AC 伺服马达

AC SERVO MOTOR

一体化多功能

Integration Multifunction

说明书

Manual

安全指示

1. 在安装或使用本产品时，使用者必须彻底并仔细研读本操作手册。
2. 所有标上⚠符号之指示，必须特别注意或执行，否则可能会导致身体伤害。
3. 本产品须由受过正确训练的人员来安装或操作。
4. 为安全起见，禁止以延长线作电源座供应二项以上的电器产品使用。
5. 当连接电源线到电源座时，必须确定此电压低于 AC 250V，且符合标在马达铭牌上的指定电压。

***注意 ：电控箱电源规格如为 AC220V 时，请勿插接至 AC380V 的电源插座上，否则将出现异常且电机将无法动作。此时请立即关闭电源开关，重新检查电源。持续供应 380V 超过五分钟以上，将可能烧损电控箱上的保险丝 F2、电解电容（C58、C59）及电源模块 U14，而危及人身安全。**

6. 请不要在日光直接照射的场所、室外及室温 45℃以上或 5℃以下的场所操作。
7. 请不要在暖气（电热器）旁、有露水的场所及在相对湿度 30%以下或 95%以上的场所操作。
8. 请不要在灰尘多的场所、具有腐蚀性物质的场所及有挥发性气体的场所操作。
9. 请注意电源线不要受压或过度扭曲。
10. 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。
11. 所有可转动的部分，必须以所提供的零件加以防范露出。
12. 在第一次开电后，先以低速操作缝纫机并检查转动方向是否正确。
13. 在操作以下动作前，请先关闭电源：
    1) 在控制箱与马达上插或拔任何连接插头时。
    2) 穿针线时。
    3) 翻抬车头时。
    4) 修理或作任何机械上的调整时。
    5) 机器休息不用时。
14. 修理或高层次的保养工作，仅能由受过适当训练的机电技师来执行。
15. 所有维修用的零件，须由本公司提供认可，方可使用。
16. 请不要以不适当物体来敲击或撞击本产品及各装置。

保修期限

本产品保修期限为购买日期起一年内或出厂月份起两年内。

保修内容

本产品在正常情况且无人为失误的操作下，于保修期间无偿的为客户维修使能正常操作。

但以下情况于保修期间将收取维修费用：

1、 不当使用包括误接高压电源、将产品移做其它用途、自行拆卸、维修、更改、或不依规格范围使用、进水进油及插入异物于本产品。

2、 火灾、地震、闪电、风灾、水灾、盐蚀、潮湿、异常电压及其它天灾或不当场所造成的损害。

3、 客户购买后摔落本产品，或客户自行运输（或托付运输公司）造成的损害。

*** 本产品在生产及测试上皆尽最大努力和严格控制使其达到高品质及高稳定的标准，但外部的电磁或静电干扰或不稳定的供应电源，仍可能对本产品造成影响或损害，因此操作场所的接地系统一定要确实做好，并建议用户安装故障安全防护装置（如漏电保护器）。**

目录

1：操作说明

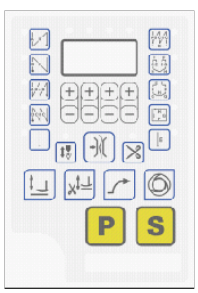
1.1： 按键说明

起始 / 终止回缝		执行 2 次起始回缝。 相应 LED 灯不亮时：表示关闭相应功能。
		执行 1 次起始回缝。 相应 LED 灯不亮时：表示关闭相应功能。
		1.执行 2 次终止回缝。 2.相应 LED 灯不亮时：表示关闭相应功能。
		1.执行 1 次终止回缝。 2.相应 LED 灯不亮时：表示关闭相应功能。
自由键		一旦踏板往前踏下就正常车缝，当踏板回到中立时，立即停止车缝。 当踏板往后踏时，就自动完成切线 / 扫线等动作。 相应 LED 灯不亮时：表示关闭相应功能。
连续回缝		1.一旦踏板往前踏下 ,就自动执行来回的连续回缝动作 ,来回次数由 D 段设定。 ∴ 前踏之后即自动执行此功能到完成切线为止，中途不会停止车缝，除非将踏板往后踏可解除动作。 2.相应 LED 灯不亮时，表示关闭相应功能。
定针缝	 OR  OR  OR 	当踏板往前踏下时，就执行 E，F 段或 G，H 段定针缝的针数。 在任何一段车缝途中，一旦踏板回到中立时，车缝立即停止，此时当踏板再次往前踏下，即开始执行 E，F 或 G，H 段未完成的针数。 当参数【010.ACD】设定为 ON 时，在执行完最后一段 E，F 或 G，H 段针数后则自动连贯完成终止回缝或切线等动作。 相应 LED 灯不亮时，表示关闭相应功能。
进入和确定存储内容值		进入参数内容值，其内容值如经调整变更后，需按下  键予以储存确认。
夹线功能快捷键		当按下该键第四位数字后的小数点点亮表示夹线器打开 ,小数点不亮夹线器关闭

触发自动 （AUTO）		1.在自由缝的式样中：按下此键无功能，LED 灯亦不亮。 2.在定针缝的式样中按下此键： 当踏板一经往前踏下触发，则自动执行 E，F 段或 G，H 段中所设定的针数，直到段内针数完成后自动停止。 再逐一触发踏板，则自动执行下一段所设定的针数直到自动完成切线、扫线等动作为止。 相应 LED 灯不亮时，表示关闭相应功能。
切线开关		1.设定使用或取消切线功能。 2.相应 LED 灯不亮时，表示关闭相应功能。
进入参数区功能键		一般模式下按【P】键进入用户参数模式（参数内容见 2.1 参数内容表） 按住【P】键开机进入技术员参数模式(参数内容见 2.2 参数内容表)
设置数值递增/参数递增		1、A、B、C、D、E、F、G、H 的设定针数增加。 2、参数选择区内当参数递增键。 3、参数内容区内当设定数值递增键。
设置数值递减/参数递减		1、A、B、C、D、E、F、G、H 的设定针数减少。 2、参数选择区内当参数递减键。 3、参数内容区内当设定数值递减键。
上下停针键		1、相应的 LED 灯亮时，表示停车在上定位。. 2、相应的 LED 灯不亮时，表示停车在下定位。
剪线抬压脚		1、按住按键 3 秒 LED 灯亮时，切完线后压脚自动抬起。 2、按住按键 3 秒 LED 灯不亮时，无自动抬压脚功能。
停车抬压脚		1、按住按键 3 秒 LED 灯亮时，车缝中马达停止时压脚自动抬起。 2、按住按键 3 秒 LED 灯不亮时，无自动抬压脚功能。
慢速起缝		1、相应 LED 灯亮时，慢速起缝打开。 2、相应的 LED 灯不亮时，无慢速起缝功能。

1.2：一体化控制箱的调试

1.2.1 恢复出厂设置



按住两个 ，同时开机　　再按 S 键确定　　再按 P 键退出，关机重启

1.2.2： 进入用户模式及修改

按 P 键进入用户参数

按加、减键对用户参数项数进行修改，按 S 进入参数项

再 S 键确认退出

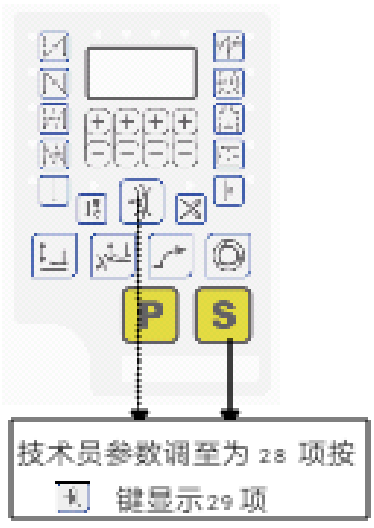
1.2.3： 进入技术员模式及修改

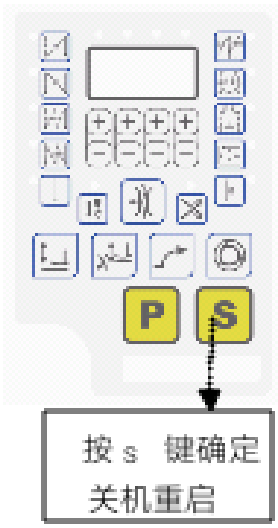
按住 P 键不放，同时开机

按加、减对技术员参数项数进行修改按 S 进入参数项

按加、减对技术员参数进行修改，按 S 确定

1.2.4 参数保存





1.2.5 调整自动回缝缝迹同步平齐度的补偿

1.2.5.1【起始回缝】的补偿部分

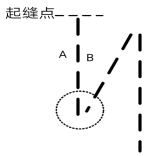
请注意：P18.BT1 与 P19.BT2 的补偿值因各车头机型码的不同，其出厂预设值亦会随之不同。

