

AC 伺服马达
AC SERVO MOTOR

中捷一体化多功能

ZOJE 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）。

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1：操作说明

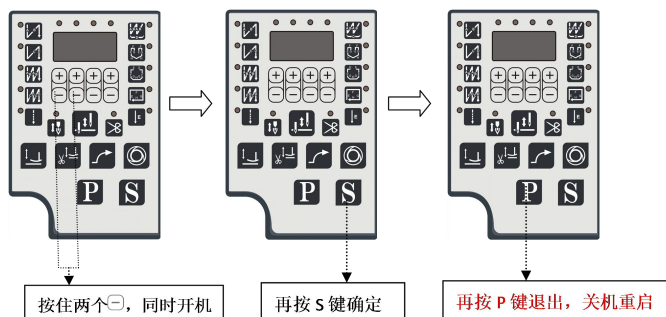
1.1： 按键说明

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。

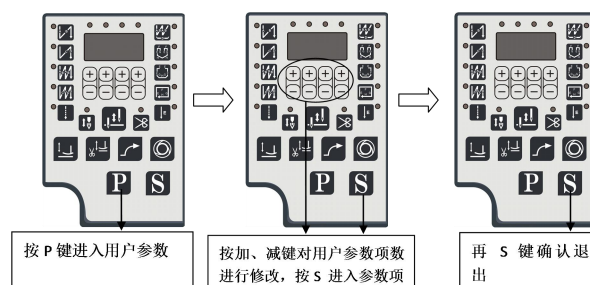
提针 / 补针		连续回缝除外，任何一种车缝中途停止时，按一下则作提针或往前补半针。任何一种车缝终止未切线时，按一下则作提针或往前补半针。
触发自动 (AUTO)		1.在自由缝的式样中：按下此键无功能，LED 灯亦不亮。 2.在定针缝的式样中按下此键： 当踏板一经往前踏下触发，则自动执行 E, F 段或 G, H 段中所设定的针数，直到段内针数完成后自动停止。 再逐一触发踏板，则自动执行下一段所设定的针数直到自动完成切线、扫线等动作为止。 相应 LED 灯不亮时，表示关闭相应功能。
切线开关		1.设定使用或取消切线功能。 2.相应 LED 灯不亮时，表示关闭相应功能。
进入参数区功能键		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、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、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

