AC 伺服马达
AC Servo motor

使用说明书 V1.3
User Manual V1.3

型　号 : WR512

使用前请详细阅读本使用说明书及所搭配的缝制机械说明书，配合正确使用，并须由接受过正确训练的人员来安装或操作。

Please read the manual carefully and the manual of sewing machinery accompanied before use. Installation and operation by trained professionals and correct use are required.

目　录

1.安全上的注意事项

使用前请详细阅读本技术资料与所搭配的缝制机械说明书，配合正确使用，并必须有接受过正确训练的人员来安装或操作。

在使用或安装 EasyDriver（“易动”）型伺服马达系列控制箱驱动装置时，请注意以下事项。本驱动装置仅适用于指定的缝制机械，请勿移做其他用途。

1.1 作业环境的安全

(1)电源电压：

电源电压请遵照马达与控制箱铭牌所标之规格 200V—240V 范围操作。

(2)电磁波干扰：

请远离高频磁波机器或电波发射器等，以免所产生的电磁波干扰本驱动装置因而发生错误动作。

(3)温湿度：

a.请不要在室温 45℃以上或 5℃以下的场所操作。

b.请不要在日光直接照射的场所或室外运作。

c.请不要在暖气(电热器)旁运作。

d.请不要在相对湿度 30％以下或 95%以上或露水的场所运作。

(4)空气：

a.请不要在多灰尘或具有腐蚀性物质的场所操作。

b.请不要在有挥发性气体的场所操作。

1.2 安装的安全

(1)马达、控制箱：请遵照说明书正确装好。

(2)附属品：如要装配其它选购配件或附属品时，请先关闭电源并拔掉电源线插头。

(3)电源线：

a.请注意不要被外物压住或过度扭曲电源线。

b.装钉电源线时请不要靠近会转动的上轮，最少要离开 3 公分以上。

c.当连接电源线到电源插座时，应确定比供应电压必须符合标示在马达与控制箱铭牌上的指定电压 200V—240V 内。

(4)接地：

a.为防止杂讯干扰或漏电事故，请做好接地工程（包括缝纫机、马达、控制箱、定位器）。

b.电源线的接地线须以适当大小的导线和接头连接到生产工厂的系统地线，此连接必须被永久固定。

1.3 操作中的安全

(1)在第一次开电后，请先以低速操作缝纫机并检查转动方向是否正确。

(2)缝纫机运转时，请不要去触摸上轮、机针等会运动的部位。

(3)所有可运动的部分，必须以所提供的防护装置加以隔离，防止身体接触并请勿在装置内塞入其他物品。

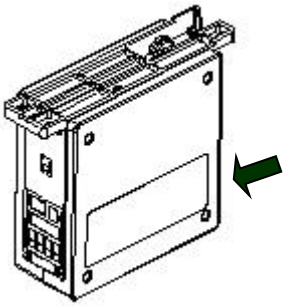
(4)请不要在拆下皮带护盖及其他安全装置下操作。

1.4 保养维修

在操作以下动作前，请先关闭掉电源：

(1)要拆卸马达或控制箱时，或在控制箱上插或拔任何连接插头时。

(2)控制箱里面有危险高压电，所以关闭电源后要等 1 分钟以上方可打开控制箱盖。



内部高压电危险

(3)翻抬车头时，与更换车针或梭子或穿线时。

(4)修理或作任何机械的调整时。

(5)机器休息不用时。

1.5 保养维修的规定

(1)修理及保养的作业，要请经过训练的技术人员执行。