按 P 进入用户参数

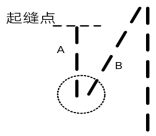
按加减键找出 P18、P19
按 S 确定进入参数内容

按加减键调整 P18、P19 适当的补偿值
调整后按 S 键储存确认

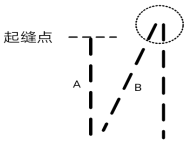
调整范例说明：假设起始回缝针数 A、B 段均设定在相同针数下（A=3 针、B=3 针）建议：请先将 A 段的补偿值设定完成后，才继续 B 段补偿值的设定步骤。



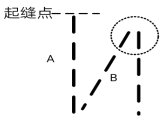
A 段针数比设定针数值多出，造成 B 段无法回缝至起缝点时：请调整【BT1】内容值作适当调整



A 段针数比设定针数值短小或折针，造成 B 段超出起缝点时：
请调整【BT1】内容值作适当调整



B 段针数比设定针数值多出，造成超出起缝点时：
请调整【BT2】内容值作适当调整



B 段针数比设定针数值短小或折针，造成无法回缝至起缝点时：
请调整【BT2】内容值作适当调整

1.2.5.2【终止回缝】的补偿部分

请注意：025.BT3 与 026.BT4 的补偿值因各车头机型码的不同，其出厂预设值亦随之不同

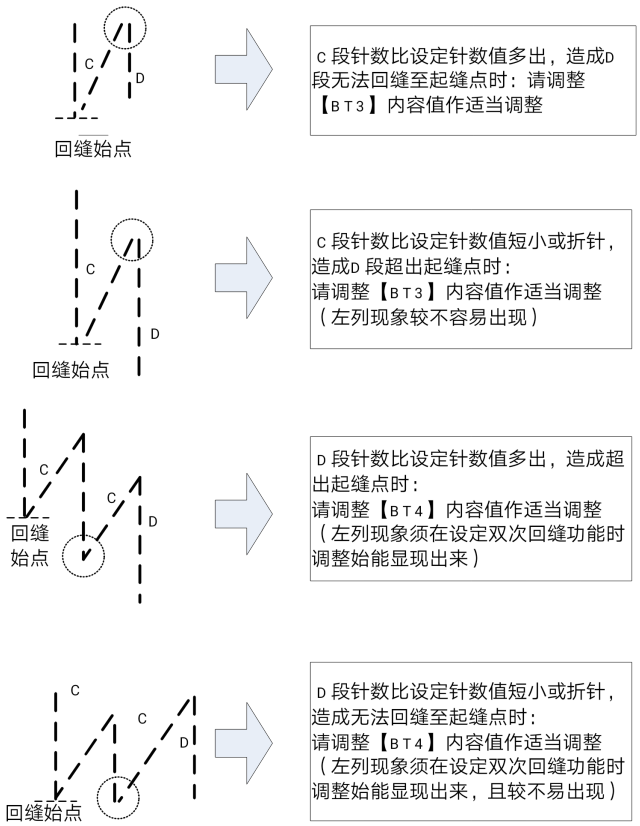
按 P 键进入用户参数

按加减键找出 P25、P26，按 S 确定进入参数内容区

按加减键调整 P25、P26 适当的补偿值调整后按 S 键储存确认

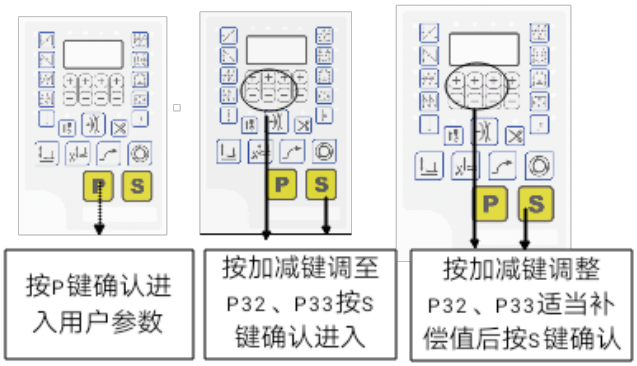
调整范例说明：假设终止回缝针数 C、D 段均设定在相同针数下（C=3 针、D=3 针）

建议：请先将 C 段的补偿值设定完成后，才继续 D 段补偿值的设定步骤。



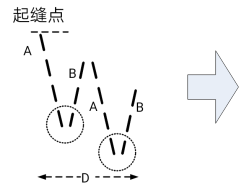
1.2.5.3【连续回缝】的补偿部分

请注意：032.BT5 与 033.BT6 的补偿值因各车头机型码的不同，其出厂预设值亦随之不同

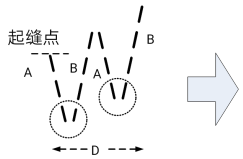


调整范例说明：假设连续回缝针数 A、B 段均设定在 4 针，而来回次数 D 设定在 4 回下

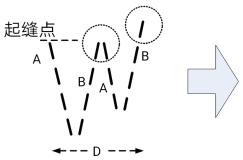
建议：请先将一、三段（A）段的补偿值设定完成后，才继续第二、四段（B）补偿值的设定步骤。



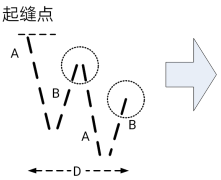
第一段（A段）针数比设定针数值多出，造成第二段（B）段无法回缝至起缝点时：请调整【BT5】内容值作适当调整



第一段（A段）针数比设定针数值短小或折针，造成第二段（B）段回缝针迹超出起缝点时：请调整【BT5】内容值作适当调整



第二段（B段）针数比设定针数值多出，造成超出起缝点时：请调整【BT6】内容值作适当调整



第二段（B段）针数比设定针数值短小或折针，造成无法回缝至起缝点时：请调整【BT6】内容值作适当调整

1.2.6 手动调整定位

1.2.6.1 手动调整上定位

按住P、S键开机进入第三级参数P70

按加减键找出P72按确定进入参数内容，先转动手轮一周后进行调整上定位（40~96有效）

按键进行保存参数，此时参数就是P58所需的上定调整参数

1.2.6.2 手动调整下定位

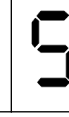
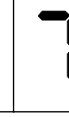
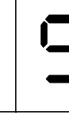
按住P、S键开机进入第三级参数P70

按加减键找出P73按确定进入参数内容，先转动手轮一周后进行调整上定位（40~96有效）

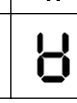
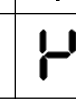
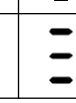
按键进行保存参数，此时参数就是P59所需的下定调整参数

1.2.7 数码显示说明

数字字体部分：

实际数值	0	1	2	3	4	5	6	7	8	9
液晶显示										

英文字体部分

英文字母	A	B	C	D	E	F	G	H	I	J
液晶显示										
英文字母	K	L	M	N	O	P	Q	R	S	T
液晶显示										
英文字母	U	V	W	X	Y	Z				
液晶显示										

2：用户参数&技术员参数

2.1 用户参数

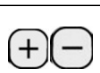
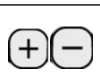
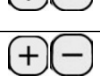
参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
P01	最高转速（spm）	100 ~ 3700	3700		车缝时的最高转速设定
P02	加速曲线调整（%）	1 ~ 100%	80		控速器爬升斜率设定 斜率值愈大，速度愈陡；斜率值愈小，速度愈慢
P03	针停定位选择 UP：上　DN：下	UP / DN	DN		同按键面板上之快速功能键 UP：上停针　DN：下停针
P04	起始回缝速度（spm）	200 ~ 2200	1800		前段回缝（起始回缝）时的速度设定
P05	终止回缝速度（spm）	200 ~ 2200	1800		后段回缝（终止回缝）时的速度设定
P06	连续回缝速度（spm）	200 ~ 2200	1800		连续回缝时的速度设定
P07	慢速起缝速度（spm）	200 ~ 1500	400		慢速起缝时的速度设定
P08	慢速起缝针数（针）	0 ~ 99 针	4		慢速起缝时的针数设定，每一单位代表半针
P09	自动定针缝速度（spm）	200 ~ 4000	3700		定针缝【P34.SMP】设定在 A 状态的速度设定(或选针盒 AUTO 键有按下时的速度设定)
P10	定针缝后自动执行终止回缝功能（不补针功能设定）	ON / OFF	ON		ON：在执行完最后一段定针缝后，将自动执行终止回缝动作。 注：亦即在任何缝制模式下，不能作补针功能。