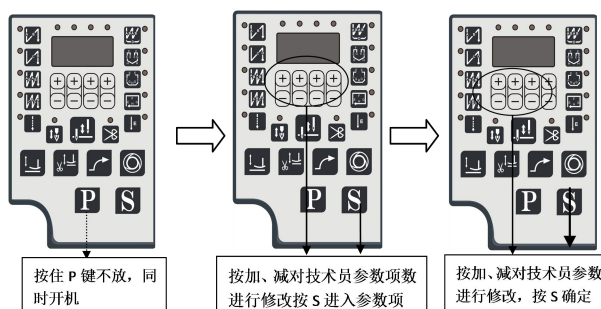
1.2.1 恢复出厂设置



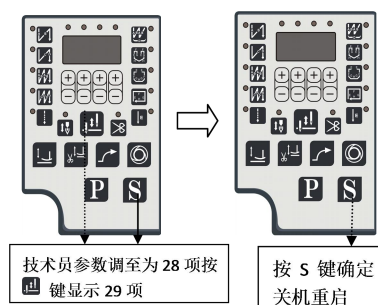
1.2.2：进入用户模式及修改



1.2.3： 进入技术员模式及修改



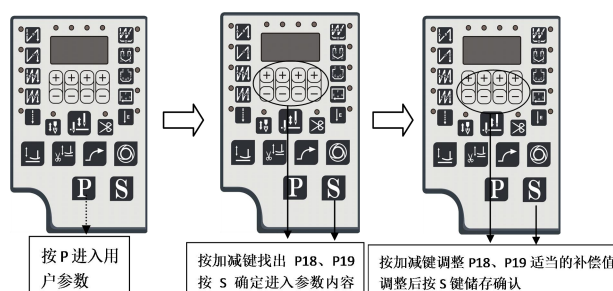
1.2.4 参数保存



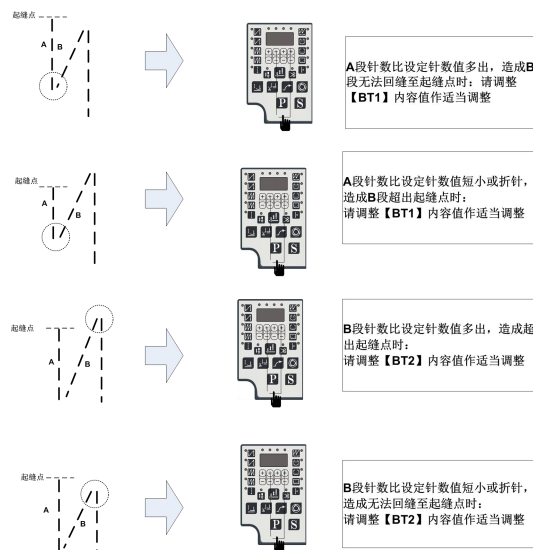
1.2.5 调整自动回缝缝迹同步平齐度的补偿

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。

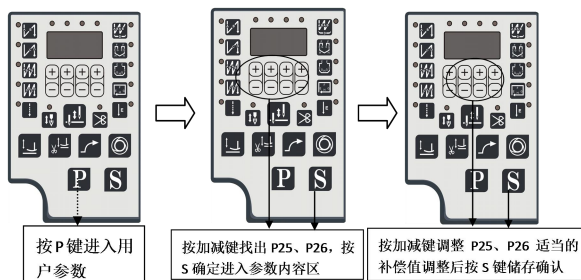


调整范例说明：假设起始回缝针数 A、B 段均设定在相同针数下（A=3 针、B=3 针）建议：请先将 A 段的补偿值设定完成后，才继续 B 段补偿值的设定步骤。



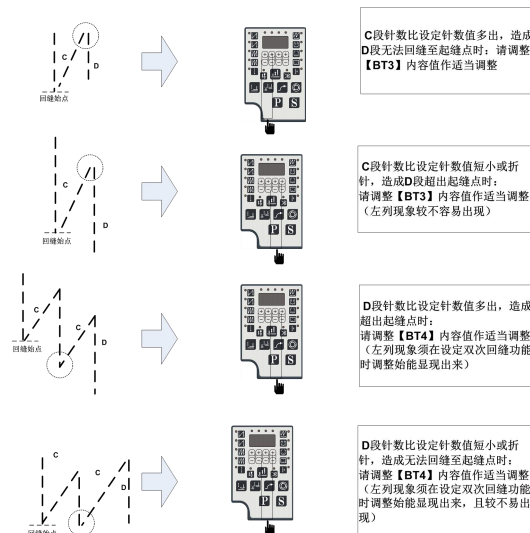
1.2.5.2 【终止回缝】的补偿部分

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



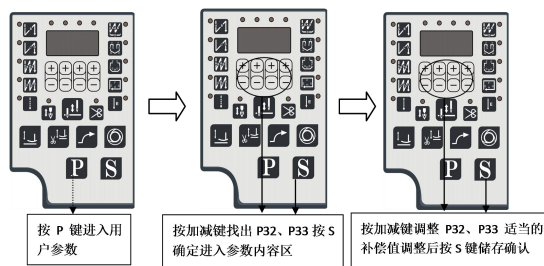
调整范例说明：假设终止回缝针数C、D段均设定在相同针数下（C=3针、D=3针）

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



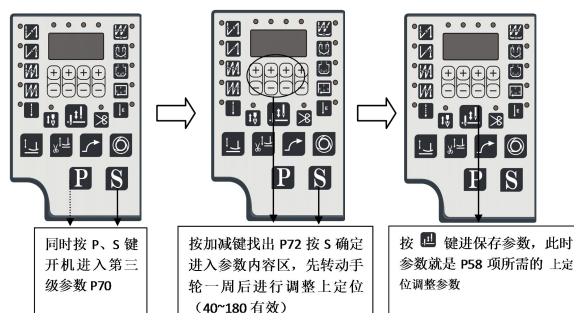
调整范例说明：假设连续回缝针数 A、B 段均设定在 4 针，而来回次数 D 设定在 4 回下

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。

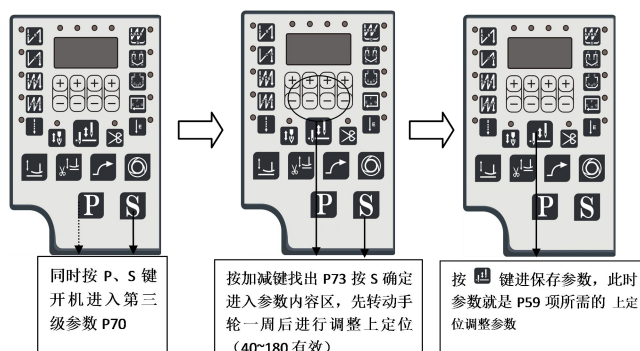


1.2.6 手动调整定位

1.2.6.1 手动调整上定位



2.6.2 手动调整下定位



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)	200~3200	2000		前段回缝 (起始回缝) 时的速度设定
P05	终止回缝速度 (spm)	200~3200	2000		后段回缝 (终止回缝) 时的速度设定
P06	连续回缝速度 (spm)	200~3200	2000		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。 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	慢速启动开关	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		

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
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
P19	起始回缝补偿 2		8		
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
P26	终止回缝补偿 4		8		
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	连续回缝功能选择	ON / OFF	OFF		在无外加选针盒下始有效 ON：连续回缝功能开启 OFF：连续回缝功能关闭
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
P33	连续回缝补偿 6		8		
P34	定针缝运动模式选择	A / M	A		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