(2)马达的通风口附近，请不要堆置杂物阻塞空气流通，尤其马达后风盖上更不可附著灰尘、纸屑、布屑等物，以免造成马达发烫。

(3)请不要用以下物体，如木槌、铁槌…等敲击本产品装置或马达（马达）心轴。

(4)所有维修用的零件，须由本公司提供或认可，方可使用。

1.6 危险标示、注意标示

这个标示符号表示机器安装时，如有错误恐会伤害到人体或机器会受到损坏，所以机器方面有危险性的地方会有此标志。

这个标志符号表示有高压电等，电气方面有危险性的地方会有此标志。

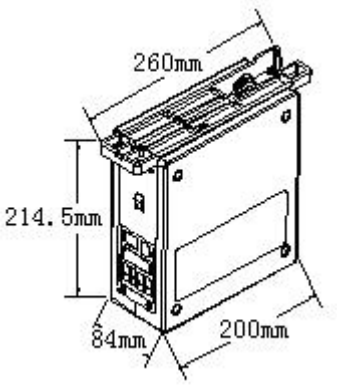
1.7 保质期限规定

本装置保证在正常工作情况且无人为失误的操作下，保证自出厂 12 个月内，无偿的为客户维修使能正常操作。

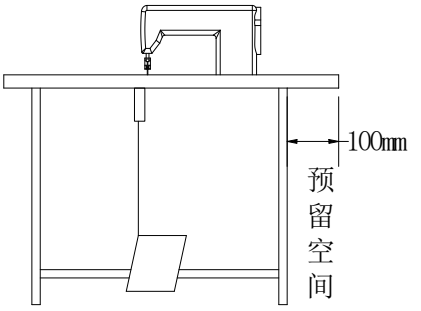
2.安装与调整

2.1 驱动器板的安装

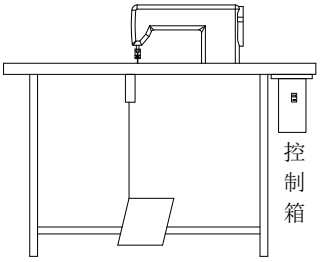
（a）控制箱尺寸图



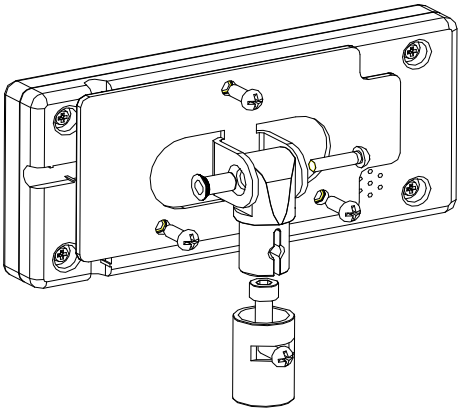
（b）缝纫机桌板右侧必须预留 100mm 以上空间



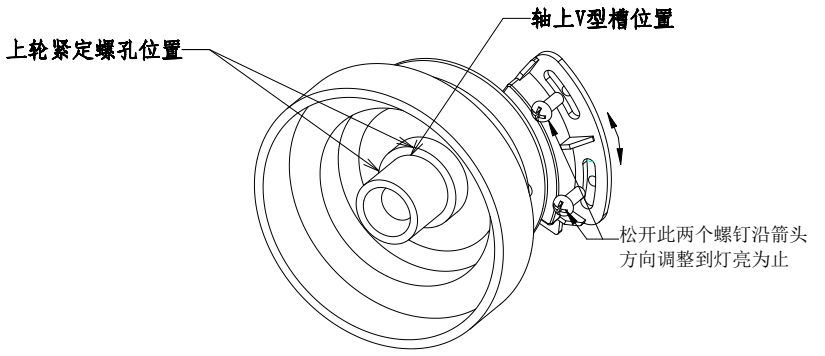
（c）控制箱安装后示意图



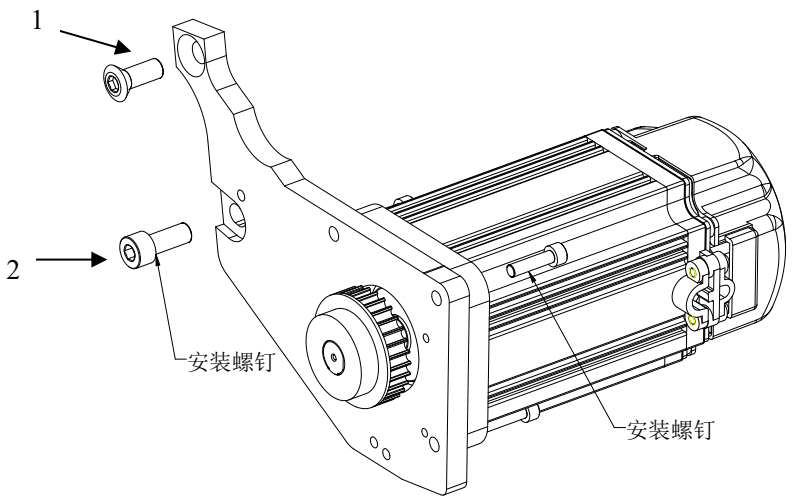
2.2 操作盒的安装



2.3 停针传感器的安装与调整

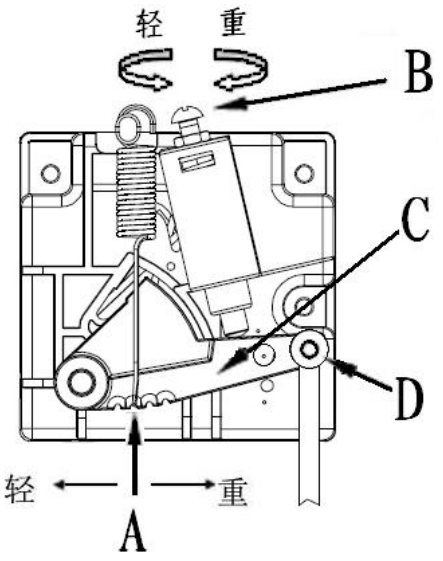


2.4 电机的安装与调整



通过对安装螺钉 1、2 的调整，可以调节皮带的松紧度。

2.5 踏板的调整



踏板各部位名称：如左图所示

A、运行弹簧

B、后踏力量调整螺栓

C、踏板摇杆

D、球接连杆

表 2.1

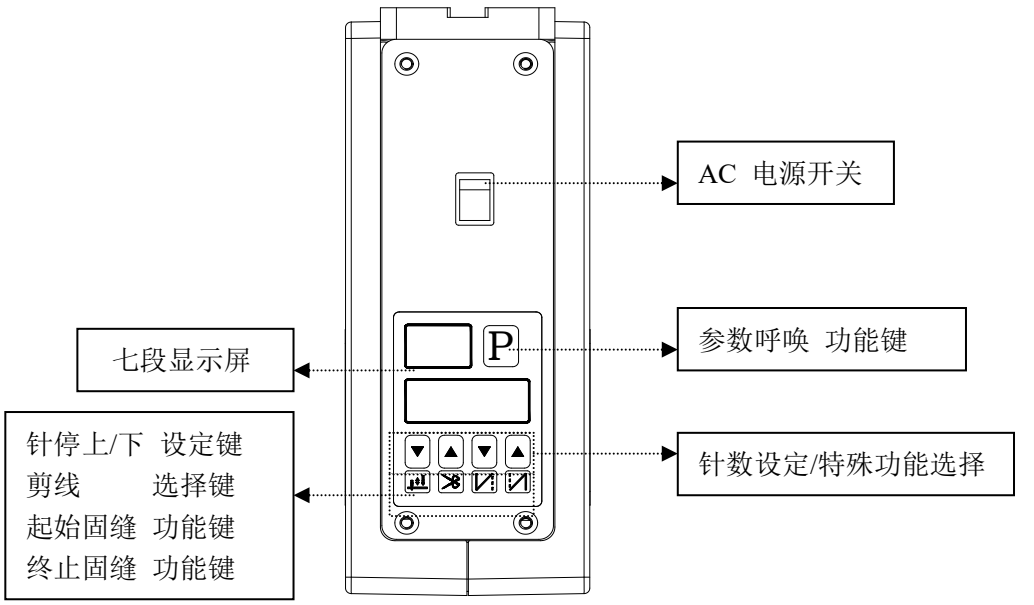
序号	调整需求	调整效果
1	踏板前踏力量调整	弹簧 A 向右侧勾时，前踏力量加重 弹簧 A 向左侧勾时，前踏力量减轻
2	踏板后踏力量调整	逆时针向上拧动螺栓，后踏力量减轻 顺时针向下拧动螺栓，后踏力量加重
3	踏板行程长短调整	球接连杆 D 选择右侧孔时，为长行程模式 球接连杆 D 选择左侧孔时，为短行程模式

3.接线与接地

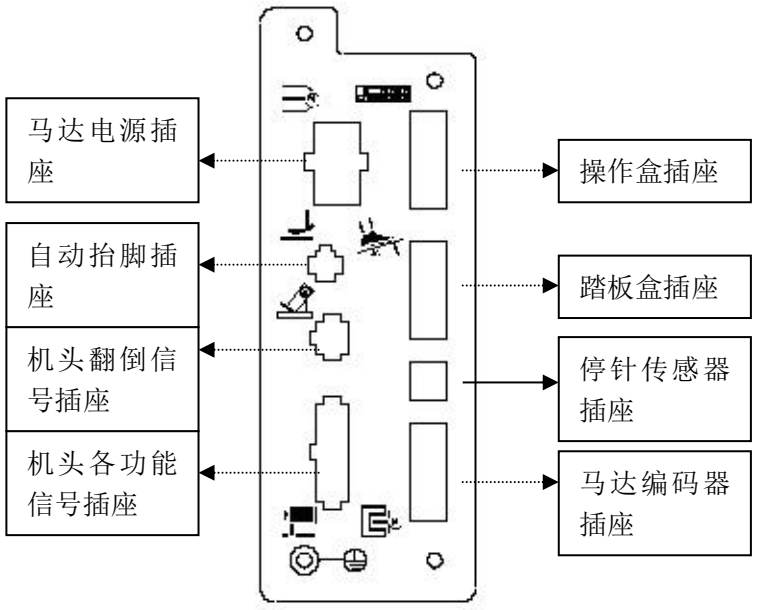
一定要做好系统的接地工程，请合格的电气工程人员予以施工。

4. 机箱各部位的名称

4. 1 机箱正面



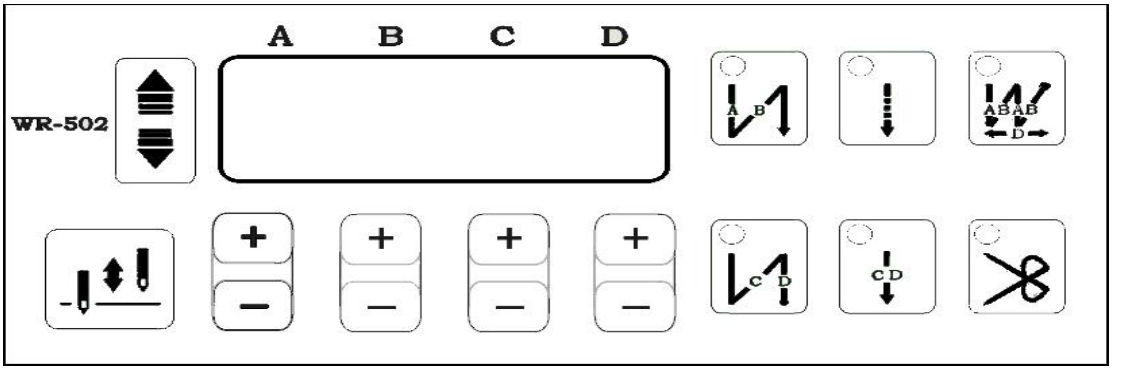
4.2 机箱背面：端子座面板

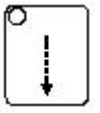


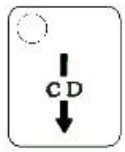
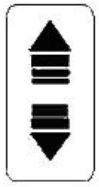
按端子座面板的指示插接各连接线，DB 插头要插牢后锁紧，其余的插头插紧后确定其锁扣已扣牢。

5. 操作盒使用说明

5.1 操作盒的使用说明



功　　能	按 键	描　　述
起始固缝功能选择		执行起始固缝来回 1 或 2 次
终止固缝功能选择		执行终止固缝来回 1 或 2 次
自由缝		踏板往前踩，可正常缝纫，中间位置停机，往后踩，完成剪线等功能