参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
					OFF：在执行完最后一段定针缝后，将无法自动执行终止回缝功能，必须重新再作前或全后踏动作时可。 注：亦即在自由缝时，可以进行补针，但必须在【P11.RVM】设定在 B 状态下，时有效
P11	手按回缝时功能模式选择	J / B	J		手按车头回缝开关动作时机： J：JUKI 方式（在车缝中或中途停止时具有动作） B：BROTHER 方式（在车缝中始有动作）
P12	起始回缝运动模式选择	A / M	A		起始回缝段，倒退电磁线圈动作时机： A：轻触踏板，即自动执行起始回缝 M：受踏板控制，可任意停止
P13	起始回缝结束点操作模式选择	CON / STP	CON		CON：起始回缝段完成后，自动连续下一段功能 STP：起始回缝段针数完成后自动停止
P14	慢速启动	ON / OFF	OFF		ON：慢速启动功能开启 OFF：慢速启动功能关闭
P15	起始回缝功能 A 段针数之设定	1 ~ 15 针	3		起始回缝 A、B 段的针数设定 由前面快捷设置，这里设置无效
P16	起始回缝功能 B 段针数之设定	1 ~ 15 针	3		
P17	起始回缝功能来回次数之设定	1 ~ 4 回	2		起始回缝来回次数设定 由前面快捷设置，这里设置无效
P18	起始回缝补偿 1	0 ~ 31	1		①0 ⟶ 15 动作逐步延迟 ②16 ⟶ 31 动作逐步提前 ③0 比 16 的动作要延迟
P19	起始回缝补偿 2		10		
P20	终止回缝运动模式选择	A/M	A		终止回缝段，倒退电磁线圈动作时机： A：车缝后踏板全后踏，即自动执行终止回缝 M：受踏板控制，可任意停止
P21	终止回缝功能选择	ON / OFF	ON		ON：终止回缝功能开启 OFF：终止回缝功能关闭 由前面快捷设置，这里设置无效
P22	终止回缝功能 C 段针数之设定	1 ~ 15 针	3		终止回缝 C、D 段针数数设定 由前面快捷设置，这里设置无效
P23	终止回缝功能 D 段针数之设定	1 ~ 15 针	3		
P24	终止回缝功能来回次数之设定	1 ~ 4 回	2		终止回缝来回次数设定 由前面快捷设置，这里设置无效
P25	终止回缝补偿 3	0 ~ 31	1		①0 ⟶ 15 动作逐步延迟 ②16 ⟶ 31 动作逐步提前 ③0 比 16 的动作要延迟
P26	终止回缝补偿 4		10		

参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
P27	薄料、厚料选择	0 / 1	1		1：薄料　0：,厚料
P28	连续回缝运动模式选择	A/M	A		连续回缝段，倒退电磁线圈动作时机： A：轻触踏板，即自动执行连续回缝 M：受踏板控制，可任意停止
P29	半反踏踏板曲线	100	20~220		调整半反踏行程
P30	连续回缝针数设定	1 ~ 99 针	4		连续回缝来回针数设定 由前面快捷设置，这里设置无效
P31	连续回缝来回次数设定	1 ~ 15 次	4		连续回缝来回次数的设定 由前面快捷设置，这里设置无效
P32	连续回缝补偿 5	0 ~ 31	1		①0 ⟶15 动作逐步延迟 ②16⟶ 31 动作逐步提前 ③0 比 16 的动作要延迟
P33	连续回缝补偿 6		10		
P34	定针缝运动模式选择	A / M	M		A：轻触脚踏板，即自动执行定针缝动作 M：受脚踏板控制，可任意停止与启动
P35	定针缝功能设定	ON / OFF	OFF		ON：定针缝功能开启 OFF：定针缝功能关闭 由前面快捷设置，这里设置无效
P36	定针缝段数选择	1 ~ 250 针	00		【P35. PM】设定在 ON 状态下，始能执行各段所设定的针数（P1 ~ P4 段于出厂时已被预设 15 针） 由前面快捷设置，这里设置无效
P37	拨线出力功能设定（夹线器力道设置）	ON / OFF （0—10）	ON （7）		0：无动作 1 为拔线动作 2 ~ 11 为夹线动作，动作力度逐步变大
P38	切线出力功能设定	ON / OFF	ON		ON：有切线动作 OFF：无切线动作
P39	车缝途中停止时，压脚出力选择 UP：上　DN：下	UP / DN	DN		同按键面板上之快速功能键 UP：车缝停止时，自动抬起压脚 DN：车缝停止时，不自动抬压脚（由踏板后踏控制）
P40	切完线停止时，压脚出力选择 UP：上　DN：下	UP / DN	DN		同按键面板上之快速功能键 UP：切完线后，自动抬起压脚 DN：车切完线后，不自动抬压脚（由踏板后踏控制）
P41	车缝完成件数显示	0 ~ 9999	0		自动累计完成件数
P42	车缝速度显示		0		自动显示车缝时的转速状况（速度值仅供参考）
P43	马达转动方向设定（正反转）	CW / CCW	CCW		CW：顺时针方向 CCW：　逆时针方向

2.2　技术员参数

参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
P44	车头皮带轮之尺寸（mm）	50 ~ 200	15		随车头机型码之设定，已预置车头皮带轮尺寸。

参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
P45	马达皮带轮轮之尺寸（mm）	50 ~ 150	65		随车头机型码之设定，已预置马达皮带轮尺寸
P46	切线后，反转提针角度的功能选择	ON / OFF	OFF		ON：切完线后，自动作反转的功能。（角度由【P47.TR8】调整决定） OFF：无作用
P47	切线后，反转提针角度的调整	50 ~ 200	160		切完线后，由针上算起以反向运转作提针的角度调整。
P48	低速（定位速度）（spm）	100 ~ 500	210		定位速度设定
P49	切线速度（spm）	100 ~ 500	300		调整切线周期时的电机速度
P50	抬压脚提升时间（ms）	10 ~ 990	120		压脚提升动作时调整项
P51	压脚出力动作的周期信号（%）	10 ~ 90	30		压脚动作时，以周期性省电输出，避免压脚发烫
P52	压脚下放时间（ms）	10 ~ 990	120		压脚延时下放调整项
P53	半后踏取消抬压脚功能	ON / OFF	ON		ON：半后踏时，无抬压脚出力 OFF：半后踏时，有抬压脚出力
P54	切线动作时间（ms）	5 ~ 100	10		切线时序所需的动作时间
P55	夹线器动作角度/（拨 / 扫线动作时间）	1-360 （10 ~ 990）	380 （50）		夹线器松开定位角度（拨 / 扫时序的动作时间）
P56	开电后自动找上定位	ON / OFF	ON		ON：开启电源后，自动找到上定位信号后停止 OFF：无作用
P57	抬压脚保护时间（s）	1 ~ 120	10		压脚连续抬起超过设置时间自动落下
P58	上定位调整	40 ~ 180	40		上定位调整，数值减少时会提前停针，数值增加时会延迟停针
P59	下定位调整	40 ~ 180	50		下定位调整，数值减少时会提前停针，数值增加时会延迟停针
P60	测试速度（spm）	100 ~ 7500	2000		设置测试速度
P61	A 项测试	ON / OFF	OFF		A 项测试选项，设定后将按【P60. TV】所设定之速度持续运行
P62	B 项测试	ON / OFF	OFF		B 项测试选项，设定后将按【P60. TV】所设定之速度执行启动-车缝-停车-剪线的循环
P63	C 项测试	ON / OFF	OFF		C 项测试选项，设定后将按【P60. TV】所设定之速度执行无定位动能的启动-车缝-停车的循环
P64	测试 B、C 导通时间	1 ~ 250	20		B、C 项测试中，设置导通时间
P65	测试 B、C 停车时间	1 ~ 250	20		B、C 项测试中，设置停车时间

参数项目内容	中文说明	范围	初始值	设定键别	内容值名称说明与备注
P66	机头保护开关检测	0~2	1	⊕⊖	0：不检测，1：检测零信号，2：检测正信号
P67	剪线保护开关检测	ON / OFF	OFF	⊕⊖	OFF：不检测，ON：检测
P69	夹线器启动调整项	10~990	100	⊕⊖	夹线器启动时定位角度

2.3 薄料与中厚料

薄料与中厚料方面的参数					
P27	薄料、厚料选择	0 / 1	0	⊕⊖	1：薄料　0：,厚料
P48	低速（定位速度）(spm)	100 ~ 500	500	⊕⊖	定位速度设定，随布料加厚只需将其调大
P49	切线速度（spm）	100 ~ 500	350	⊕⊖	调整切线周期时的电机速度，随布料加厚只需将其调大

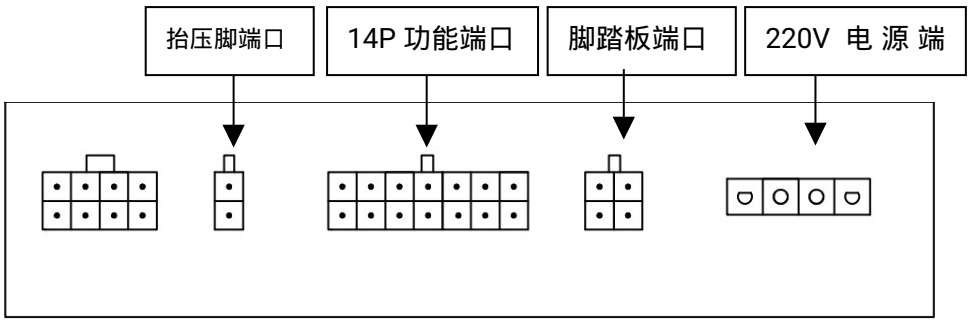
3：错误代码表

错误码	内容	对策
E1	1)电力模块错误代码 2)不正常过电流或过电压	将模块驱动出力与机头出力全部关闭 等待电源重新开启/复位 （请仔细检查电源板各项机能）
E2	1）电源 ON 时，主电压检测过低 2）插错电压或供应电压过低时	模块驱动出力与机头出力将全部关闭 请检查供应此控制箱之 AC 电源是否正常。（或是否低于使用常规的额定电压） 请检查主板控制回路机能是否异常。
E3	前面操作盒于 CPU 传输通信异常	将模块驱动出力与机头出力全部关闭 请检查操作盒信号配线是否异常或故障。
E5	控速器接触异常	将模块驱动出力与机头出力全部关闭 请检查控速器是否有松动、接触不良或控速器有故障
E7	a)马达插头配线接触不良导致不转　b)定位器信号异常。 c)车头机构死锁或马达皮带异物卷入卡死。 d)加工物过厚，马达扭力不足无法贯穿。 e)模块驱动出力异常。	将模块驱动出力与车头出力全部关闭。 等待电源重新开启/复位。 （请检查车头是否卡住或定位器、马达、模块驱动等信号是否异常）
E8	连续手动倒缝超过 15 秒	将模块驱动出力与车头出力全部关闭。 等待电源重新开启/复位。
E9	定位器信号异常	检查上下定位信号是否正常，或皮带轮是否过于松动。.