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
P36	定针缝段数选择 P1	1~250 针	00		【035. 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）	0~-11	1		0：无动作 1 为拨线动作 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。
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【047.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	230		定位速度设定
P49	切线速度（spm）	100~350	300		调整切线周期时的电机速度
P50	压脚全额初始出力的动作时间（ms）	10~990	250		压脚开始动作时，全额出力的动作时间
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	延迟马达起动，保护压脚下放时间	10~990	120		踩下时延迟起动时间，以配合压脚放下之确认
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

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
P54	切线动作时间 (ms)	10~990	10		切线时序所需的动作时间
P55	拨 / 扫线 (或吹风)动作时间/(夹线器动作角度)	10~990 (1-360)	30 (270)		拨 / 扫时序的动作时间 (夹线器松开定位角度)
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	5		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【060. 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【060. 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【060. 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
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

2.3 夹线方面的参数:

夹线方面的参数					
P37	(夹线器力度设置)	(0—11)	(8)		(0 无夹线动作) (1-10 力道逐步增大)
P55	夹线器松开动作角度	(1-360)	(270)		夹线器松开定位角度
P69	夹线器启动动作角度	1-360	100		夹线器启动时定位角度

2.4 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

注：修改 P27 之后需要进行参数保存。

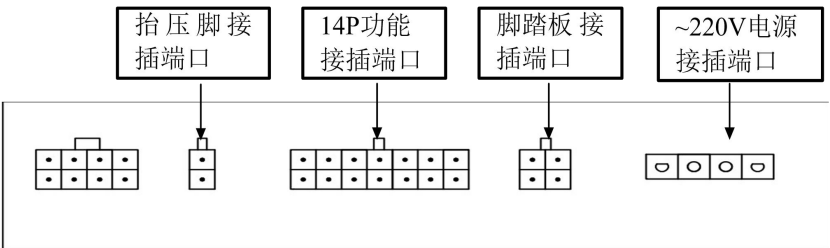
3：错误代码表

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。。

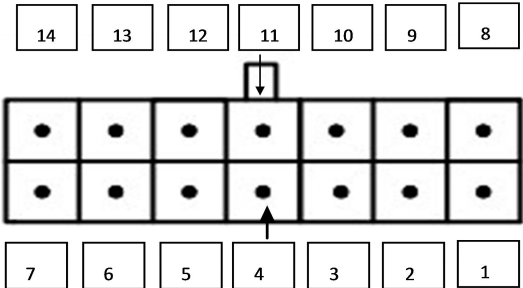
E11	电源开启即自动找上定位,但定位器有插入控制箱,针上信号无法输出。	自动进入无定位器模式,且切线、扫线、上定位等以及所有定针缝样式缝制功能亦无效。 马达可正常操作。 (请检查定位器是否异常)。
E12	电源开启时,未插入定位器。	自动进入无定位器模式运作,且切线、扫线、上定位等以及所有定针缝样式缝制功能亦无效。 马达可正常操作。 (请检查定位器是否忘记插入或异常)
E13	电力模块过热保护	检查电力模块与散热片是否接触良好。
E14	编码器信号异常	检测编码器信号是否正常,或更换编码器。
E15	电力模块不正常过流保护	模块驱动出力与机头出力将全部关闭。 等待电源重新开启/复位。 (请仔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



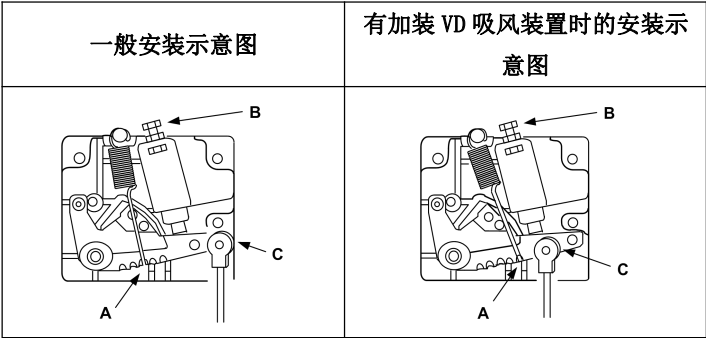
剪线电磁铁	扫线		5V 衣车灯	手动倒缝	倒缝电磁铁	抬压脚
1	2	3 (无作用)	4 (地)	5	6	7
8	9	10 (地线)	11 (+5V)	12	13	14