连续固缝		1、 往前踩踏板，自动执行来回缝纫动作，来回次数 D 段设定，最高可达 15 次。 2、 连续固缝模式系统默认为触发模式，无需踏板一直踩下。 3、 该功能有效时，起始终止固缝设定无效。
定长缝		1、 往前踩踏板，执行 CD 设定的缝纫针数。 2、 每段缝纫过程中，抬起踏板，缝纫立即停止，继续踩踏板，则开始执行各段设定未完的针数。 一段针数缝纫完毕，自动执行终止固缝（如果选择）剪线等动作。
提针/补针		1、 自由缝模式，可根据所按时间长短的不同，可以补半针、一针和连续补针。 2、 定长缝，每段缝纫未结束中间停车，按此键作提针用，即停在上针位上。
剪线选择		设定或取消剪线功能。
调速键		增调速键。连续按下，缝纫速度升高，显示屏自动切换为速度设定值。自由缝有效。 减调速键。连续按下，缝纫速度降低，显示屏自动切换为速度设定值。自由缝有效。

5.2 注意事项

a、 上电，系统完成自检，所有的 LED 灯被点亮，显示屏显示“8888”字样，蜂鸣器会发出鸣叫，上述过程维持 0.5 秒左右时间然后恢复到上次掉电前界面。

b、 操作盒上的按键有效，与之对应的指示灯则亮，表明选中该缝纫功能，每按一次，蜂鸣器会发出“哔”一声短叫。比如一个完整的缝纫功能需要有：起始固缝来回一次，自由缝及终止固缝来回一次，只要选中相应的图标即可，若要取消前终止固缝，只要再按相应的图标即可取消。

c、 当仅需要单固缝时，可将 A、D 段针数设为 0 即可。

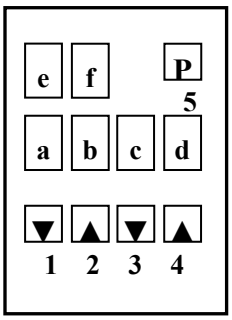
d、 选中连续固缝  ，起始终止固缝设定无效。

e、 起始终止固缝针数设定为自由缝和定长一段缝所共用，但只能在自由缝状态下查看和更改针数。

f、 当操作盒读写参数时出错，显示屏会提示“Erro”，其他故障均由机箱小操作面板提示，出现这种情况请寻求技术支持。

6.机箱操作面板使用说明

机箱操作面板布局如图所示，包括六个数码管 abcdef 和五个按键 12345。



6.1 缝纫功能设定

机箱 HMI 的默认设定模式，通过按键 1234 和数码管 abcd 可以分别设定针位、剪线、起始固缝、终止固缝选择。

1：针位选择　　a：**0** 上针位；**1** 下针位

2：剪线选择　　b：**0** 不剪线；**1** 剪线

3：前固缝选择　c：**0** 无；**1**　AB 双固缝；**2**　ABAB 四固缝

4：后固缝选择　d：**0** 无；**1**　CD 双固缝；**2**　CDCD 四固缝

对于不同的工作模式及缝纫模式下，这四个设定不一定都有效。

1) 系统带机头操作盒工作。仅针位选择有效，其他通过机头操作盒设定。

2) 系统不带机头操作盒工作。

a)自由缝、定长缝：四个设定均有效。b)连续固缝（W 缝）：仅剪线设定有效。c)简易缝纫：四个设定均无效。

3) 自动测试模式：四个设定均有效。

按下 P 键同时上电，系统进入自动测试模式，此时机头操作盒设定无效，只可通过机箱 HMI 进行自动测试的相关设定。按 P 键后同时按下键 4 启动、停止。

关于数码管 ef 的显示功能：

1） 数码管 e：显示翻抬开关的状态。翻抬开关无效时不显示，翻抬开关有效时显示动画，表示机头已抬起，此时系统禁止运行。

2） 数码管 f：区分不同的缝纫模式。

简易缝纫时显示“E”，自动测试时显示“A”，其他模式无显示。

6.2 功能参数设定

在缝纫功能设定模式即机箱操作面板的默认模式下，长按 P 键进入功能参数设定状态。数码管 abcd 显示参数值，通过按键 34 修改；数码管 ef 显示参数编号，通过按键 12 修改，同时保存上一参数的值。按 P 键退出参数设定模式，并保存当前参数值。

按键 1234 短按每次变更，长按可连续快速增减。

注：系统运行时无法进入参数设定模式；进入参数设定模式除非退出否则系统无法运行。具体参数见双针机系统参数表。

6.3 系统监控状态

机箱操作面板默认模式下，按 P 键后同时按下键 1 进入系统监控状态。数码管 abcd 显示监控值；数码管 ef 显示监控参数编号，通过按键 12 修改。

ef	1	2	3	4
abcd	速度	电流	电压	线迹
单位	spm	A	V	Stitch

6.4.系统故障状态

当系统检测到有故障时，系统停止运转，同时机箱操作面板显示故障代码。数码管 abcd 显示故障编号。具体的故障见故障代码列表。

7.系统参数表

NO.	项目	内容	设定范围	默认值
1	缝纫最高速	踏板最高速度	300~3000(spm)	3000
2	缝纫最低速	踏板最低速度	100~800(spm)	200
3	踏板曲线调整	踏板曲线调整	1~100	60
4	起始固缝速度	前加固缝速度	300~1200(spm)	700
5	终止固缝速度	后加固缝速度	300~1200(spm)	700
6	连续固缝速度	连续加固缝速度	300~1200(spm)	700
*7	剪线速度	剪线速度	100~300(spm)	200
8	加固缝选择	选择加固缝模式，0：装饰性固缝；1：保留	0/1	0
9	装饰性固缝停针位	P8=0 时，停针位选择，0：上针位；1：下针位	0/1	1
10	装饰性固缝停留时间	P8=0 时，中间停留时间	10~1000(ms)	150
11	加固缝次数	设定双加固或四固缝，0：双加固，1：四加固	0/1	0
12	软起动功能	始缝时是否进行软起动，0：无，1：有	0/1	0
13	软起动针数	始缝时进行软起动的针数	1~9(针)	2
14	软起动速度	始缝时进行软起动的速度	100~1000(spm)	800
15	缝纫模式	缝纫模式设定 0：自由缝 1：连续固缝（W 缝纫） 2：定长一段缝 3：简易缝纫	0~3	0
16	起始固缝针数 A	起始固缝顺缝针数（不带机头 HMI 时有效）	0~32(针)	3
17	起始固缝针数 B	起始固缝倒缝针数（不带机头 HMI 时有效）	1~32(针)	3
18	终止固缝针数 C	终止固缝倒缝针数（不带机头 HMI 时有效）	1~32(针)	3
19	终止固缝针数 D	终止固缝顺缝针数（不带机头 HMI 时有效）	0~32(针)	3
20	定长一段缝针数	定长缝一段缝针数（不带机头 HMI 时有效）	1~99 (针)	10
21	连续固缝重复次数	连续固缝来回次数（不带机头 HMI 时有效）	1~99(次)	5
22	抬压脚控制模式	抬压脚功能模式设定 0：无抬压脚功能 1：踏板抬压脚功能（踏板在剪线位置也默认） 2：踏板+剪线后自动抬压脚 3：踏板＋中间停＋加剪线后自动抬压脚	0~3	2
23	上电定位	上电时机头自动运转至上针位功能设定 0：无上电定位功能 1：有上电定位功能	0/1	1
24	翻抬开关信号模式	机头翻抬开关信号模式设定 0：常开信号　　1：常闭信号	0/1	0