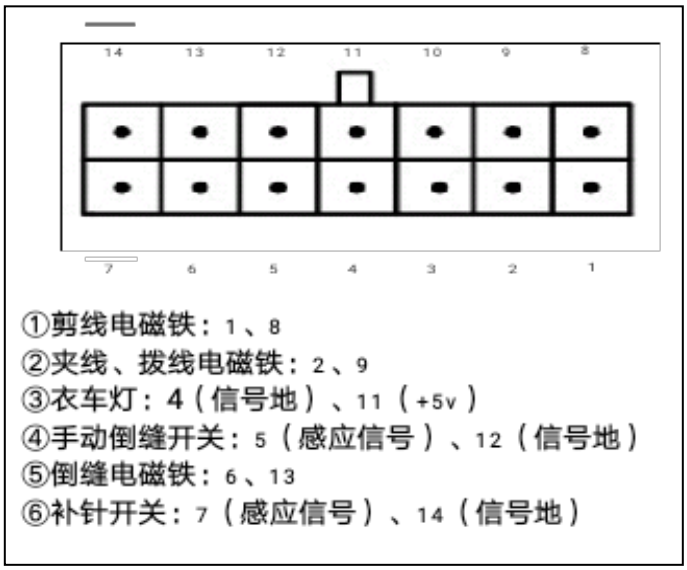
E11	电源开启即自动找上定位，但定位器有插入控制箱，针上信号无法输出。	自动进入无定位器模式，且切线、扫线、上定位等以及所有定针缝样式缝制功能亦无效。 马达可正常操作。 （请检查定位器是否异常）。
E12	电源开启时，未插入定位器。	自动进入无定位器模式运作，且切线、扫线、上定位等以及所有定针缝式样缝制功能亦无效。 马达可正常操作。 （请检查定位器是否忘记插入或异常）
E13	电力模块过热保护	检查电力模块与散热片是否接触良好。
E14	编码器信号异常	检测编码器信号是否正常，或更换编码器。
E15	电力模块不正常过流保护	模块驱动出力与机头出力将全部关闭。 等待电源重新开启/复位。 （请仔细检查电源板各项机能）
E17	机头保护开关没到正确位置	检查机头是否掀开，机头开关是否损坏。

4：端口示意图

4.1： 各个端口名称：



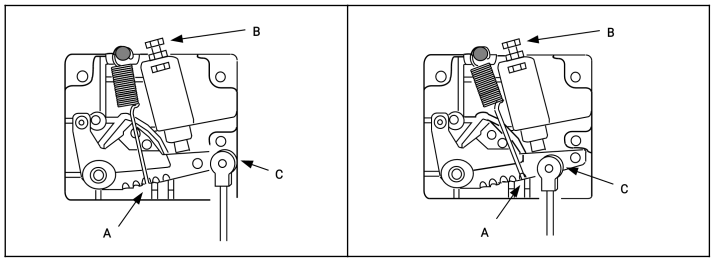
4.2： 14P 功能端口对应表



5 安 装说明

5.1 控速器踏板拉力的调整

一般安装示意图	有加装 VD 吸风装置时的安装示意图



A：前踏拉力弹簧

B：后踏紧度制退的调整螺丝组

C：踏板旋臂拨杆挂钩孔

∴ 踏板连接器有加装 VD 吸风系列装置时，建议将 A 与 C 改变安装如右图所示

5.2 一体化电控安装操作说明

1） 将配套的电机②安装在机体上，注意线出口朝向机器后盖板方向紧定电机所有定位螺钉。

2） 取出已装配好的一体化电控④将 M5×20 螺钉与平垫装在电控箱最上方的螺钉孔上 ,再在螺钉上套上 O 型圈.

3） 将电机编码器线连接至电控，将电机电源插头连接至电控。

4） 调整电源线与编码器线绕过电机，将电控套入电机紧贴至机体后端平面。

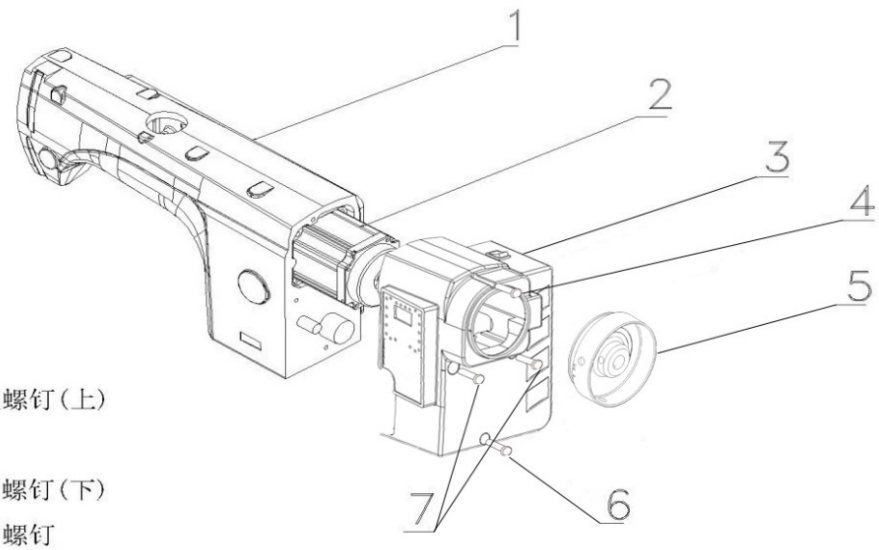
5） 用长柄六角扳手套上螺钉⑦穿入电孔与机体螺孔装配。

6） 用长柄六角扳手套上螺钉④穿入塑料上螺孔与机体螺孔装配.

7） 用长柄六角扳手套上螺钉⑥穿入塑料下螺孔与机体螺孔装配.

8） 调整电控位置与机体外观相吻合，旋紧螺钉④⑥，再旋紧螺钉⑦

9） 装配手轮⑤，开机测试。



1.机体
2.电机
3.电控
4.塑料罩盖螺钉(上)
5.手轮
6.塑料罩盖螺钉(下)
7.铝件紧固螺钉

Safety Instruction

1. Users are required to read the operation manual completely and carefully before installation or

operation.

2. All the instruction marked with sign must be observed or executed; otherwise, bodily injuries might occur.
3. The product should be installed and pre-operated by well trained persons.
4. For perfect operation and safety, it is prohibited that using extension cable with multi-outlet for power connection.
5. When connecting power supply cords to power sources, it is necessary to make sure that the power voltage is lower than 250 VAC and matches the rated voltage indicated on the motor's name plate.

※Attention : If the control box is AC220V system, please don't connect to the AC380V power outlet, otherwise the error will occur and motor will not work. If that happened, please turn off the power voltage. Continue supply 380V power over 5 minutes might damage the fuse F2, burst the electrolytic capacitors and the power module U14 of the main board and even might endanger the person safety.

6. Don ' t operate in direct sun light , outdoors area and where the room temperature is over 45°C or below 5°C.
7. Please avoid operating near the heater at dew area or at the humidity below 30% or above 95%.
8. Don ' t operate in area with heavy dust, corrosive substance or volatile gas.
9. Avoid power cord being applied by heavy objects or excessive force, or over bend.
10. The earth wire of power cord must be connected to the system ground of the production plant by proper size of conductions and terminals. This connection should be fixed permanently.
11. All the moving portions must be prevented to be exposed by the parts provided.
12. Turing on the machine in the first time, operate the sewing machine at low speed and check the correct rotation direction.
13. Turn off the power before the following operation :
    a) Connecting or disconnecting any connectors on the control box or motor.
    b) Threading needle.
    c) Raising the machine head.
    d) Repairing or doing any mechanical adjustment.
    e) Machines idling.

14. **Repairs and high level maintenance work should only be carried out by electronic technicians with appropriate training.**
15. **All the spare parts for repair must be provided or approved by the manufacturer.**
16. **Don't use any objects or force to hit or ram the product.**

Guarantee Time

Warranty period of this product is 1 year dated from purchasing, or within 2 years from ex-factory date.