5 安装说明

5.1 控速器踏板拉力的调整

- 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

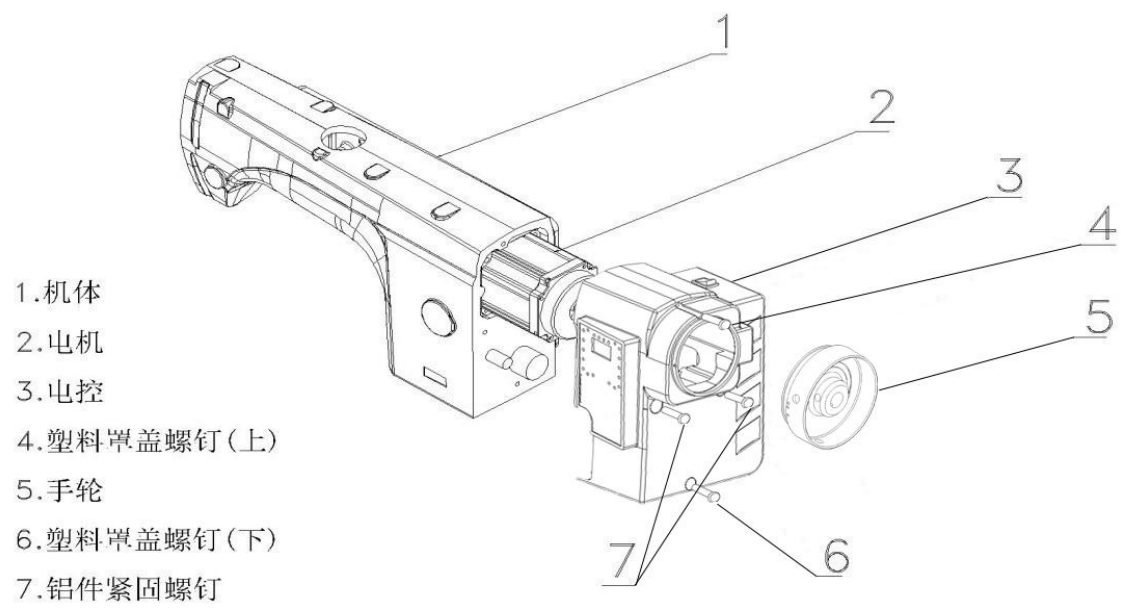


5.2 一体化电控安装操作说明

- 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) 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。
- 4) 用长柄六角扳手套上螺钉⑦穿入电孔与机体螺孔装配。
- 5) 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。
- 6) 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。
- 7) 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
- 8) 装配手轮⑤，开机测试。





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).

EC Declaration of Conformity

We hereby declare that the products are in conformity with the provision of the EC directives as following:

- EC Low Voltage Directive (73/23/EEC)
- EC Electromagnetic Compatibility Directive (89/336/EEC)
- EC Machinery Directive (98/37/EC)

Applied harmonized standards:

EN 60204-31 : Electrical equipment of industrial
Machines . Particular requirements for sewing

Machines , sewing units and sewing system.

EN 292-1: Safety of machines.

EN 292-2: Safety of machines, technical guidelines and specifications.

EN 61000-6-2: EMS for industrial environment.

EN 61000-6-3: EMI for residential environment.

Declaration of Conformity for Concentration Limits for Certain Hazardous Substances

We hereby declare that the products are complies with the following directives and requirements:

1. European Union RoHS Directive (2002/95/EC) and the concentration limits for certain hazardous substances (2005/618/EC)

2. People's Republic of China Electronic Business Standard:

Requirements for concentration limits for certain hazardous substances in electronic information products (SJ/T 11363-2006)

Our product itself (motor, control box) or its packing materials and accessories (box, screws package, user manual, sticker, label, print...etc.) or the suppliers of parts and raw materials are all in conformity with the provision of the European Union RoHS Directive and People's Republic of China Electronic Business Standard to conform the following concentration limits for the six hazardous substances:

Hazardous Substance	Permissible Values
Lead (Pb)	Less than 240ppm
Mercury (Hg)	Less than 800ppm
Cadmium (Cd)	Less than 80ppm
Hexavalent chromium (Cr VI)	Less than 800ppm
Polybrominated Biphenyl (PBB)	Less than 800ppm
Polybrominated Diphenyl ether (PBDE)	Less than 800ppm

*** The concentration of lead in the lead-free process for PCB shall be less than 800 ppm.**

*** For packing materials shipped with our products or parts, the hazardous substances shall be 80 ppm or less in sum of Pb+Hg+Cd+Cr VI.**

- 1 Operation
 - 1.1 Key Function
 - 1.2 Debugging of integration electric control box
 - 1.2 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】**
 - 1.2.5.2 How to Balance Stitches for **【End Back-Tacking】**
 - 1.2.5.3 How to Balance Stitches for **【Bar Tacking】**
 - 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
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 - 2 User parameter & technician parameter
 - 2.1 User parameter
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 - 2.4 **Adjust the material of thin and middle thick**
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 - 4 Port Outline Diagram
 - 4.1 The name of each port
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 - 5.1 Adjust The Force Required To Operate The Foot Pedal
 - 5.2 Installation instruction of integration electric control

1: Operation

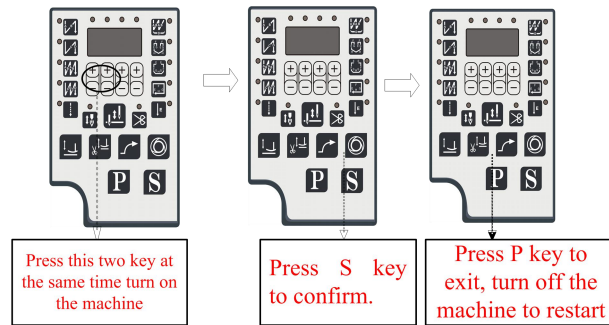
1.1: Key Function

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 S key for confirmation and save if the parameter value adjustment.
Needle up / Forward stitch correction		1. In Free sewing, one touch of the key will correct half-stitch. 2. In Constant-Stitch sewing (In bar-tacking sewing, it acts as needle up.) If sewing stops intermediately in one section, one touch of key will raise the needle to up position. If it stops at the end of section, one touch of key will correct one stitch forward.