26	梭心线控制	梭心线监控设定 0：无效 1：有效	0/1	0
27	线迹计数设定	梭心监控预报警目标计数值	0~250(×200)	5
30	抬压脚延迟缝纫时间	为确认压脚已放下的延时	0~800(ms)	200
31	抬压脚全压输出时间	抬压脚全压输出时间	0~800(ms)	150
32	抬压脚输出占空比	抬压脚输出占空比	0~100	15
33	抬压脚保护时间	抬压脚强制关断保护时间	1~60(s)	12
34	倒缝全压输出时间	倒缝全压输出时间	0~800(ms)	150
35	倒缝输出占空比	倒缝输出占空比	0~100	35
36	倒缝保护时间	倒缝强制关断保护时间	1~60(s)	12
41	连续固缝补偿 1	连续固缝针迹补偿参数	0~72	18
42	连续固缝补偿 2	连续固缝针迹补偿参数	0~72	18
43	特殊功能参数	P43=5，显示停留时间超过 2 秒，恢复出厂参数 P1~P42	0~15	0

*带标记的项目是维修用的功能，如果更改了出厂时的初始设定，有可能出现损坏机器或使机器性能降低的危险。要更改时，需专业人员指导。但有时为了提高缝纫机的功能和性能，有可能随时变更功能设定值。

8.部分参数说明

P1：缝纫最高速。

设定范围“300~MAX”，其中 MAX 指的是高级参数 P53。缺省值单针机 3000spm，双针机 2000spm。

P1~P3：踏板行程与速度关系。

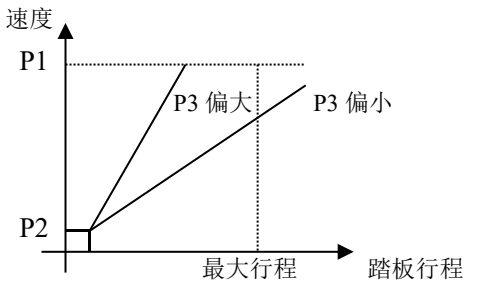


图 1　踏板行程与速度关系曲线

从上图可看出，若 P3 曲线斜率太小，有可能达不到 P1 设定的缝纫最高速。

P8：加固缝选择。

装饰性加固缝：来回加固过程中有停顿，可确保针迹一致性。停顿时间由 P10 决定。

标准性加固缝：来回加固过程中没有停顿，固缝过程一次走完。

P12~P14：软启动相关参数。

当起始缝纫速度过高时，面线和底线可能结不起来，通过限制缝纫机的始缝速度可以提高缝纫的可靠性。

注：当设定起始固缝有效时，软启动功能无效。

P15：缝纫模式

P15=0,1,2 时，只有无机头操作盒时，设定才有效。

P15=3 时，缝纫模式为简易缝纫模式，无论有无机头操作盒。

简易缝纫一般使用场合为：当机头传感器损坏，系统提示 E011 故障时使用。

1） 简易缝纫时，该缝纫机可做普通电车用，无剪线和自动倒顺缝功能；

2） 机针可停在任意点位置，踏板往后踩，均默认为抬压脚功能。

3） 自动找上针位功能和计针数功能均失效。

P16~P21：缝纫针数相关参数。

注：当无机头操作盒时，可通过机箱小操作面板设定这些参数，相应参数激活有效。有机头操作盒时，以机头操作盒设定为准。

P22：抬压脚控制模式。

缺省踏板抬压脚有效。若是该缝纫机无抬压脚提升装置，建议该功能码设为 0，否则始缝时启动会变慢。

另外需注意的是：当 P22 设为 2 或 3 时，踏板信号可终止剪线后自动抬压脚的状态，即踏板回到零位（脚不放在踏板上，踏板自然状态）抬压脚也随之放下，若想继续抬起压脚，可将踏板往后踩即可。

P23：上电定位功能。

初次上电系统会自动运转到上停针位置。如果缝纫机手轮已在上针位有效位置范围内，则系统不会运转。

P26：梭心线控制。

若设定有效，针数到达 P27 预先设定的针数，机头操作盒会蜂鸣提示，LED 会闪烁，但不影响缝纫，如果继续往前缝纫，LED 会常亮，直至剪完一次线以后，LED 熄灭，内部计数器清零，走过的线迹数也可以通过监控参数 4 来查看。

P41~P42：针对连续固缝模式针迹调整参数。

针迹补偿原则：该缝纫机倒顺针针脚相差不大，倒缝机构一致性要好。

调整方法：请将倒顺缝设为相同针数，并按下述方法调整两个参数。

连续固缝针迹补偿（参数 No.41~42）

顺缝倒缝接合部：

若顺缝针数变少或最后一针变短，则调小参数 No.41。

若倒缝针数变少或第一针变短，则调大参数 No.41。

倒缝顺缝接合部：

若倒缝针数变少或最后一针变短，则调小参数 No.42。

若正缝针数变少或第一针变短，则调大参数 No.42。

P44~P53：高级参数设定。

P43＝11，可进入高级参数设定。主要是用来调整机器位置及老化机器设定一些参数。此外可设定该台缝纫机的最高转速。

P45：缝纫机机针下针位位置。

该下针位位置是以上停针位作为零度开始计。若选择装饰性固缝，发现针迹有错位现象，可微调 P45 参数校正，同时注意上停针安装的位置偏差会影响到下停针位置点，安装上停针传感器时注意安装的一致性。

P50：自动测试速度。

单针机设定范围：300～3000spm，默认 2500spm。

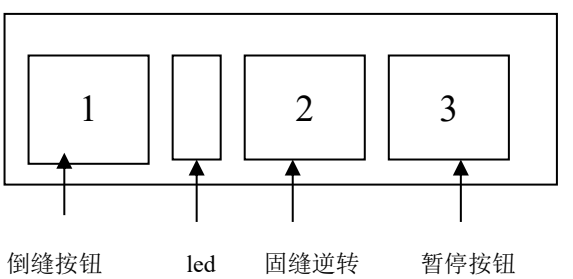
双针机设定范围：300～2500spm，默认 1800spm。

P53：厂家设定最高缝纫速度。

单针机设定范围：300～3500spm，默认 3000spm。

双针机设定范围：300～2500spm，默认 2000spm。

附：机头按钮示意图：



9.故障代码表

故障显示	故障内容	检查项目、处理
E011 E012 E013 E014	同步器信号故障 电机信号故障	同步器插头是否接触良好 电机插头是否接触良好 电机信号检测器件是否损坏
E021 E022 E023 E201	电机超负荷	电机插头是否接触良好 机头或剪线机构是否卡死 是否缝制规格厚度以上布料
E101	硬件驱动故障	请寻求技术支持
E111 E112 E113	系统电压过高	系统进线电压是否过高
E121 E122	系统电压过低	系统进线电压是否过低
E131	系统检测回路故障	请寻求技术支持
E141	系统数据读写故障	请寻求技术支持
E151 E152	电磁铁故障	机头电磁铁是否短路
E211 E212	电机运转非正常	电机插头是否接触良好 电机信号是否不匹配
E301	操作盒通讯不良	操作盒插头是否接触良好 操作盒器件是否损坏
P.oFF	掉电显示	等待电源重新开通

注：若以上故障按检查项目不能排除，请寻求技术支持。

Contents

1. Notes on safety

Please read carefully User's Guide and the manual of sewing machinery accompanied before use. Installation and operation by trained professionals and correct use are required.

Read carefully the following instructions for proper use. EasyDriver servomotor series can only be used for designated sewing machinery, with no exception.

1.1 Operating Environment Security

(1) Power Supply:

Please follow the 200V—240V indicated on the nameplates of motor and control box.

(2) Electromagnetic wave interference:

Keep away from high frequency electromagnetic wave machines or electric wave emitter so as to avoid interference.

(3) Humidity and temperature:

a. Working environment: 5℃~ 45℃, room temperature

b. Keep away from sun light, indoor use only.

c. Keep away from (electric) heating appliances

d. Relative humidity: 30％~95%, keep away from dew.

(4) Air:

a. Keep away from dusty or corrosive environment.

b. Keep away from volatile substance.

1.2 Installation Security

(1) Motor, control box: follow the steps indicated in the manual

(2) Accessories: power off and unplug power cord before installing any optional accessories.

