding icon will be displayed on the dot matrix screen. 2.Press this key for a long time to select the needle stop position.
6		Reset	Long press to restore factory parameters.
7		W - seam / multi - seam key	<ol style="list-style-type: none"> 1.Press this key briefly to select W - seam operation mode. 2.Press this key for a long time to select the multi-section sewing mode.
8		Lifter key	Also known as automatic lifter after trimming and automatic lifter reuse key in suspension during sewing. including short press and long press. After short press, the system enters trimming lifter setting interface. After long press 2S, the system enters the automatic lifter setting interface.
9/10		Increase/decrease key	Adjust the increase/decrease key for the corresponding value
11/12		Left/right switch key	Switch the selected object and switch the operation mode

2.3 Introduction to function of combination key

Adjustment of needle stop position: Press the  +  key panel to display the mechanical angle and then turn the handwheel. After confirming the position, press the  key until the panel displays " 0000" and then press the  key again to return to the main interface.

Run and Mode: Press the  +  key to enter the automatic run and mode, and press   in this state to select the run time, stop time and run and total time.

Basic parameter adjustment: press  +  key to quickly enter mechanic parameters.

Advanced Parameter Adjustment: Press the  +  key to quickly enter advanced parameters.

Section 3 Parameter Code Table

3.1 Mechanic parameter table

Parameter Number	Parameter Range	Typical Value	Parameter Description
100	100~800	200	Initial stitching speed
101	200~5000	4500	Maximum free sewing speed (global maximum speed limit)
102	200~5000	3000	Maximum multi-segment sewing speed
103	200~5000	5000	Manual top down speed limit
104	200~5000	200	Stitch compensate speed
105	100~500	300	Trimming speed
106	0/1	0	Slow start mode
107	1~9	1	Number of slow initial stitches
108	100~800	400	Slow sewing speed
110	200~2200	1800	Start back tacking speed
111	200~2200	1800	End back tacking speed
112	200~2200	1800	Continuous stitching speed (W-sewing)
113	1~70	32	Start back tacking (and W) stitch trajectory compensate 1 (Absorption compensation, increased numerical value means accelerated absorption)
114	1~70	21	Start back tacking (and W) stitch trajectory compensate 2 (Release compensation, increased numerical value means accelerated release)
115	1~70	35	End back tacking stitch trajectory compensate 1 (Absorption compensation, increased numerical value means accelerated absorption)
116	1~70	21	End back tacking stitch trajectory compensate 2 (Release compensation, increased numerical value means accelerated release)
140	0/1	0	Power on automatic needle position search: 0: not searching; 1: searching
141	0/1	1	Automatic tacking function selection: (head without automatic tacking function, disabling the function is recommended) 0: Fixing prohibited; 1: Fixing allowed
142	0/1	0	Manual press backstitch function selection 0: It operates when it stops in the middle of sewing or halfway. 1: It only operates during sewing.

3.2 Advanced Parameter Table

Parameter Number	Parameter Range	Typical Value	Parameter Description
109	1~20	18	Accelerate sensitivity
10A	1~20	18	Decelerate sensitivity
117	1~100	90	Stitch speed compensation (P107-A segment stitch number = 1)
118	1~100	30	Stitch speed compensation (P107-A segment stitch number = 1)
11B	0-4	0	Start and end back tacking mode type. (CD is similar to AB) 0: B->AB->ABAB->None. 1: B->Nothing. 2: B->AB->None. 3:AB->None. 4: AB->ABAB->None.