Warranty Detail:

Any trouble found within warranty period under normal operation, it will be repaired free of charge. However, maintenance cost will be charged in the following cases even if within warranty period:

1、Inappropriate use, including: wrong connecting high voltage, wrong application, disassemble, repair, modification by incompetent personnel, or operation without the precaution, or operation out of its specification range, or inserting other objects or liquids into the product.

2、Damage by fire, Earth quake, lighting, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.

3、Dropping after purchasing or damage in transportation by customer himself or by customer's shipping agency

*** Note: We make our best effort to test and manufacture the product for assuring the quality. However, it is possible that this product can be damaged due to external magnetic interference and electronic static or noise or unstable power source more than expected; therefore the grounding system of operate area must be well-connected to this product and it's also recommended to install a failsafe device. (such as residual current breaker).**

Contents

1： Operation

1.1： Key Function

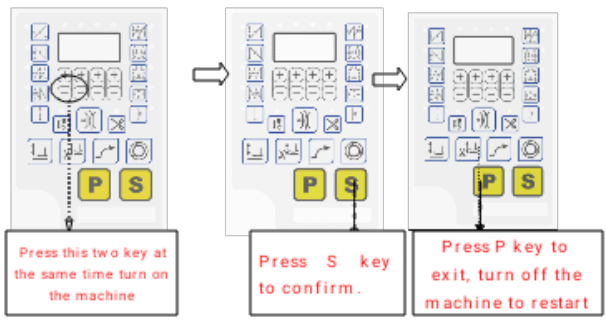
Start / End Back-Tacking Selection		Double start back-tacking The LED OFF indicate the corresponding function is turn off
		Dingle start back-tacking The LED OFF indicate the corresponding function is turn off.

		1. Double end back-tacking 2. The LED OFF indicate the corresponding function is turn off.
		1. Single end back-tacking 2. The LED OFF indicate the corresponding function is turn off.
Free Sewing		As the treadle is toed down, machine will start sewing. Once the treadle returns to neutral, machine will stop immediately. As the treadle is heeled back, machine will automatically start trimming cycle. The LED OFF indicate the corresponding function is turn off.
Bar-Tacking		1. Once the treadle is toed down, all the seams of Bar-Tacking will be completed with D times, and then the thread will automatically be trimmed. ∴ Note: When the Bar-Tacking Sewing starts, will not stop until the trimming cycle finished, except for the treadle heeled back to cancel the action. 2. The LED OFF indicate the corresponding function is turn off.
Constant-Stitch Sewing	 OR  OR  OR 	As the treadle is toed down, Constant-Stitch Sewing E,F or G,H performs section by section. Once the treadle returns to neutral intermediately in any section, machine will stop immediately. When the treadle is toed down again, the balance stitches of E, F, G or H goes on. If the parameter 【010.ACD】is set ON, machine will automatically go on to start trimming cycle or End Back-Tacking at the end of last section E, F, or G,H The LED OFF indicate the corresponding function is turn off.
Enter and save the value		Enter to the parameter value, press  key for confirmation andsave if the parameter value adjustment.
Clamp function keys		When the key is pressed decimal point after the fourth digit indicates the gripper to open light, the decimal point is not on the gripper closed
One-shot sewing selection		1. In Free sewing： One touch of this key makes beep sound without any function also LED does not light up In Constant-Stitch Sewing: One shot to the pedal, stitches number of E, F or G, H will be automatically performed. Toe down the pedal again and again to finish the rest sections until it finish pattern. The LED OFF indicate the corresponding function is turn off.

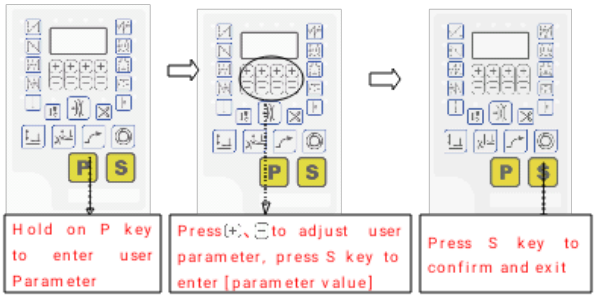
Trimming selection		1. Enable or disable the trimming cycle. 2. The LED OFF indicate the corresponding function is turn off.
Enter parameter value selection		In [Normal Mode], press【P】key to enter [User Parameter Mode] (the parameter content see 2.1 of parameter list) Press and hold【P】key, then turn on the power to enter [Technician Parameter Mode] (the parameter content see 2.2 of parameter list)
Value Increment Key		1、A、B、C、D、E、F、G、H section, increase the number of setting stitch . 2、Increase the parameter in Parameter selection. 3、Increase the setting value in Parameter value.
Value Decrement Key		1、A、B、C、D、E、F、G、H decrease the number of setting stitch 2、Decrease the parameter in Parameter selection. 3、Decrease the setting value in Parameter value.
Upper lower stitch stop setting		The related LED ON indicate stopping machine at the upper stop needle position. The related LED OFF indicate stopping machine at the lower stop needle position.
Trimming presser foot		1、 Press the key 3 seconds when the related LED ON, the presser foot automatically goes up after trimming. 2、 Press the key 3 seconds when the related LED OFF= Trimming Presser Foot is inactive.
Stop presser foot		1、 Press the key 3 seconds when the related LED ON , the presser Foot automatically goes up after motor stops. 2、Press the key 3 seconds when the related LED OFF=Stop Presser Foot is inactive.
Soft start		1、The related LED ON, the soft start is turn on. 2、the related LED OFF without soft start function.

1.2： Debugging of integration electric control box

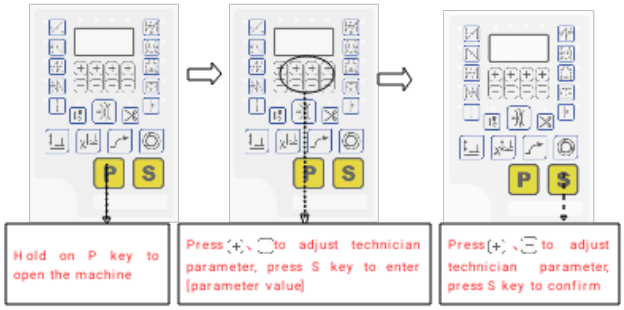
1.2.1 Restore factory setting



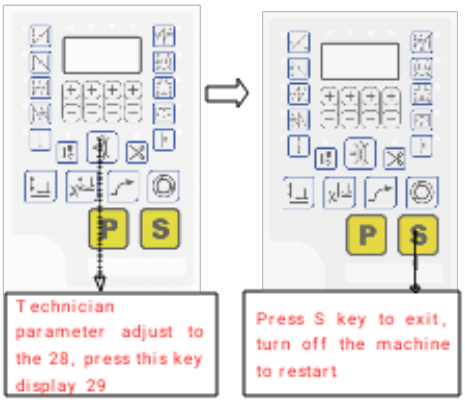
1.2.2： Enter to the user mode to changed valve



1.2.3： Enter to the technician mode to changed valve



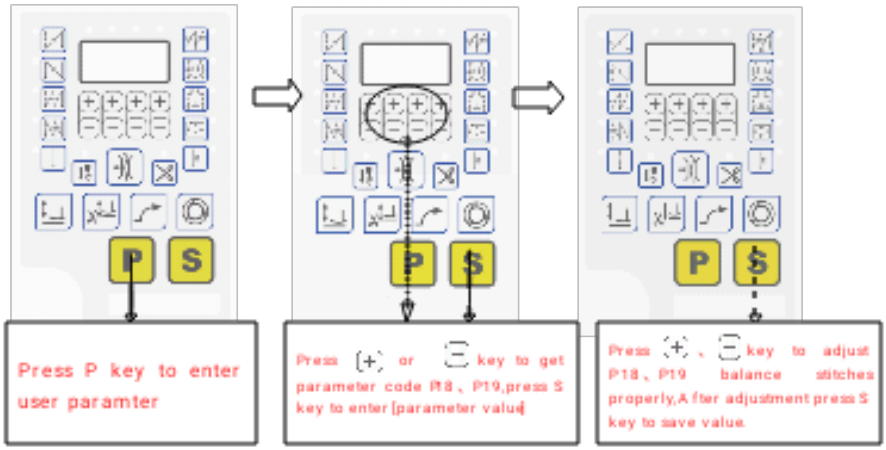
1.2.4 Save the parameter



1.2.5 Stitch Balance of Back-Tacking for Lockstitch Machine

1.2.5.1 How to Balance Stitches for 【Start Back-Tacking】

Noted：Factory defaults of balance stitches for P18.BT1 and P19.BT2are different because of different types of machine head.