(3) Power cord:

a. Avoid pressure or over distortion.

b. Keep the power cord at least 3 cm away from upper roller.

c. Make sure that supply voltage is between 200V—240V.

(4) Earthing:

a. Handle earthing (including sewing machine, motor, control box, locator) correctly to avoid interference or creepage.

b. The earthing cord of power cord must be connected to user's system earthing cord with proper conducting wire and joint and fixed permanently.

1.3 Operation Security

(1) Operate at low speed to check if rotation direction is correct when the sewing machine is powered on for the first time.

(2) Do not touch the upper roller or needles when the sewing machine is running.

(3) All movable components must be isolated by protection apparatus provided to avoid unnecessary contact and nothing shall be put inside the machine.

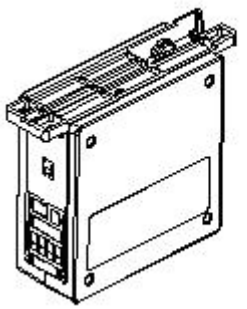
(4) No operation is allowed in the absence of belt guard and other security apparatus

1.4 Maintenance

Turn off power before conducting the following operations:

(1) Removing motor or control box, or plugging of unplugging any plugs from the control box.

(2) There is hazardous high voltage inside the control box. Do not open the control box until the power has been off for at least 1 minute.



HAZARDOUS
VOLTAGE INSIDE

(3) Moving machine head, replacing needles or shuttle or threading.

(4) Repairing or any mechanical adjustment.

(5) The machine is not running.

1.5 Regulations on Maintenance

(1) Repair and maintenance can only be performed by trained technicians.

(2) No irrelevant articles should be put near the motor's air vent, the back vent head, in particular, shall be kept free of dust, waster paper, broken fabric, etc to avoid overheating of the motor.

(3) Do not hammer this machine or motor (motor) spindle.

1.6 Warning Signs & Notices

Used where potential dangers exist.

Used where high voltage and electric danger exist.

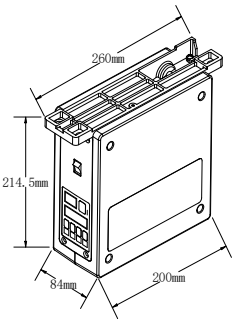
1.7 Regulations on Warranty period

Free repair service up to 12 months since leaving factory on condition that this machine is operated correctly and no human error occurs to it.

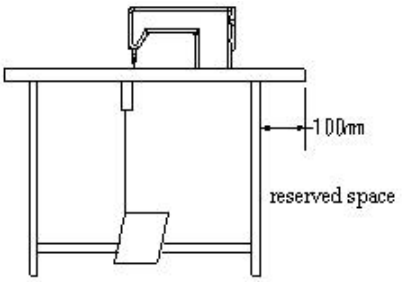
2. Installation and Adjustment

2.1 Installation of Drive Board

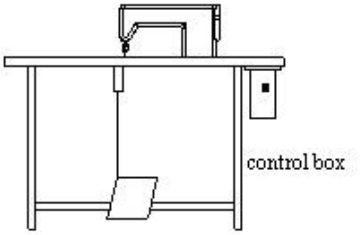
(a) Dimensions of control box



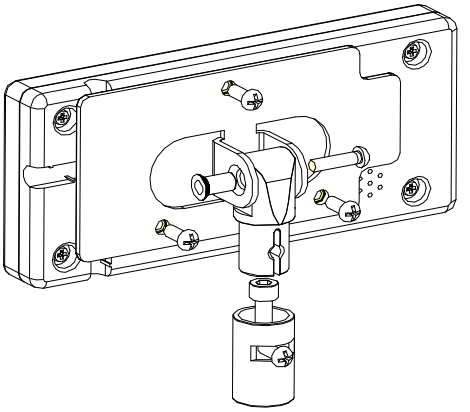
(b) At least 100mm shall be reserved for the right side of the sewing machine table.



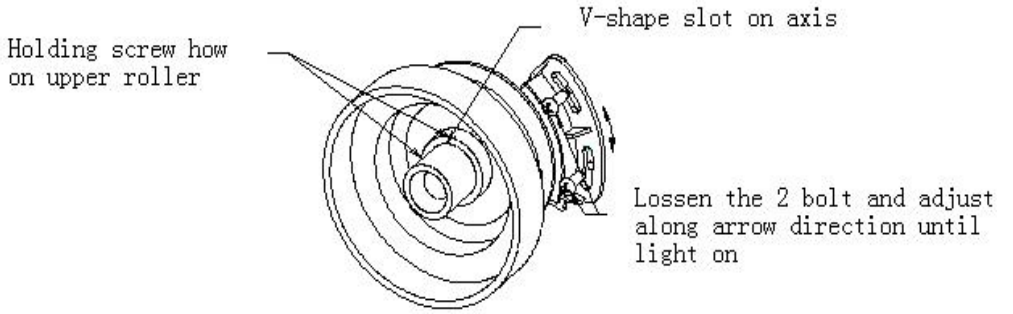
(c) After installation



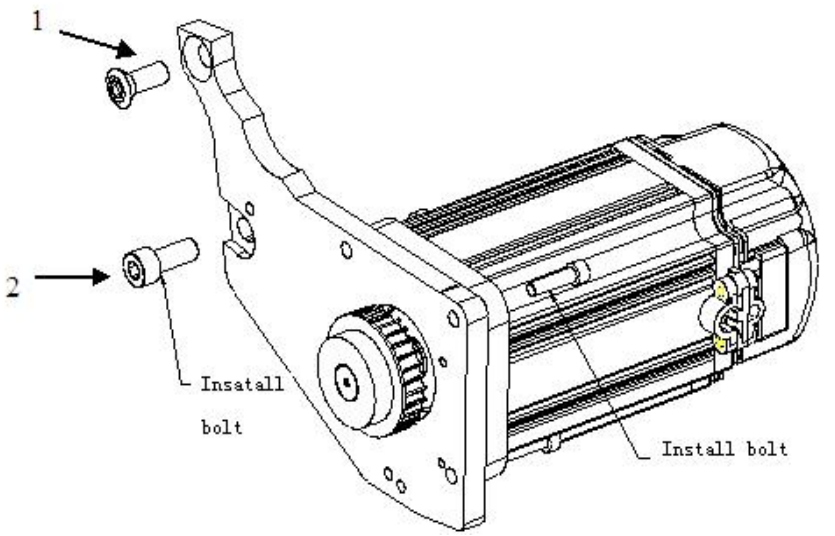
2.2 Installation of operation box (human-machine interface)



2.3 Handwheel Installation and Adjustment



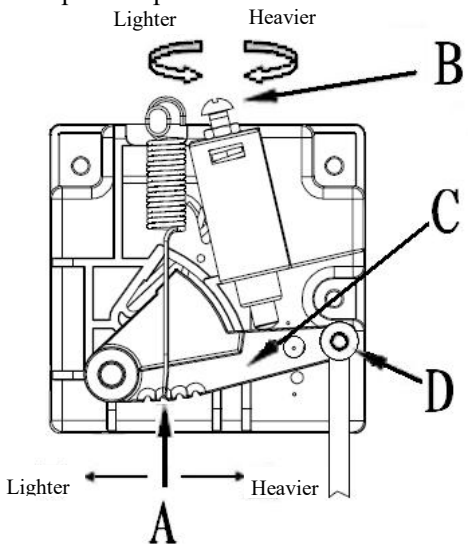
2.4 Installation and debugging of motor



Adjust bolt 1 and 2 to adjust belt tightness

2.5 Adjustment of pedal

The parts of pedal are as shown in the left figure.