Parameter Number	Parameter Range	Typical Value	Parameter Description
11C	0~9999	0	Ten digits of ABCD segments (allocations by bit)
11D	0~9999	0	Ten digits of EFGH segments (allocations by bit)
11E	0~9999	0	Ten digits of ABD segments (allocations by bit)
11F	0~359	0	Manual backstitch angle control
130	0/1/2/3	2	Pedal curve mode: 0: Automatic linear slope (automatic calculation according to the maximum speed) 1: two slopes; 2: power curve; 3: S curve
131	200~4000	3000	Two slopes: Mid-speed RPM (turning point speed for two slopes)
132	0~1024	800	Two slopes: Mid-range pedal simulation (between parameter 138 and 139)
133	1/2	1	Power curve: 1: Square curve; 2: Square root curve;
134	0~1024	150	Pedal trimming position
135	0~1024	300	Pedal lifter position
136	0~1024	450	Pedal back position
137	0~1024	465	Stepped forward stepping operation position
138	0~1024	680	Pedal low speed operation position (upper limit)
139	0~1024	940	Pedal simulation maximum value
13A	0~800	300	Pedal lifter confirmation time
143	0/1/2/3	0	Special operation mode: 0: Operator selection (normal) 1: Simple sewing mode 2: Measure the initial angle of motor (no need to remove the belt) 3: Calculate gear ratio mode (needle stop sensor is required, and the belt cannot be removed)
144	0~31	0	Motor low-speed booster function switch: 0: Normal function; 1~31: Low-speed booster over-thickness gear position
148	0/1/2	0	Key complement mode: 0: press to control time; 1: compensate for half stitch; 2: compensate for one stitch
149	0~10	5	Slow release presser pedal opening time (100us units)
14C	1~9999	0	Slow release presser pedal closing time (100us units)
150	1~100	1	Stitch counting function ratio setting
151	1~9999	1	Stitch counting upper limit setting value
152	1~6	0	Counting mode selection: 0: No count 1: Count up by the number of stitches, re-count automatically after the counter is full 2: Count down by the number of stitches, re-count automatically after the counter is full 3: Count up by the number of stitches. After the counter is full, the motor stops automatically. Start recount by reset key setting or e P key on the panel 4: Count down by the number of stitches. After the counter is full, the motor stops automatically. Start recount by reset key setting or e P key on the panel 5: Count up by the number of stitches. When the counter is full, an alarm is issued. And the motor locks after trimming 6: Count down by the number of stitches. When the counter is full, an alarm is issued. And the motor locks after trimming.
153	1~100	1	Piece count function ratio value setting
154	1~9999	1	Piece count upper limit setting
155	0~4	0	Piece count mode selection: 0: No count 1: Count up the number of piece count and automatically re-count after the counter is full.