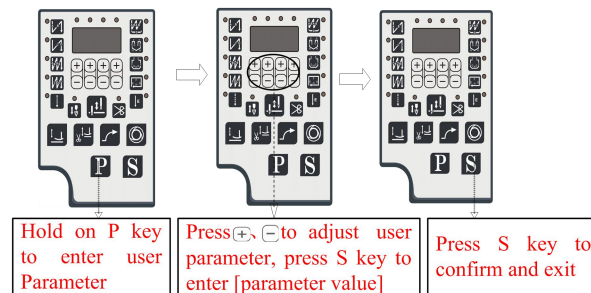
One-shot sewing selection		In Free sewing: One touch of this key makes beep sound without any function also LED does not light up: In Constant-Stitch Sewing: 1. One shot to the pedal, stitches number of E, F or G, H will be automatically performed. 2. Toe down the pedal again and again to finish the 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] (See 1.11 Parameter Table). Press and hold 【P】 key, then turn on the power to enter [Technician Parameter Mode] (See 1.11 Parameter Table).
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

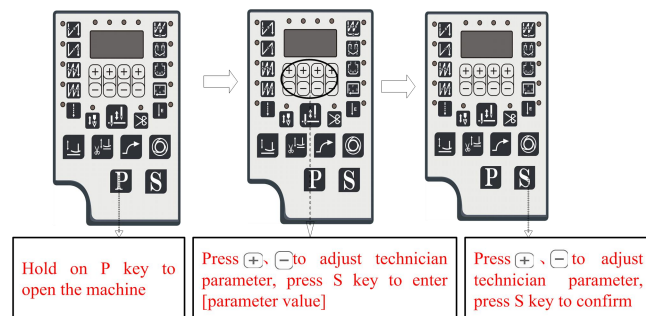
1.2.1 Restore factory setting



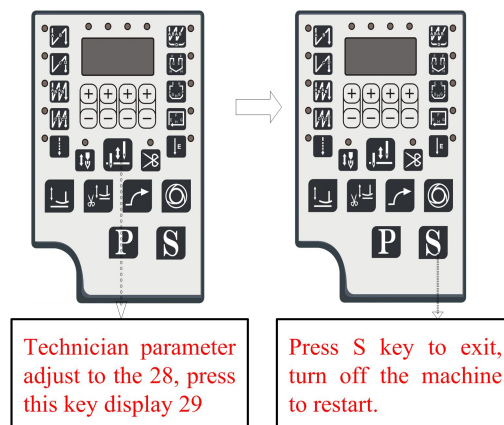
1.2.2: Enter to the user mode to changed valve



1.2.3: Enter to the technician mode to changed valve



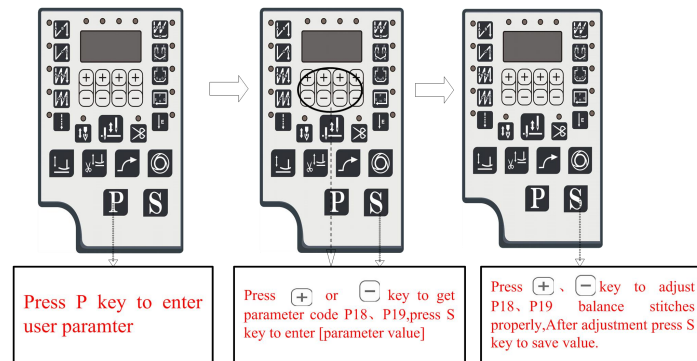
1.2.4 Save the parameter



1.2.5 Stitch Balance of Back-Tacking for Lockstitch Machine

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

Noted: Factory defaults of balance stitches for P18.BT1 and P19.BT2 are different because of different types of machine head.