A. Operation spring

B. Bolt for heeling force adjustment

C. Pedal lever

D. Ball joint link

Table 2.1

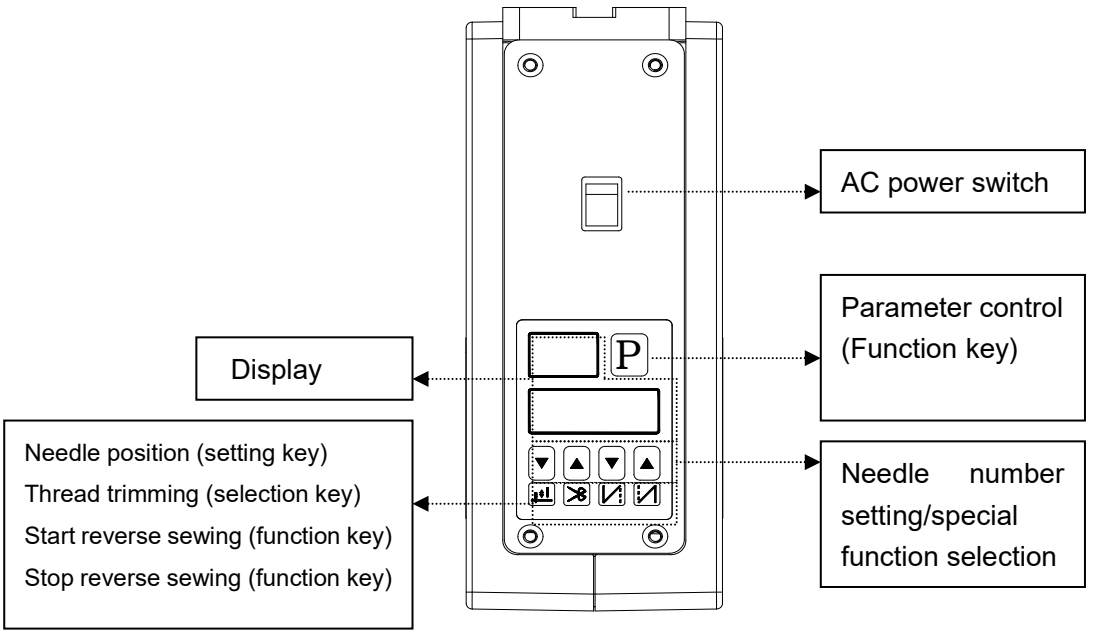
No.	Adjustment	Result
1	Adjustment of toeing force	Move spring A to the right to increase the toeing force. Move spring A to the left to reduce the toeing force.
2	Adjustment of heeling force	CCW turn the bolt to reduce the heeling force. CW turn the bolt to increase the heeling force.
3	Adjustment of pedal stroke	Secure the ball joint link D to the right hole to increase the pedal stroke. Secure the ball joint link D to the left hole to reduce the pedal stroke.

3. Connection & Earthing

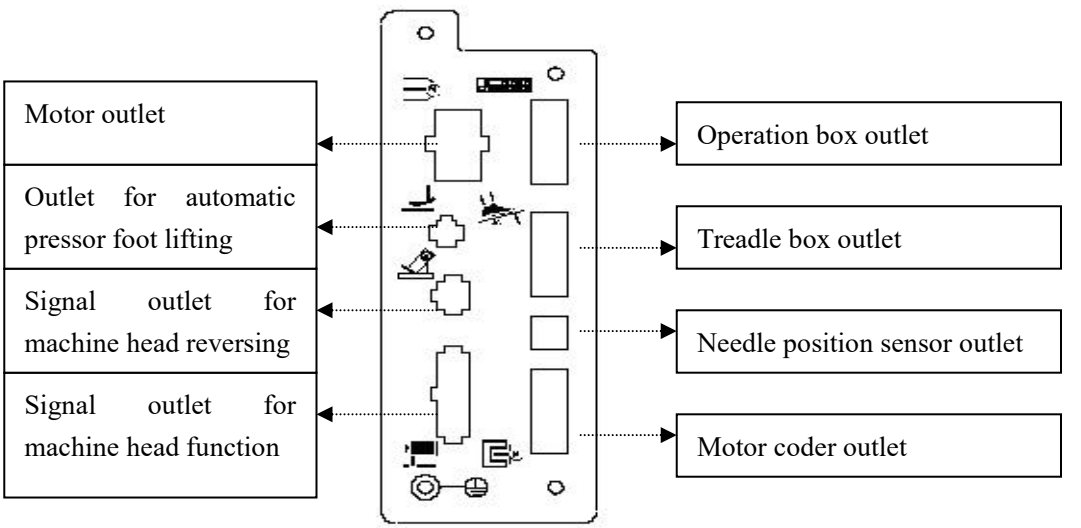
Qualified electric engineering professionals must be invited for system earthing.

4. Names of Chassis Components

4.1 Front Side



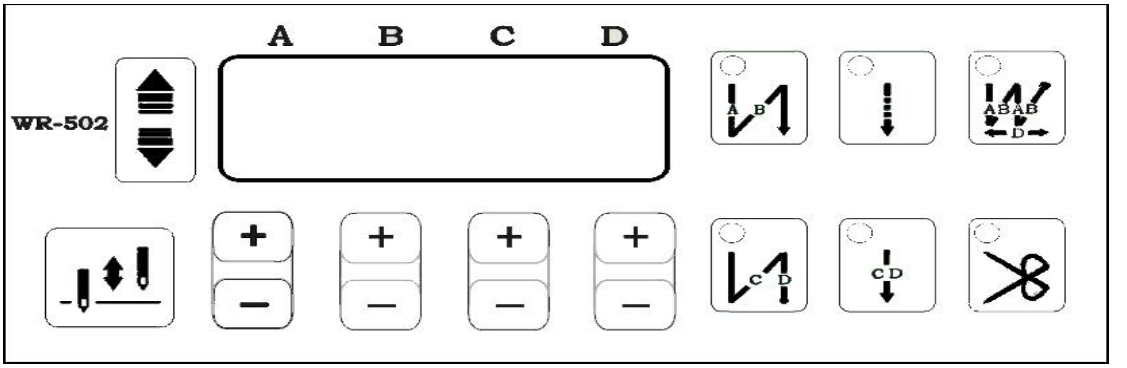
4.2 Back Side: connector

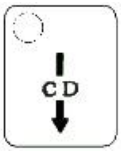


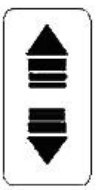
Plug wires in accordance with connector requirements; make sure that all plugs, DB in particular, have been fastened correctly.

5. Instructions for Operation Box

5.1 Instructions for Operation Box



Functions	Keys	Description
Starting Reinforcing-sewing		execute starting reinforcing-sewing 1 or 2 times，to and fro
Ending Reinforcing-sewing		Execute ending reinforcing-sewing 1 or 2 times，to and for
Free-style sewing		Press treadle ahead for normal sewing，stop in the middle,behind for thread-cuting and thread wiping
Continuous Reinforcing-sewing		1、Press treadle ahead for automatic sewing，to and for，which is set at D and can reach 15 times. 2、Continuous reinforcing-sewing is in trigger mode by default ，treadle doesn't need to be kept Being pressed. 3、previous ending reinforcing-sewing setting is invalid if this function is valid
Presrt sewing		1、Press treadle ahead to execute sewing times set at CD. 2、Sewing will stop immediately if treadle is lifted;press treadle again ,it will go on with the rest. Ending reinforcing-sewing (if selected),thread-cutting will be automatically executed after sewing is completed.

Needle-lifting/stitch compensation		1、Free-style sewing mode:Half needle,one needle and continuous compensation as required. 2、 Fixed-length sewing,stop the machine in the middle of sewing,press the key for needle-lifting,i.e.stopping at upper needle position.
Thread-cutting selection		Set or cancel thread-cutting function.
Speed key		Speed down.Keeping pressing to lower speed,the display will automatically switch to spdde set..Free-style sewing valid.
		Speed up..Keeping pressing to increase speed,the display will automatically switch to spdde set..Free-style sewing valid.

5.2 Notices

A. when the machine is powered on the system will perform self test and all LED lights turn on, “8888” will be displayed on the screen, buzzer sounds, the whole process will last around 500 milliseconds before returning to normal interface.