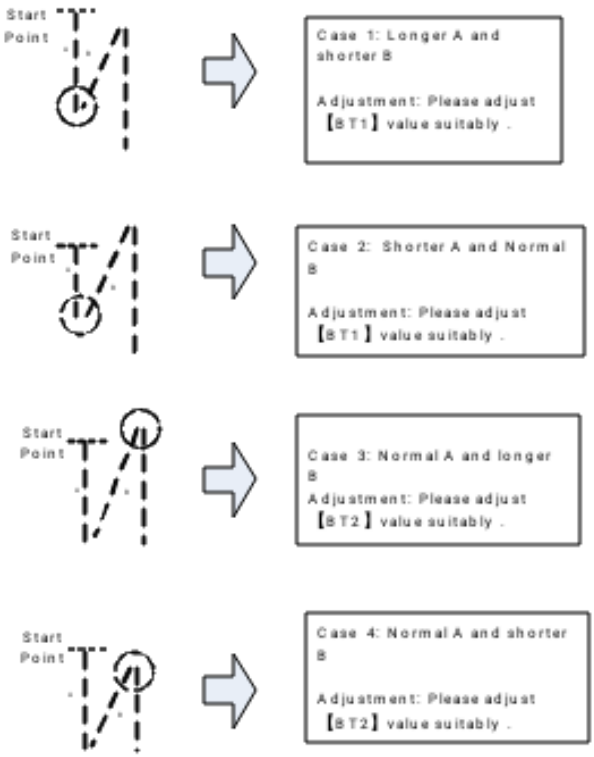


Example： Step 1: Setting stitch number for Start Back-Tacking A and B=3

Step 2: Sewing the pattern in normal speed

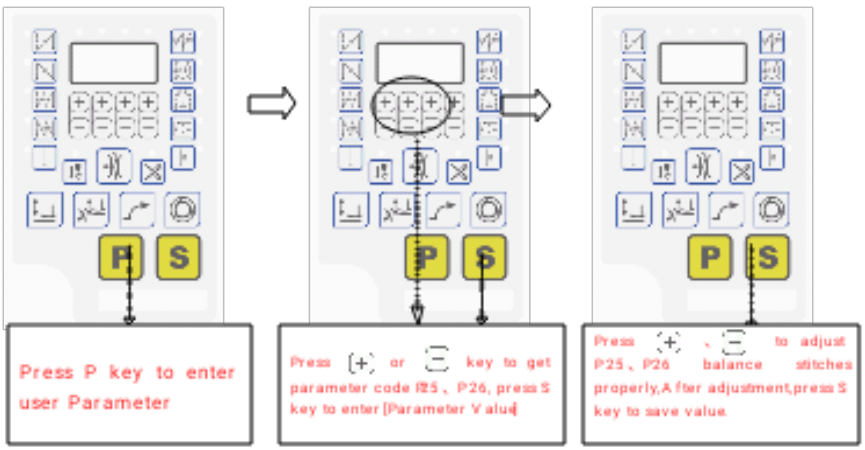
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section A before selecting for B



1.2.5.2How to Balance Stitches for 【End Back-Tacking】

Noted： Factory defaults of balance stitches for 025.BT3 and 026.BT4are different because of different types of machine head.



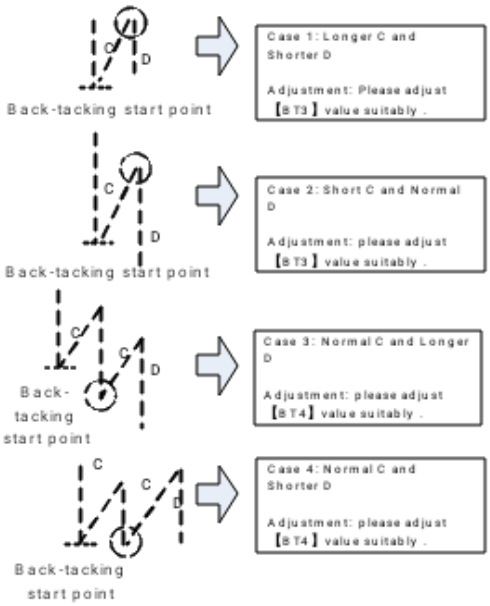
Example：

Step 1: Setting stitch number for End Back-Tacking C and D=3

Step 2: Sewing the pattern in normal speed

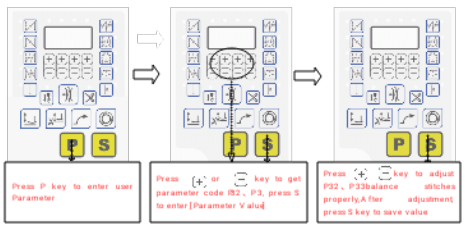
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section C before selecting for D



1.2.5.3 How to Balance Stitches for 【Bar Tacking】

Noted : Factory defaults of balance stitches for 032.BT5 and 033.BT6 are different because of different types of machine head.

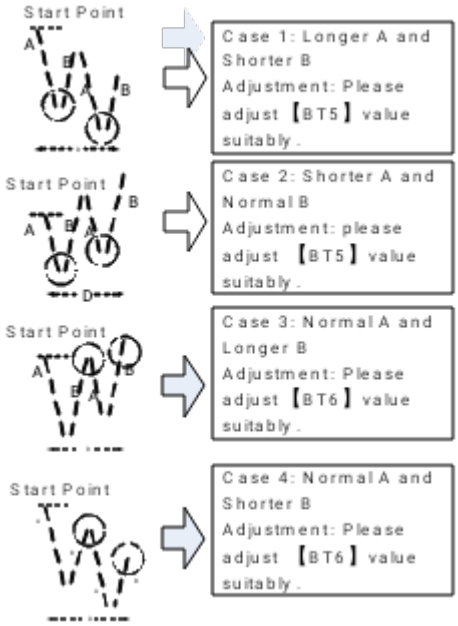


Example： Step 1: Setting stitch number for Bar-Tacking A=B= 4 and turns of Bar-Tacking D=4

Step 2: Sewing the pattern in normal speed

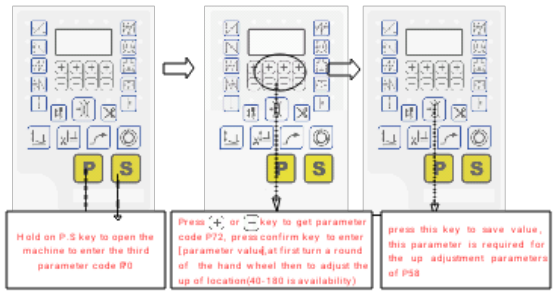
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section A(1.3) before selecting for B(2.4)

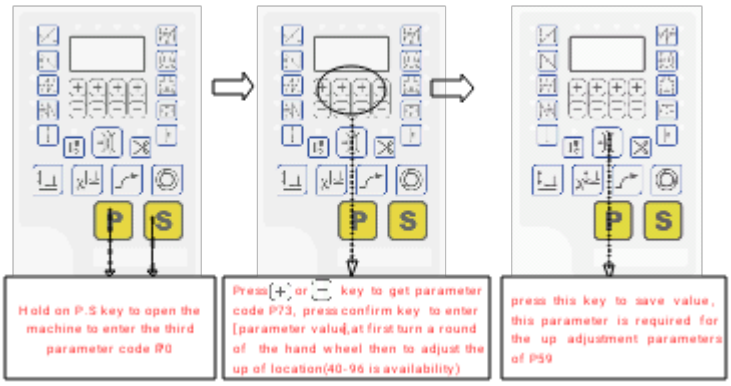


1.2.6 Manual setting the location

1.2.6.1 Manual setting the up of location



1.2.6.2 Manual setting the down of location



1.2.7 Digital types Operation

1.2.7.1Comparison Table of LCD Display Fonts and Actual Fonts

Arabic Numerals :

Actual	0	1	2	3	4	5	6	7	8	9
Display	0	1	2	3	4	5	6	7	8	9

1.2.7.2 Digital Display on the Key Board:

English Alphabet

Actual	A	B	C	D	E	F	G	H	I	J
Display										
Actual	K	L	M	N	O	P	Q	R	S	T
Display										
Actual	U	V	W	X	Y	Z				
Display										