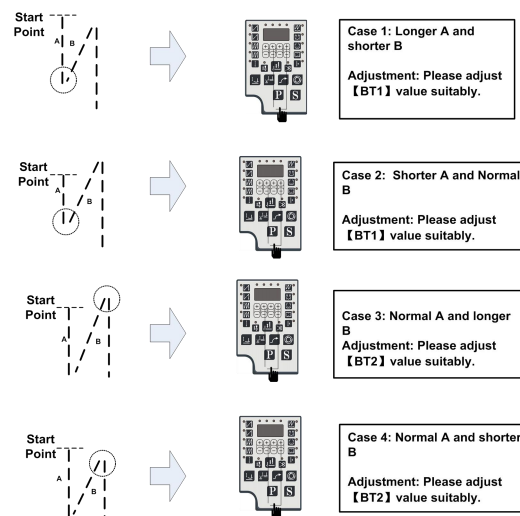


Example: Step 1: Setting stitch number for Start Back-Tacking A and B=3

Step 2: Sewing the pattern in normal speed

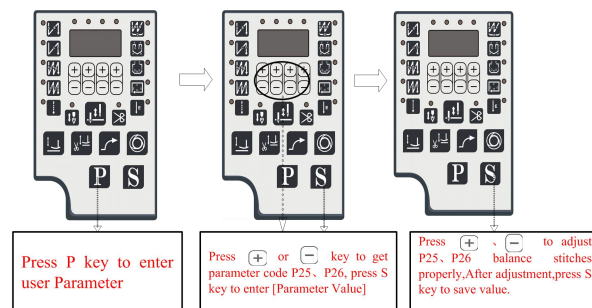
Step 3: If unbalanced situation is appeared please correct it as below:

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



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

Noted: Factory defaults of balance stitches for 025.BT3 and 026.BT4 are different because of different types of machine head.



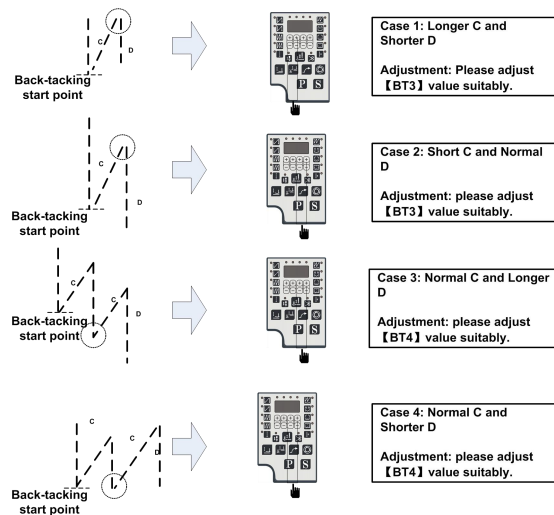
Example:

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

Step 2: Sewing the pattern in normal speed

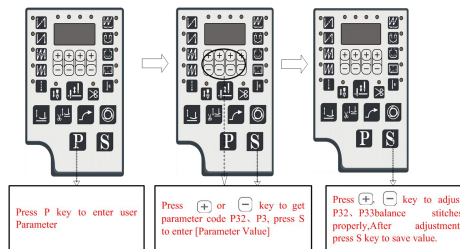
Step 3: If unbalanced situation is appeared please correct it as below:

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.

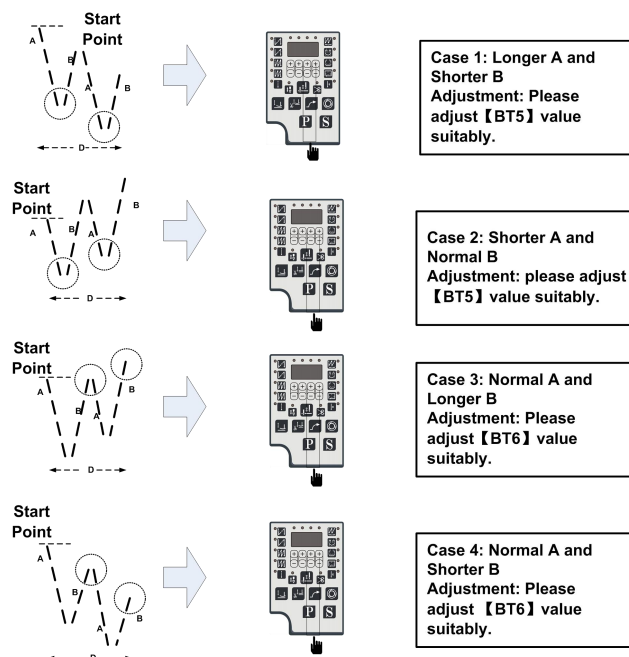


Example: Step 1: Setting stitch number for Bar-Tacking A=B= 4 and turns of Bar-Tacking D=4

Step 2: Sewing the pattern in normal speed

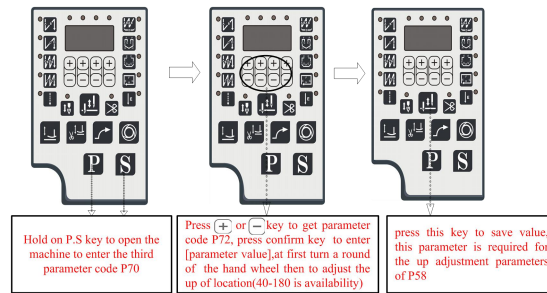
Step 3: If unbalanced situation is appeared please correct it as below:

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

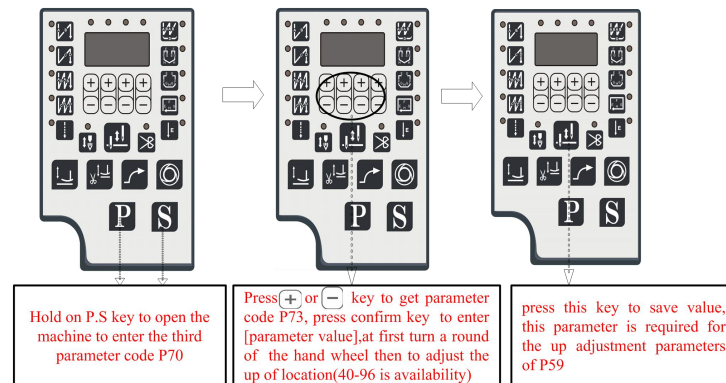


1.2.6 Manual setting the location

1.2.6.1 Manual setting the up of location



1.2.6.2 Manual setting the down of location



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		Maximum speed of machine sewing
P02	Speed Curve Adjustment (%)	1~100%	80		The Larger the value, the faster to increase speed
P03	Needle UP/ DOWN	UP / DN	DN		UP: Needle Stops at Up Position DN: Needle Stops at Down Position
P04	Start Back-Tacking Speed (spm)	200~3200	2000		Start Back-Tacking Speed Adjustment
P05	End Back-Tacking Speed (spm)	200~3200	2000		End Back-Tacking Speed Adjustment
P06	Bar-Tacking Speed (spm)	200~3200	2000		Repeat Bar-Tacking Speed Adjustment
P07	Soft Start Speed (spm)	200~1500	400		Soft Start Speed Adjustment
P08	Stitch Numbers for Soft Start (SLS)	0~99 Stitches	4		Soft Start Stitches Setting (one unit = half stitch)
P09	Automatic Constant-Stitch Sewing Speed (spm)	200~4000	3700		Constant-Stitch sewing speed 【034.SMP】 is set at A(or when one shot signal is active)

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
P10	Automatic End Back-Tacking Sewing(Can invalidate the stitch correction function)	ON / OFF	ON		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)
P11	Back-Tacking Mode Selection	J / B	J		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)
P12	Start Back-Tacking Mode Selection	A / M	A		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
P13	Mode Selection at the end of Start Back-Tacking	CON / STP	CON		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
P14	Soft Start	ON / OFF	OFF		ON: Soft start function is turn on. OFF: Soft start function is turn off.
P15	Setting Stitches A of Start Back-Tacking	1~15Stitches	3		Start Back-Tacking Stitches Setting of A B Segment. Invalid, setting by front shortcut key
P16	Setting Stitches B of Start Back-Tacking	1~15 Stitches	3		
P17	Setting Turns of Start Back-Tacking	1~4Times	2		Setting the seam times of Start Back-Tacking Invalid, setting by front shortcut key
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		8		
P20	Mode Selection for End Back-Tacking	A/M	A		
P21	End Back-Tacking Function Selection	ON / OFF	ON		ON: End Back-Tacking function is turn on. OFF: End Back-Tacking function is turn off. Invalid, setting by front shortcut key

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
P22	Setting Stitches C of End Back-Tacking	1~15 Stitches	3		【021.EBT】 must set on 【ON】 End Back-Tacking Stitches Setting of C D Segment Invalid, setting by front shortcut key.
P23	Setting Stitches D of End Back-Tacking	1~15 Stitches	3		
P24	Setting Turns of End Back-Tacking	1~4 Times	2		【021.EBT】 must set on 【ON】 Setting the seam times of End Back-Tacking Invalid, setting by front shortcut key
P25	Stitch Balance for End Back-Tacking 3	0~31	1		① 0 → 15 The action gradually delay ② 16 → 31 The action gradually advance ③ The action of 0 delay than 16
P26	Stitch Balance for End Back-Tacking 4		8		
P27	Light and heavy-weight materials Selection	0 / 1	1		
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	Bar-Tacking Function Selection	ON / OFF	OFF		ON: Bar-Tacking Function is turn on. OFF: Bar-Tacking Function is turn off. Invalid, setting by front shortcut key
P30	Setting Stitches of Bar-Tacking	1~99 Stitches	4		【029.BAR】 must set 【ON】 Bar-Tacking Stitches Setting Invalid, setting by front shortcut key
P31	Setting Turns of Bar-Tacking	1~15 Times	4		【029.BAR】 must set 【ON】 Setting the turn times of Bar-Tacking Invalid, setting by front shortcut key
P32	Stitch Balance for Bar-Tacking 5	0~31	1		① 0 → 15 The action gradually delay ② 16 → 31 The action gradually advance ③ The action of 0 delay than 16
P33	Stitch Balance for Bar-Tacking 6		8		
P34	Mode Selection for Constant-Stitch Sewing	A / M	A		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		ON: Constant-Stitch Function is turn on. OFF: Constant-Stitch Function is turn off Invalid, setting by front shortcut key.
P36	Setting Stitches for Section P1 of Constant-Stitch Sewing	1~250 Stitches	00		【035. PM】 must set 【ON】 (The stitch number for section P1 ~ P4 is set at 15 stitches of factory defaults) Invalid, setting by front shortcut key.
P37	Wiper Function Selection or Thread Clamp	0~11			0 : No Action 1 : Wiper Action