B. keys on operation box become valid, related lights turn on, indicating that the function is selected, the buzzer sounds for each pressing. A complete sewing function includes: starting reinforcing-sewing once, to and fro, free-style sewing and ending reinforcing-sewing once, to and fro. All needed is to press corresponding icon. Press the icon again to cancel a selected function.

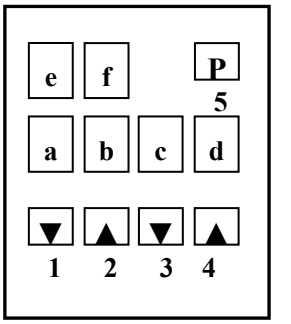
C. set needle numbers at A, D sections to 0 for signal reinforcing-sewing.

D. The selection of continuous reinforcing-sewing  makes previous ending reinforcing-sewing invalid.

E. Set the needle number of starting and ending reinforcing-sewing to be shared by free-style sewing and fixed-length sewing,but the needle number can only by viewed and modified under free-style sewing status.

F. “Erro**”** will bi displayed if parameter-reading by operation box goes wroing,other Errors will bi notified by operation box of the chassis,seek technical support if that occurs.

6. Instructions for the Operation Panel of the Chassis



Layout of the operation box of chassis, 6 digital tubes (abcdef) and 5 keys (12345)

6.1 Setting of Sewing Functions

Press key 1234 and digital tube abcd to set needle position, thread-cutting, starting reinforcing-sewing, ending reinforcing-sewing respectively.

(1) Needle position a: **0** upper needle position; **1** lower needle position

(2) thread-cuttings b: **0** unavailable; **1** available

(3) Starting reinforcing-sewing c: **0** unavailable; **1** AB double reinforcing-sewing; **2** ABAB quadruple reinforcing-sewing

(4) Ending reinforcing-sewingd: **0** unavailable; **1** CD double reinforcing-sewing; **2** CDCD quadruple reinforcing-sewing

The four settings are not necessarily valid for different working mode and sewing mode.

(1) System runs with operation box of the machine head. Only needle position option is valid, others need to be set through the operation box of the machine head.

(2) System runs without operation box of the machine head.

A. the 4 settings for free-style sewing, preset sewing are all valid.

B. only thread-cutting setting is valid for continuous reinforcing-sewing.

C. none of the 4 settings are all valid for plain sewing.

(3) Automatic test mode: all 4 settings are valid.

The system will enter automatic test mode if key P and power button are pressed at the same time, and the settings for operation box of the machine head aren't valid, the settings related to automatic test can only be done through the operation box of chassis. Press key P and 4 to switch automatic running.

Display functions of digital tube ef:

(1) Digital tube e: indicate the status of turn/lift switch

No display for invalid turn/lift switch, animated pictures for valid turn/lift switch, which means that machine head has been lifted and system running is forbidden.

(2) Digital tube f: distinguish different sewing modes

"E" for plain sewing, "A" for automatic test, no display for other modes

6.2 Setting of Parameters

Under setting mode for sewing functions, i.e. default mode of the operation box of chassis, keep pressing key P to enter setting mode for parameters. Digital tube abcd display parameter values which can be modified by pressing key 34; digital tube ef display parameter numbers which can be modified by pressing key 12, and previous parameters will be saved at the same time. Press key P to exit setting mode for parameters, and the current parameter values will be saved.

Press key 1234 short for change each time, long to keep increasing or decreasing rapidly.

Note: the setting mode for parameters can not be entered into when the system is running; exit to enter setting mode for parameters.

See the parameter list of locksmith sewing machine for details.

6.3 System monitoring status

Under the default mode of the HMI of chassis, press key P and key 1 at the same time to enter system monitoring status. Digital tubes abcd display monitoring values; digital tubes ef display monitoring parameter number, press key 12 for modification.

ef	1	2	3	4
abcd	speed	current	voltage	stitch
unit	spm	A	V	Stitch

6.4 Status of System Error

System will stop when an error is detected and error code will be displayed by the operation panel of chassis. Digital tube abcd display error number. See error code list for details.

7. Parameter list of lockstitch sewing machine

No.	Items	Contents	Settings range	Default
1	highest speed of free-style sewing	set the highest speed for machine head	300~MAX(spm)	3000
2	Min sewing speed	Lowest treadle speed	100~800(spm)	200
3	Treadle curve adjustment	Treadle curve adjustment	1~100	60
4	Starting reinforcing-sewing speed	Front reinforcing-sewing speed	300~1200(spm)	700
5	Ending reinforcing-sewing speed	Back reinforcing-sewing speed	300~1200(spm)	700
6	Continuous reinforcing-sewing speed	Continuous reinforcing-sewing speed	300~1200(spm)	700
*7	Thread-cutting speed	Thread-cutting speed	100~300(spm)	200
8	Reinforcing-sewing selection	Select reinforcing-sewing mode, 0:decorative reinforcing-sewing;	0	0
9	Decorative reinforcing-sewing needle position	When P8=0,needle position selection, 0:upper needle position； 1：lower needle position	0/1	1
10	Decorative reinforcing-sewing staying time	When P8=0,middle staying time	10~1000(ms)	150
11	Reinforcing-sewing number	Set double-reinforcing or quadruple reinforcing-sewing,0:double-reinforcing,1:quadruple reinforcing-sewing	0/1	0
12	Soft start	Whether use for starting sewing,0:unavailable,1:available	0/1	0
13	Soft start needle number	Soft start needle number for starting sewing	1~9(needles)	2
14	Soft start speed	Soft start speed for starting sewign	100~1000(spm)	800
15	Sewing mode	Sewing mode setting(valid in the absence of operation box of the machine head) 0:free-style sewing 1:continuous reinforcing-sewing(W sewing) 2:fixed-length sewing 3:olain sewing	0~3	0

16	Starting reinforcing-sewing needle number A	Needle number of starting reinforcing-sewing and obverse sewing(effective when machine head HMI is not used)	1~32(needles)	3
17	Starting reinforcing-sewing needle number B	Needle number of starting reinforcing-sewing and reverse-sewing(effective when machine head HMI is not used)	1~32(needles)	3
18	Ending reinforcing-sewing needle number C	Needle number of ending reinforcing-sewing and reverse-sewing(effective when machine head HMI is not used)	1~32(needles)	3
19	Ending reinforcing-sewing needle number D	Needle number of ending reinforcing-sewing and obverse sewing(effective when machine head HMI is not used)	0~32(needles)	3
20	fixed-length sewing needle number	Fixed-length sewing needle number(effective when machine head HMI is not used)	1~99(needles)	10
21	Repeat number of continuous rein forcing-sewing	Continuous reinforcing-sewing number back and forth(effective when machine head HMI is not used)	1~99(time)	5
22	Control mode for pressor foot lifting	Setting of pressor foot lifting mode 0:pressor foot lifting unavailable 1:treadle pressor foot lifting(default for treadle at thread-cutting position) 2:treadle+automatic pressor foot lifting after thread-cutting 3:treadle+middle stopping+automatic pressor foot lifting after thread-cutting	0~3	2
23	Power on and positioning	setting of machine head moving to upper needle position when powered on 0:unavailable 1:available	0/1	1
24	Signal mode for turn/lift seitch	setting of signal mode of turn/lift switch of machine head 0:always open 1:always close	0/1	0
26	Bobbin thread control	Setting of signal mode of turn/lift switch	0/1	0

		ofmachine head 0:unavailable 1:available		
27	Stitch counting setting	Bobbin monitoring earlt-alarming target counting value	0~250(×200)	5
30	Pressor foot lifting delays sewing	Delay with pressor foot lowered	0~800(ms)	200
31	Output time of total pressure of presspr foot lifting	Output time of total pressure of pressor foot lifting	0~800(ms)	150
32	Output duty cycle of pressor foot lifting	Output duty cycle of pressor foot lifting	0~100	15
33	Protection time for pressor foot lifting	Pressor foot lifting stops protection time forcefully	1~60(s)	12
34	Output duty cycle of reverse-sewing time	Output duty cycle of reverse-sewing	0~800(ms)	150
35	Output duty cycle of reverse-sewing	output duty cycle of reverse-sewing	0~100	35
36	Reverse-sewing protection time	Reverse-sewing stops protection time forcefully	1~60(s)	12
41	Continuous reinforcing-sewing compensation 1	Parameter of continuous reinforcing-sewing stitch compensation	0~72	18
42	Continuous reinforcing-sewing compensation 2	Parameter of starting reinforcing-sewing stitch compensation	0~72	18
43	Parameter of special functions	Parameter of special functions P43=5,staying time exceed 2 sec, restore P1~P42 factory-set value	0~15	0

- Marked Items are used for repair and maintenance, modification of factory-set value may do damage to the machine or lead to decline of performance. Professionals must be consulted if modification is necessary. However, set values may be modified anytime for improvement of the functions and performance of sewing machine.