2：User Parameter &Technician Parameter

2.1 User Parameter

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
P01	Maximum Sewing Speed (spm)	100 ~ 3700	3700	⊕⊖	Constant-Stitch sewing speed【034.SMP】is set at A(or when one shot signal is active)
P02	Speed Curve Adjustment (%)	1 ~ 100%	80	⊕⊖	The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)
P03	Needle UP/ DOWN	UP / DN	DN	⊕⊖	Press Back-Tacking switch by hand: J ： JUKI Mode (it will activate when machine is stopped or running) B ： BROTHER Mode (It will activate only the machine is running)
P04	Start Back-Tacking Speed (spm)	200 ~ 2200	1800	⊕⊖	Start Back-Tacking, reverse solenoid action: A ： One shot to pedal, it will automatic execute Start Back-Tacking. M ： Pedal-controlled and motor can stop arbitrarily
P05	End Back-Tacking Speed (spm)	200 ~ 2200	1800	⊕⊖	CON ： At the end of Start Back-Tacking, machine continues sewing if pedal pressed or START signal on (standing operation) STP ： At the end of Start Back-Tacking, machine stops
P06	Bar-Tacking Speed (spm)	200 ~ 2200	1800	⊕⊖	Constant-Stitch sewing speed【034.SMP】is set at A(or when one shot signal is active)
P07	Soft Start Speed (spm)	200 ~ 1500	400	⊕⊖	The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
P08	Stitch Numbers for Soft Start (SLS)	0 ~ 99	4		Press Back-Tacking switch by hand: J : JUKI Mode (it will activate when machine is stopped or running) B : BROTHER Mode (It will activate only the machine is running)
P09	Automatic Constant-Stitch Sewing Speed (spm)	200 ~ 4000	3700		Start Back-Tacking, reverse solenoid action: A : One shot to pedal, it will automatic execute Start Back-Tacking. M : Pedal-controlled and motor can stop arbitrarily
P10	Automatic End Back-Tacking Sewing(Can invalidate the stitch correction function)	ON / OFF	ON		CON : At the end of Start Back-Tacking, machine continues sewing if pedal pressed or START signal on (standing operation) STP : At the end of Start Back-Tacking, machine stops
P11	Back-Tacking Mode Selection	J / B	J		Constant-Stitch sewing speed【034.SMP】is set at A(or when one shot signal is active)
P12	Start Back-Tacking Mode Selection	A / M	A		The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)
P13	Mode Selection at the end of Start Back-Tacking	CON / STP	CON		Press Back-Tacking switch by hand: J : JUKI Mode (it will activate when machine is stopped or running) B : BROTHER Mode (It will activate only the machine is running)
P14	Soft Start	ON / OFF	OFF		Add with full-function operation panel is valid. ON : Soft start function is turn on. OFF: Soft start function is turn off.
P15	Setting Stitches A of Start Back-Tacking	1 ~ 15	3		Valid only when operation panel disconnected and【014.SBT】must set 【ON】 Start Back-Tacking Stitches Setting of A B Segment.
P16	Setting Stitches B of Start Back-Tacking	1 ~ 15	3		
P17	Setting Turns of Start Back-Tacking	1 ~ 4	2		Valid only when operation panel disconnected and【014.SBT】must set 【ON】 Setting the seam times of Start Back-Tacking
P18	Stitch Balance for Start Back-Tacking 1	0 ~ 31	1		①0 ⟶ 15The action gradually delay ②16 ⟶ 31The action gradually advance ③The action of 0 delay than 16
P19	Stitch Balance for Start Back-Tacking 2		10		
P20	Mode Selection for End Back-Tacking	A/M	A		End Back-Tacking, reverse solenoid action: A : Pedal full heeling ,it will automatic execute end Back-Tacking M : Pedal-controlled and motor can stop arbitrarily
P21	End Back-Tacking Function Selection	ON / OFF	ON		Valid only when operation panel disconnected ON: End Back-Tacking function is turn on. OFF: End Back-Tacking function is turn off.
P22	Setting Stitches C of End Back-Tacking	1 ~ 15	3		Valid only when operation panel disconnected and【021.EBT】must set on 【ON】 End Back-Tacking Stitches Setting of C D

P23	Setting Stitches D of End Back-Tacking	1 ~ 15	3		Segment.
P24	Setting Turns of End Back-Tacking	1 ~ 4	2		Valid only when operation panel disconnected and 【021.EBT】must set on 【ON】 Setting the seam times of End Back-Tacking
P25	Stitch Balance for End Back-Tacking 3	0 ~ 31	1		①0 ⟶15The action gradually delay ②16⟶ 31The action gradually advance ③The action of 0 delay than 16
P26	Stitch Balance for End Back-Tacking 4		10		
P27	Adding 1 Stitch to C Segment of End Back-Tacking	0 / 1	1		Adding 1 Stitch to C Segment of End Back-Tacking ON: Valid OFF: Invalid
P28	Mode Selection for Bar-Tacking	A/M	A		Bar-Tacking, reverse solenoid action: A : One shot to pedal, it will automatic execute Bar-Tacking. M : Pedal-controlled and motor can stop arbitrarily
P29	Tata curve half-board	100	20~220		Half-pedal stroke adjustment
P30	Setting Stitches of Bar-Tacking	1 ~ 99	4		Valid only when operation panel disconnected and 【029.BAR】must set【ON】 Bar-Tacking Stitches Setting
P31	Setting Turns of Bar-Tacking	1 ~ 15	4		Valid only when operation panel disconnected And 【029.BAR】must set【ON】 Setting the turn times of Bar-Tacking
P32	Stitch Balance for Bar-Tacking 5	0 ~ 31	1		①0 ⟶15The action gradually delay ②16⟶ 31The action gradually advance ③The action of 0 delay than 16
P33	Stitch Balance for Bar-Tacking 6		10		
P34	Mode Selection for Constant-Stitch Sewing	A / M	M		A : One shot to pedal, it will automatic execute Constant-Stitch M : Pedal-controlled and motor can stop arbitrarily
P35	Constant-Stitch Sewing Function Selection	ON / OFF	OFF		Valid only when operation panel disconnected ON: Constant-Stitch Function is turn on. OFF: Constant-Stitch Function is turn off.
P36	Setting Stitches for Section P1 of Constant-Stitch Sewing	1 ~ 250	00		Valid only when operation panel disconnected And 【035. PM】must set【ON】 (The stitch number for section P1 ~ P4 is set at 15 stitches of factory defaults)
P37	Wiper Function Selection or Thread Clamp Pressure Setting	ON / OFF (0—10)	ON (7)		0 : No Action 1: Wiper Action 2-11: Thread Clamp action and the pressure gradually increased)
P38	Trimmer Function Selection	ON / OFF	ON		ON : Trimmer Valid OFF: Trimmer Invalid
P39	Presser Foot UP / Down at intermediate stop	UP / DN	DN		UP : Presser foot goes up automatically DN : Presser foot keeps down (Controlled by heeling pedal)
P40	Presser Foot UP / Down after Trimming	UP / DN	DN		UP : Presser foot goes up automatically DN : Presser foot keeps down (Controlled by heeling pedal)
P41	Display the sewing finished quantity	0 ~ 9999	0		Counting the finished-sewing quantity

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
P42	Sewing Speed Display		0		Displaying the current sewing speed (the speed only for reference)
P43	Setting Direction of Motor Rotation	CW / CCW	CCW		CW：Clockwise CCW： Counter Clockwise （Viewed from motor shaft side）

2.2 Technician Parameter

Parameter Code	Parameter Function	Range /unit	Default	KEY	Description
P44	Machine's Pulley Dimension（mm）	50 ~ 200	15		Setting machine pulley size
P45	Motor's Pulley Dimension（mm）	50 ~ 150	65		Setting motor pulley size
P46	Motor stops with a reverse angle after trimming	ON / OFF	OFF		ON：It will automatic as reverse function after trimming (angle adjustment according to the parameter【047.TR8】 OFF：No Function
P47	Adjustment of reverse angles after trimming	50 ~ 200	160		Adjusting at reverse direction after trimming
P48	Low (Positioning) Speed（spm）	100 ~ 500	210		Setting Positioning Speed
P49	Trimming Speed（spm）	100 ~ 500	300		Adjusting trimming speed
P50	Presser foot lift time (ms)	10 ~ 990	120		Presser foot lift action when adjustments
P51	Duty-Cycle Setting for Foot Lifter（%）	10 ~ 90	30		Adjustment for Duty-Cycle of Foot Lifter (Fine tuning can reduce the over-heating)
P52	Time to put the foot pressure	10 ~ 990	120		When placed under the presser foot adjustments
P53	Cancel Foot Lifting when Half-Heeling the Pedal	ON / OFF	ON		ON：Pedal half heeling without foot lifting function. OFF：Pedal half heeling with foot lifting function
P54	Trimming Time（ms）	5 ~ 100	10		Trimming sequence time setting
P55	Setting Wiper Timing（Clamp action angle）	1-360（10 ~ 990）	380（50）		Wiper sequence setting（Clamp position angle of release）
P56	Needles Goes Up Automatically as Power turned on	ON / OFF	ON		ON：Power turned on, needle goes up position automatically OFF：No Function.
P57	Protection time for foot lifter（S）	1 ~ 120	10		It will automatic come down when foot lifter keep lift over the setting time.
P58	Up Position Adjustment	40 ~ 180	40		Up Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value increased.
P59	Down Position Adjustment	40 ~ 180	50		Down Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value

Parameter Code	Parameter Function	Range /unit	Default	KEY	Description
					increased.
P60	Testing Speed (spm)	100 ~ 7500	2000		Setting testing speed.
P61	Testing A	ON / OFF	OFF		Option of Testing A, after setting press 【060. TV】to set the speed keep running.
P62	Testing B	ON / OFF	OFF		Option of Testing B, after setting press 【060. TV】to set the speed execute the cycle of Start – Sewing –Stop - Trimming
P63	Testing C	ON / OFF	OFF		Option of Testing C, after setting press【060. TV】to set the speed execute the cycle of Start – Sewing –Stop without positioning function
P64	Running Time of Testing B and C	1 ~ 250	20		Setting running time of testing B and C
P65	Stop Time of Testing B and C	1 ~ 250	20		Setting stop time of testing B and C
P66	Machine Protection Switch Testing	0~2	1		0：Disable，1：Testing zero signal，2：Testing positive signal
P67	Trimming Protection Switch Testing	ON / OFF	OFF		OFF：Disable，ON：Enable