Parameter Number	Parameter Range	Typical Value	Parameter Description
155	0~4	0	2: Count down the number of piece count and automatically re-count after the counter is full. 3: Count up by the number of stitches. After the counter is full, the motor stops automatically. Start recount by reset key setting or e P key on the panel 4: Count down by the number of stitches. After the counter is full, the motor stops automatically. Start recount by reset key setting or e P key on the panel
156	0~9999	0	Corresponding to 1/2/3/4 solenoid chop duty cycle time selection (0 in ms, 1 in 0.1ms)
157	0~9999	0	Corresponding to 5/6/7/8 solenoid chop duty cycle time selection (0 in ms, 1 in 0.1ms)
158	0~1	0	Count adjustable switch (stitch count number and piece count number) (0 adjustable, 1 not adjustable)
161	0/1/2	2	Parameter transmission: 0: No action; 1: Down parameter; 2: Upload parameter
163	1/2	0	Save current parameters as user-defined machine repair parameters (recoverable)
164	-	0	Password
200	0/1/2	0	Trimming motor operation mode selection: 0: Flat type; 1: Stretch type (normal stretch trim: trimming at needle position); 2: Overedge: Manual trimming
201	0~359	0	Mechanical angle at the end of trimming
203	5~359	10	Trimming start angle TS (relative to lower needle angle)
204	10~359	180	Trimming end angle TE (relative to the lower needle angle, greater than TS)
20A	10~60	50	Trimming boost coefficient (motor boost)
20B	0/1	0	Encrypted Sewing Function Switch
211	5~359	30	Release electromagnet start angle LS (relative to lower position angle)
212	10~359	300	Release electromagnet end angle LE (relative to lower needle angle, greater than LS)
213	1~999	1	Release electromagnet start delay time L1(ms)
214	1~999	10	Release electromagnet delay time L2 (ms) at needle position
215	0/1	0	Sweep function selection: 0: off; 1: on
216	1~999	10	Wiping/sweep delay ms
217	1~9999	30	Wiping/sweep duration ms
219	0/1	1	Tension function selection: 0: off; 1: on
21A	10~359	120	Tension start angle
21B	11~359	320	Tension end angle
21E	11~359	120	Lowering angle after lifting the presser in stitching
220	200~360	360	Stop position after trimming (trimming pullback function)
231	0/1	0	Automatic test mode selection: (Test mode setting represented by the previous two digits) 0: e number of fixing stitches; 1: fixing time (×100ms)
232	0~1000	300	Safety switch alarm confirmation time ms (direct drive switch and stretch sewing protection switch can be processed in the same way)
234	0/1	0	Motor steering: 1: reverse; 0: forward
240	0~9999	1000	Motor/head ratio: X0.001 (If gear ratio is calculated automatically, the parameter in the controller may be different from HMI)
242	0~359	209	Upper needle stop position adjustment angle (relative to position offset of upper needle position sensor)
243	0~359	179	Lower needle stop position mechanical angle
244	0~800	50	Presser delay (ms)
247	850~1350	1030	Tail-pin encrypted magnet suction angle

Parameter Number	Parameter Range	Typical Value	Parameter Description
248	0~300	220	Release time of electromagnet
249	0~50	25	Solenoid duty ratio

Section 4 Trouble Code Table

4.1 Monitoring Parameter Table

Parameter Number	Parameter Description	Parameter Number	Parameter Description	Parameter Number	Parameter Description
010	Number of stitches	022	Phase current	027	Accumulated motor running time (Hour)
011	Number of pieces	023	Initial angle	028	Head interaction voltage sampling value
013	Hall state	024	Mechanical angle	029	DSP software version number
020	Busbar voltage	025	Pedal voltage sampling value	030-037	Historical error code
021	Head speed	026	Actual value of head drive ratio		

4.2 Safety Alarm Table

Alarm Code	Code Definition	Solutions
Warm:01	Refuel reminder	Press P key to cancel the alarm temporarily. Please refuel and perform time reset operation timely
Warm:02	Stitch count alarm	Indicate that the number of stitches has reached the upper limit. Press P key to cancel the alarm and count again
Warm:03	Piece count alarm	Indicate that the number of pieces has reached the upper limit. Press P key to cancel the alarm and count again
Warm:04	Emergency stop	Press the emergency stop key again to cancel the emergency stop state
Warm:05	Needle lifting lock	Press the needle lifting lock key again to cancel the needle lifting lock status
Warm:06	Power off reminder	Please wait for 30 seconds before turning the power back on

4.3 Error Code Table

If the system shows error or alarm, please check the following items first:

Error Code	Code Definition	Solutions
Error:01	Hardware over-current	Turn off the system power. Turn on the power again after 30 seconds. If the controller still does not work, replace the controller and inform the factory.
Error:02	Software over-current	
Error:03	System under-voltage	Disconnect the controller power and check if the input supply voltage is too low (lower than 176V). If the power supply voltage is too low, restart the controller after the voltage returns to normal. If the voltage is restored to normal but the system still does not work after starting the controller, please replace the controller and inform the factory.
Error:04	Over-voltage at shutdown	Disconnect the controller power and check if the input supply voltage is too high (above 264V). If the power supply voltage is too high, restart the controller after the voltage has returned to normal. If the voltage is restored to normal but the system still does not work after starting the controller, please replace the controller and inform the factory
Error:05	Over-voltage at operation	
Error:06	Electromagnet circuit failure	Turn off the system power and check if the solenoid wiring is correct, loose or damaged. Replace if necessary. After confirming the error, restart the system. If it still does not work, replace the controller and inform the factory.
Error:07	Current detection circuit failure	Turn off the system power. Turn on the power again after 30 seconds and observe whether it can work normally. Retry several times. If the fault occurs frequently, replace the controller and inform the factory.
Error:08	Motor stalled	Disconnect the controller power and check if the motor power input plug is loose or damaged, and if any foreign objects are wrapped around the machine head. After eliminating the issue and restarting the system. If it still does not work normally, please replace the controller and inform the factory.