8. Instructions for System Configuration

P1: Highest sewing speed

Setting range”300~MAX”,and MAXrefers to senior parameter P53。

P1~P3：Relation between treadle stroke and speed

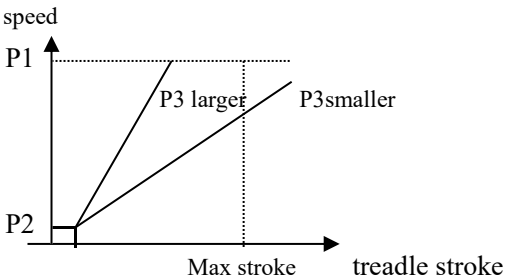


Fig 1　Relation between treadle stroke and speed curve

It can be seen from the figure above that if P3 curve slope is too small then the highest Sewing speed set by P1 may not be reached.

P8: Reinforcing-sewing selection

Decorative reinforcing-sewing:Nonstop during reinforcing can ensure consistency of stitch.Stopping time is determined by P10.

Standard reinforcing-sewing ： nonstop during reinforcing back and forth,reinforcing-sewing is finished at a time.

P12~P14:relevant parameters for soft start

If starting sewing speed is too high,top and base may not ccombine,limit the starting sewingspeed of sewing machine can raise sewing reliability.

Speed of sewing machine can raise sewing reliability.

Note:if the set starting reinforcing-sewing is available,then soft start function unavailable.

P15: Sewing mode

When P15=0,1,2,setting is only available without machine head operation box.

When P15=3,sewing mode is plain sewing mode,whether there is machine head operation box or not.

Plain sewing is usually used if:machine head sensor is damaged and failure E011 is notified.

1.for plain sewing,there is no thread-chtting and automatic reverse-and obcerse sewing function;

2.machine needle may stops at any position,treadle backwards,pressor foot lifting Function is default.

3.automatic searching for upper needle position function and needle number counting function fail automatically.

P16~P21:relevant parameters of sewing needle number

Note:when there is no machine head operation,use chassis operation panel to set these parameters,relevant parameters are available after activation.When machine head operation box exists,use the setting of machine hea operation box as standard.

P22:control mode of pressor foot lifting

Default treadle pressor foot lifting available.If the sewing machine has no pressor foot lifting device,it is recommended to set this function code as 0,or starting sewing will be slow.

Note:when P22is set to 2 or 3,treadle signal can terminate automatic pressor foot lifting status after thread-cutting,i.e.treadle return to zero(treadle not pressed by foot)pressor foot lifting lowers accordingly,press treadle backwards to lift pressor foot.

P23:power-on location function

Powered on the first time ,system will automatically rotate to upper needle position.If the handwheel of the sewing machine is already within the effective range of upper needle position then system will no run.

P26: bobbin thread control

If setting is effective the needle number will reach the number preset by P27,machine head operation box buzzes for notification,LED flashes and sewing will not be affected.To continue sewing,LED lights solidly and will not turn off until the last stitch is finished.Internal counter is cleared and finished stitch number can be viewed through monitoring parameter4.

To replace rotating hook,it is recommended to use button 2on machine head to clear Manually,which means that internal counting will not add each time bobbin thread is replaced,ensuring accuracy of stitch counting early warning.Keep pressing button 2 for about 2 seconds for manual clearing,buzzer buzzes for clearing completion.

P37~P42:stitch adjustment parameters for standard starting and ending

Reinforcing-sewing and continous reinforcing-sewing mode

Seitch compensation principle:difference between reverse and obverse sewing is small,consisitency of reverse-sewingmechanism is good.

Adjustment methods:set reverse and obverse sewing as the same needle number,and adjust 2 parameters according to the following methods.

1)compensation of starting reinforcing-sewing(parameterNo.37~38)

Connection between obverse-and reverse-sewing

Reduce parameter No.37,if the number of obverse-sewing decreases or the last stitch becomes short.

Increase parameter N0.37, if the number of obverse-sewing decreases or the first stitch becomes short.

Connection between reverse- and obverse-sewing

Reduce parameter No.38,if the number of obverse-sewing decreases or the last

stitch becomes short.

Increase parameter N0.38, if the number of obverse-sewing decreases or the first stitch becomes short.

2)compensation of ending reinforcing-sewing(parameterNo.39~40)

Connection between reverse-and obverse-sewing

Reduce parameter No.39,if the number of obverse-sewing decreases or the last stitch becomes short.

Increase parameter N0.39, if the number of obverse-sewing decreases or the first stitch becomes short.

Connection between obverse- and reverse-sewing

Reduce parameter No.40,if the number of obverse-sewing decreases or the last stitch becomes short.

Increase parameter N0.40, if the number of obverse-sewing decreases or the first stitch becomes short.

3)compensation of continuous reinforcing-sewing(parameterNo.41~42)

Connection between obverse-and reverse-sewing

Reduce parameter No.41,if the number of obverse-sewing decreases or the last stitch becomes short.

Increase parameter N0.41, if the number of reverse-sewing decreases or the first stitch becomes short.

Connection between reverse- and obverse-sewing

Reduce parameter No.42,if the number of reverse-sewing decreases or the last stitch becomes short.

Increase parameter N0.42, if the number of obverse-sewing decreases or the first stitch becomes short.

P44~P53:setting of senior parameters

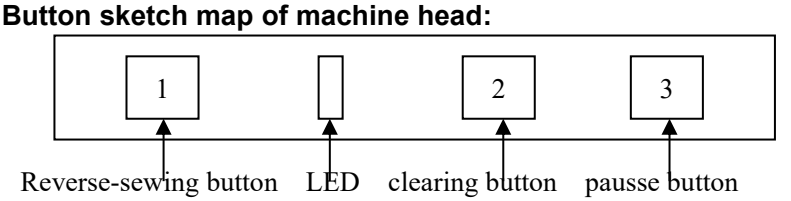
When P43=11,senior parameter setting can be entered.It is mainly used to adjust machine position and set parameters for aging machines.And the highest speed of the sewing machine can be set.

P45:lower needle position of machine needle

The lower needle position begins with upper needle position as zero.If decorative

Reinforcing-sewing is selected and stitch error is found,fine tune P45 parameter for correction.Incorrect insrallation of upper needle affects lower needle position,pay attention to installation consistency when installing upper needle sensor.

Attachment:Button sketch map of machine head:



9. Error Code Table

Error codes	Contents	Checking and treatment
E011 E012 E013 E014	electric engine signal error	If electric engine plug is well contacted if electric engine signal detecting device has been broken if sewing machine handwheel correctly installed
E021 E022 E023 E201	electric engine overload	If electric engine plug is well contacted if machine head or thread-cutting mechanism has been blocked completely if materials are too thick
E111 E112 E113	Voltage too high	If the voltage on the inlet wire is too high
E121 E122	Voltage too low	If the voltage on the inlet wire is too low
E151 E152	magnet error	If machine head magnet suffers short circuit
E211 E212	Abnormal electric engine operation	If electric engine plug is well contacted If electric engine signal is matched
E301	Poor operation box communication	if operation box plug is well contacted if operation box components are damaged
P.oFF	Power-fail	Wait for power supply to resume
L.oiL	Refill oil	Keep pressing key P to cancel notice after refilling

Note: consult technical support if errors still exist.