Parameter Code	Parameter Function	Range/ unit	Default	Key	Description
	Pressure Setting				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
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	230		Setting Positioning Speed
P49	Trimming Speed (spm)	100~500	300		Adjusting trimming speed
P50	Full-On Time Setting for Foot Lifter (ms)	10~990	250		Timing adjustment for Full-On time of Automatic Foot Lifter actives.
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	Running-Delay Time Setting	10~990	120		Running-Delay time adjustment for Automatic Foot Lifter
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

Parameter Code	Parameter Function	Range /unit	Default	KEY	Description
P54	Trimming Time (ms)	5~100	15		Trimming sequence time setting
P55	Setting Wiper Timing (Clamp action angle)	10~990 (1-360)	30 (270)		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	5		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 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 Parameter of the Thread Clamp

The parameter of the Thread Wiper and Clamp					
P37	Wiper Function Selection or Thread Clamp Pressure Setting	0~11	8		0 : No Action 2-11: Thread Clamp action and the pressure gradually increased)
P55	The Thread Clamp release	1-360	(270)		The positioning angle of release

	angle				
P69	Clamp start action angle	1-360	100		The positioning angle of starting clamp

2.4 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 Heavy-weight materials 0:
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

Note: after modification P27 parameters need to save.

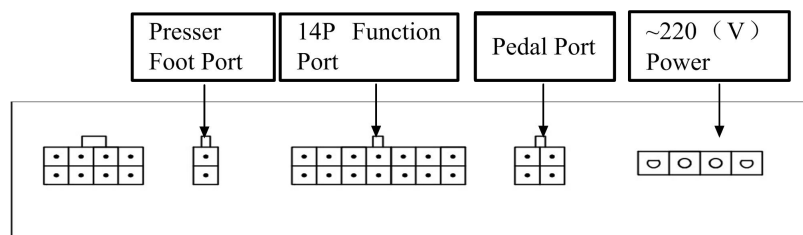
3: Error Code List

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.	Motor 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	Bad connection of speed control unit.	Motor and machine will be shutting down. Please check the speed control unit whether have loose、bad connection、or have any fault or not.
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.	System will be shut down until the power resets on. Please check the motor connectors, synchronizer situation and machine situation.

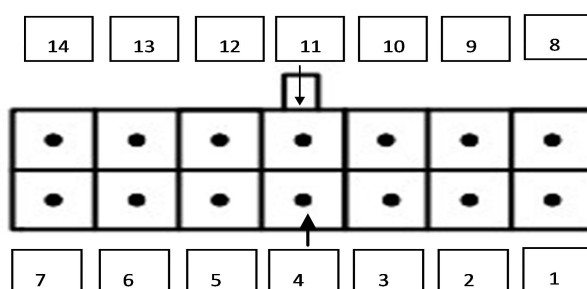
E8	Manual Back-Tacking lasts for 15 sec.	System will be shut down until the power resets on.
E9	Synchronizer signal error.	Please check the positioning signal or the condition of pulley.
E11	Auto Needle Up is malfunction as power on.	Motor still can run, but it automatically starts the clutch mode. All 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 for 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.
E16	Trimmer switch error.	Please check the trimmer switch whether turn in the correct position.
E17	Machine head switch error.	Please check if the machine head whether raised or if the machine head switch is damaged.

4: Port Outline Diagram

4.1: The Name of each port



4.2: 14P Function Port Table



Trimming Solenoid	Wiper		5V Clothes Car Light	Manual Backing-Tacking	Backing-Tacking Solenoid	Presser Foot
1	2	3 (No function)	4 (GND)	5	6	7
8	9	10 (Earth Wire)	11 (+5V)	12	13	14

5 Installation

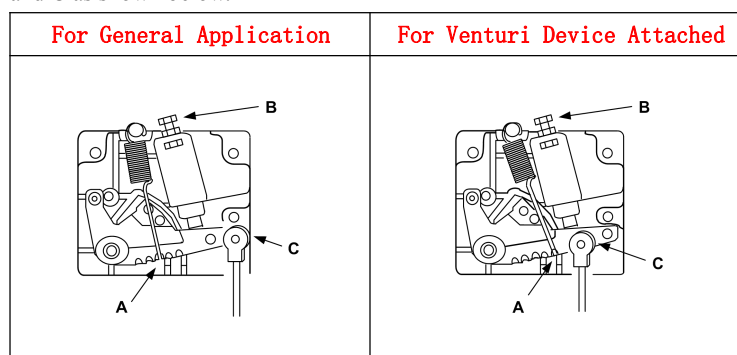
5.1 Adjust The Force Required To Operate The Foot Pedal

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.