2.3 The material of thin and middle thick

The parameter of the Thread Wiper and Clamp					
P27	Light and heavy-weight materials Selection	0 / 1	0		1: Light-weight materials 0: Heavy-weight materials
P48	Low (Positioning) Speed (spm)	100 ~ 500	500		Setting Positioning Speed, it is adjusting to higher when the cloth is thicker
P49	Trimming Speed (spm)	100 ~ 500	350		Adjusting trimming speed, it is adjusting to higher when the cloth is thicker

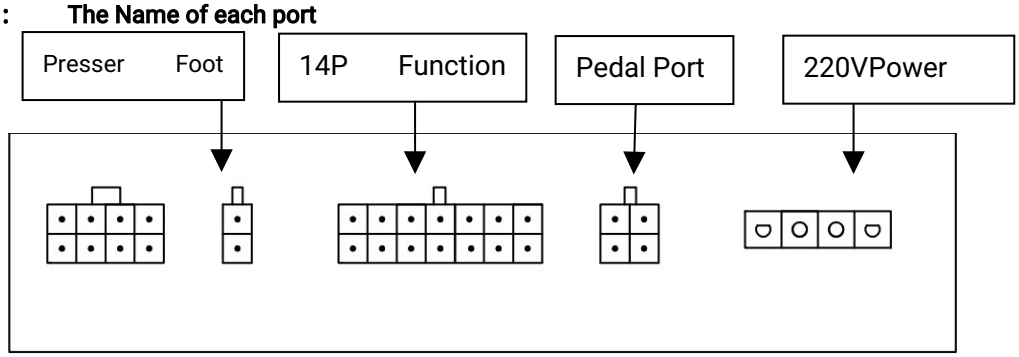
3： Error Code List

Error Code	Problem	STATUS / MEASUREMENT
E1	Power Module is faulty. Abnormal over current or voltage. Resistor is damaged or F1 fuse is blown.	System will be shut down until the power resets on. Please check the power board in detail.
E2	1) When power on, detected main voltage too low 2) Connect the wrong voltage, too low.	Moto and machine will be shutting down. Please check the AC power. (Too low) Please check the main pc board.

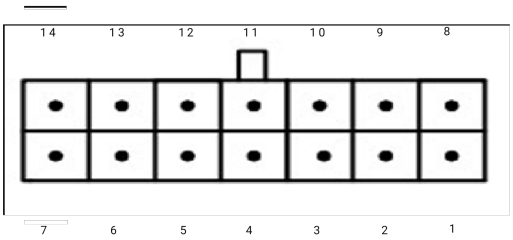
E3	Operation Box linked to CPU interface had communication error.	Motor and machine will be shutting down. Please check the operation box.
E5	The connection of the Foot Pedal error	Motor and machine will be shutting down. Please check the connection of the Foot Pedal or the problem of it
E7	a) Bad connection at the motor connector. b) Synchronizer signal error c) Machine locked or object stuck in the motor pulley. d) Sewing material is too thick. e) Module output is abnormal.	Motor and machine will be shutting down. Please check the motor connectors, synchronizer situation and machine situation.
E8	Manual Back-Tacking lasts for 15 sec.	Motor and machine will be shutting down until the power resets on.
E9	Synchronizer signal error.	Please check the positioning signal or the condition of pulley.
E11	Auto Needle Up is malfunction as power on.	Motor still can run, but it automatically starts the clutch mode. All constant-stitch sewing pattern and trimmer /wiper function is invalid. Please check the synchronizer.
E12	Power is turned on without the synchronizer signal.	Motor still can run, but it automatically starts the clutch mode. All constant-stitch sewing pattern and trimmer /wiper function is invalid. Please check the synchronizer.
E13	Overheat Protection f or Power Module	Please check the connection between power module and heat sink.
E14	Encoder signal error.	Please check the encoder signal or change the encoder.
E15	Abnormal over current protection for Power Module.	System will be shut down until the power resets on. Please check the power board in detail.
E17	Trimmer switch error.	Please check the trimmer switch whether turn in the correct position.

4 : Port Outline Diagram

4.1 : The Name of each port



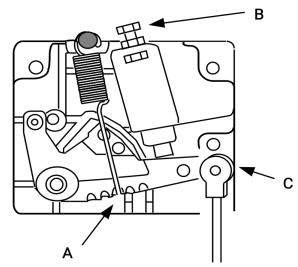
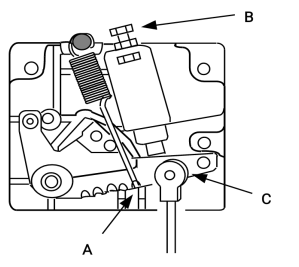
4.2 : 14P Function Port Table



①Trimming Solenoid：1、8
②Clamp, dial line solenoid：2、9
③Clothing lights：4（Signal ground）、11（+5v）
④Backstitch manually switch：5（Sensor signal）、12（Signal ground）
⑤Backstitch solenoid：6、13
⑥Complement Needle switch：7（Sensor signal）、14（Signal ground）

5 Installation

5.1 Adjust The Force Required To Operate The Foot Pedal

For General Application	For Venturi Device Attached
	

Spring A: Downward force adjustment

Bolt B: Heeling back force adjustment

Hole C： Pedal stroke adjustment

∴ In case of connecting with an air switch on the pedal rod to activate a Venturi Device, please shift the position for A and C as shown below.

5.2 Installation instruction of integration electric control

1）Put the matched motor②install to the machine body, pay attention to the outgoing line towards the machine end cover direction and fixed with motor all position screw.

2） Put out the assembled integration electric control③Put the M5×20 screw with flat washer installed in the electric control box on the top of screw holes, and then put the screw mounted on O-ring.

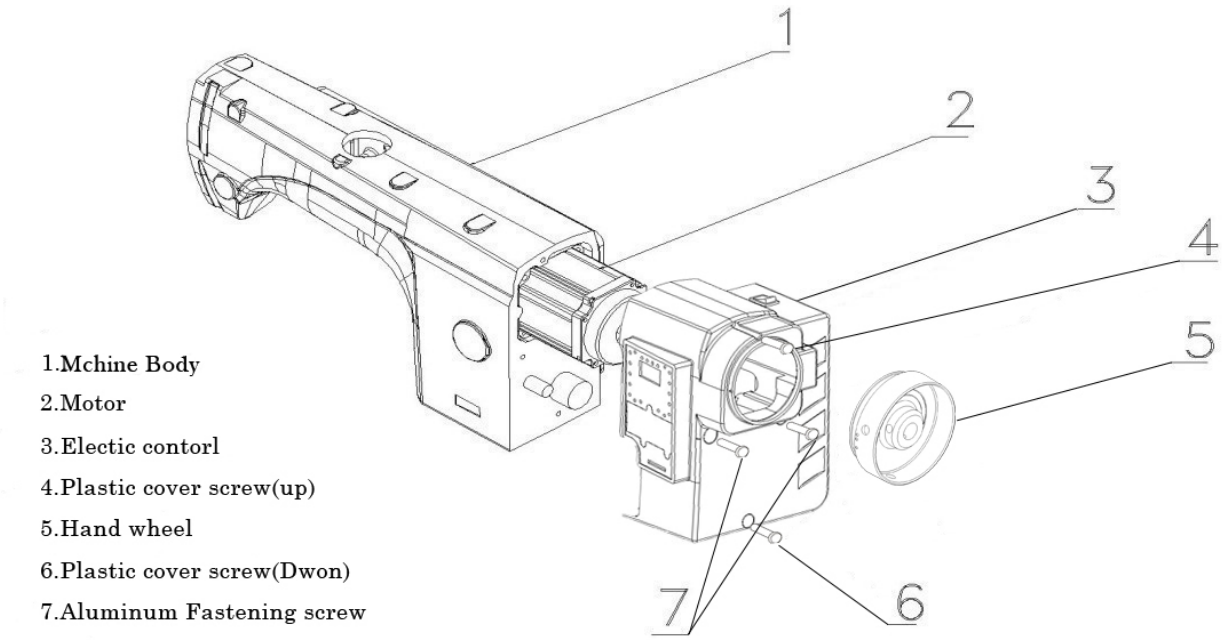
3）Put the motor encoder line connect with electric control；put motor power plug connect to the electric control

4）Adjust power cord and encoder line around the motor, put the electric control into motor close to the end of the machine body plane.

5）Use long-handled hex wrench put the screw ⑦ through electric hole matched with machine body screw hole.

6）Use long-handled hex wrench mount on screw ④ through plastic screw hole and matched with machine body hole.

7) Use long-handled hex wrench mount on screw ⑥ through plastic screw hole and matched with machine body hole,.
8) Adjust electric control position match with appearance of machine body, tightened screw ④,⑥, then tightened screw ⑦
9) Assembly hand wheel⑤, open machine to test.



1.Mchine Body
2.Motor
3.Electic contorl
4.Plastic cover screw(up)
5.Hand wheel
6.Plastic cover screw(Dwon)
7.Aluminum Fastening screw