Error Code	Code Definition	Solutions
Error:09	Brake circuit failure	Turn off the system power and check if the white brake resistor connector on the power board is loose or off. After plugging it in tightly, restart the system. If it still does not work, replace the controller and inform the factory.
Error:10	HMI communication failure	Check if the connection between the control panel and the controller is detached, loose or broken, it is restored to normal and the system is restarted. If it still does not work, replace the controller and inform the factory.
Error:11	Head needle stop signal failure	Check if the connection between the head synchronization signal device and the controller is loose, and restart the system after returning it to normal, but the system still does not work, replace the controller and inform the factory.
Error:12	Motor initial angle detection failure	Please try again 2-3 times after power off. If the fault is still reported, please replace the controller and inform the factory.
Error:13	Motor HALL failure	Turn off the system power and check if the motor sensor connector is loose or detached. Return it to normal and restart the system. If it still does not work, replace the controller and inform the factory.
Error:14	DSP read and write EEPROM failure	Turn off the system power. Restart the system after 30 seconds. If the system still does not work, replace the controller and notify the factory.
Error:15	Motor over-speed protection	
Error:16	Motor reversal	
Error:17	HMI read and write EEPROM failure	
Error:18	Motor overload	
Error:19	Turn over the alarm	
Error:23	Motor stalled sector error	Disconnect the power from the controller and check if the motor power input plug is detached, loose or damaged, and if any foreign objects are wrapped around the machine head. After restarting and the system still cannot work normally, please replace the controller and inform the factory.

4.3 Pedal Sensitivity Adjustment

Pedal starts moving from the initial position (p.136) where the motor stops, slowing forward to the low speed point (p.137) where the motor runs at the minimum speed (p.100), continuing to the accelerated point (p.138) where the motor starts to speed up, until the maximum speed point (p.139) where the motor runs up to the maximum speed (p.101). And when the pedal steps back to the foot lifter position (p.135), the presser foot lifts. Continuing back to the auto trimming position (p.134), the line is cut. Adjusting the corresponding parameters, user can acquire the proper pedal response to fit the personal habit.

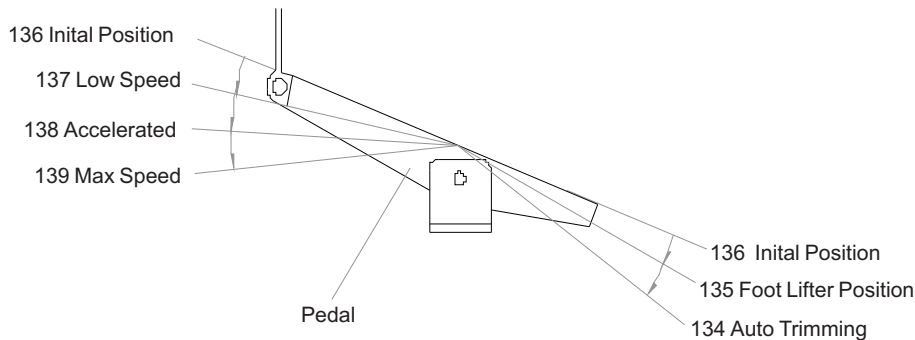


Fig. 4-1 pedal movement of each position parameter