高速缝纫机交流伺服控制系统

SEWING AC MOTOR SERVO CONTROL SYSTEM

70T 70E2

使用说明书

USER MANUAL

为了安全地使用本产品，您在使用前仔细阅读本说明书。

In order to operate this product safely, please make sure to read this manual carefully before use.

目　　录

前言

注 意：

使用前请仔细阅读本用户手册及所搭配的缝制机械说明书，并且必须由接受过正确培训的专业人员来安装调试或操作。一旦投入使用，我们认为您已经认真阅读本手册并充分了解产品性能及使用范围。

本产品仅适用于指定范围的缝制机械，请勿移做他用。

本公司拥有此用户手册的最终解释权。

使用中若有任何疑问或对我们的产品及服务有任何意见或建议，请随时与经销商或直接与我们联系。

安全说明

1. 所有标有⚠符号的地方或指示，均为安全警示，必须特别注意并严格遵守，否则会造成人身伤害或机器损坏.
2. 所有标有⚠符号的地方或指示，均为高电压或电气方面的安全警示，必须特别注意并严格遵守，否则会造成人身伤害或机器损坏。
3. 本产品必须由受过培训的专业人员进行安装和调试。
4. ⚠配接电源时必须符合产品铭牌上标示的电压范围及技术要求，并确保本产品可靠接地。
5. ⚠接通电源时，请勿踏脚踏板。
6. ⚠本产品为精密电子产品，内含电脑控制芯片，使用地区雷击、电压变化太大或接触不良时，可能造成机器损坏，请勿使用。
7. ⚠进行以下操作时，必须切断系统电源：

■安装机器时；
■打开控制箱或在控制箱上拔出或插接任何连接插头时；
■翻抬机头、换机针或穿针线时；
■雷击、机器休息或长时间不用、修理或调整时。

8. 重新启动机器时，应相隔 30S 以上。
9. 系统参数设置或保养应由受过专门相关训练专业人员完成。
10. 所有维修用零件须由本公司提供或认可，方可使用。

1. 产品说明

1.1 概述

工业缝纫机数控交流伺服系统,采用多项高科技数字控制和交流伺服技术,多项技术及性能指标达到或超过国际先进水平.是一款适配工业高速自动平缝机的高端产品,与普通离合式电机相比,节电 40%以上,极大的提高了工业缝纫机的工作效率,降低了工业缝纫机的使用成本,提高了服装厂的竞争力。

该系统由交流伺服电机及控制器组成。

交流伺服电机采用稀土元素永磁无刷伺服电机。具有体积小、重量轻、寿命长、日功率大、噪音低、振动小、效率高、力距大、运转更平稳等特点,安装简易方便。

电控箱体采用铝合金外壳，箱体强度高、散热性更好、抗干扰能力更强，控制电路采用先进的光电分离和矢量控制技术，高速的控制芯片的采用使电机转速控制精度高，停针速度快，位置精确，操作简便。

线路板采用先进的高速贴片技术,整机供电系统采用开关电源供电，适应更宽的电压范围。具有过压、欠压、过流、各类回路短路保护等先进的故障自诊断和人机对话功能，有效防止在各种异常状态下机器故障的发生，确保控制系统正常工作。

1.2 产品使用环境

1.2.1 本产品使用请远离高频电磁波和电波发射器以免受其影响，而发生误动作。

1.2.2 产品在用环境温度要求:

a、请在室温 5℃以上或 45℃以下场所使用。

b、请不要在阳光直射的场所或室外运作。

c、请不要在暖气(电热器)旁边运作。

d、请保持工作在 30%~95%相对湿度

e、请不要在可燃气体或爆炸物附近工作

1.2.3 额定工作电压 220V±10% 50(60)HZ

1.2.4 系统接地电阻 <4Ω

1.3 产品规格

电机输出功率（Power）：400W、500W 或者 550W，可选

电机转轮直径（Motor Pulley Size）：80mm

可配置缝纫机机头转轮直径：65～130mm，缺省设置 75mm

缝制速度（Sewing Speed）：150r/min～5000r/min 可设

调速方法：无级变速，也可自动定速运行

输入信号数量（Input Signal Port）：2 路，包括手工回缝开关、安全开关

电磁铁输出信号（Solenoid Signal Output Port）：5 路，包括切线、扫线、夹线、回缝、抬压脚电磁铁驱动

故障保护：过流、超温、短路、堵转等

堵转保护判断时间：1.5 秒

1.4 基本组成及结构

1.4.1 控制箱见图 1

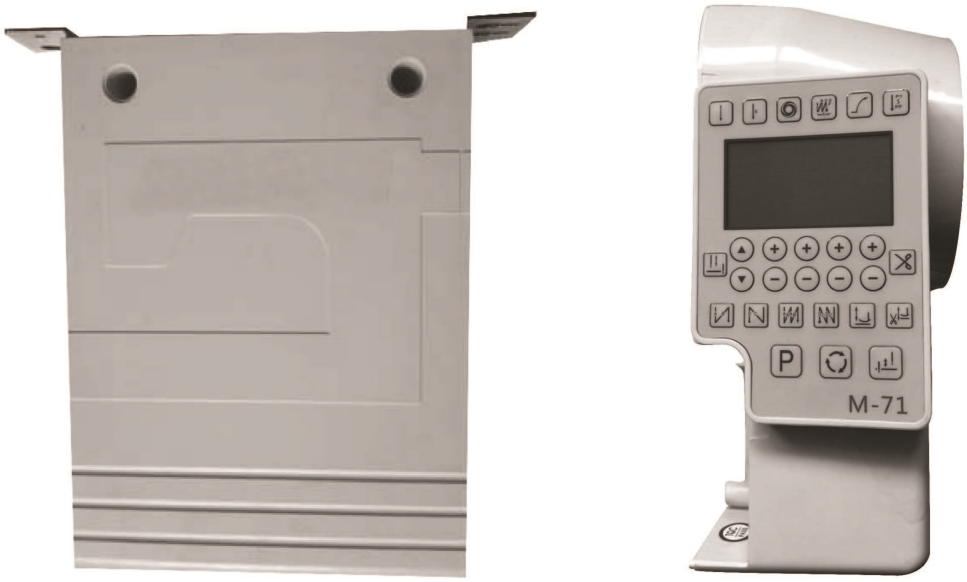

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图1

1.4.2 外置双屏操作面板如下图 2

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图2

2、安装与调整

2.1.1 操作面板安装

操作面板固定在支架上，在借用机头后窗板的两个安装螺丝位置将支架固定住。安装后如下图所示：

2.1.2 控制箱安装

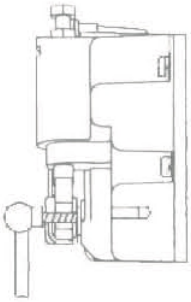
.将电控箱用自攻螺丝紧固。安装后如下图所示：

安装后效果图

2.1.3 脚踏板安装调整:

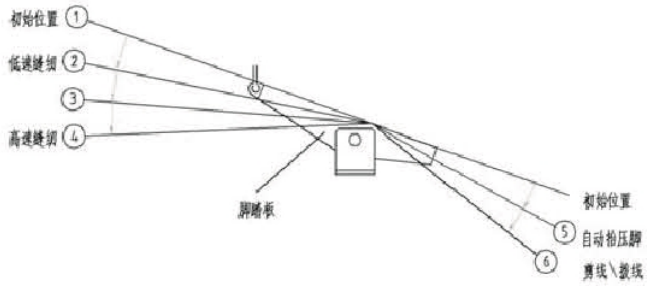
将脚踏板连杆穿入脚踏板摇臂孔内并锁紧螺母，根据实际需要调节连杆长短获得最佳踏板角度，以脚踏舒适方便最佳。

脚踏板由初始位置，至最高速位置的夹角与缝纫速度及各动作之关系见下图



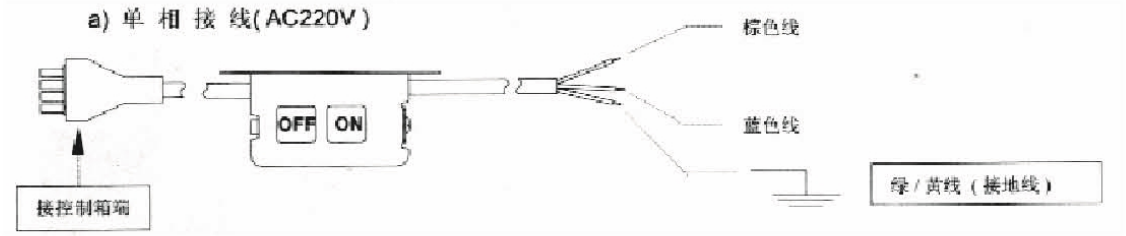
脚踏板从初始位置①向**前**踩到位置②时缝纫机开始低速缝纫,继续踩到位置④时为高速缝纫.中间为无级调速

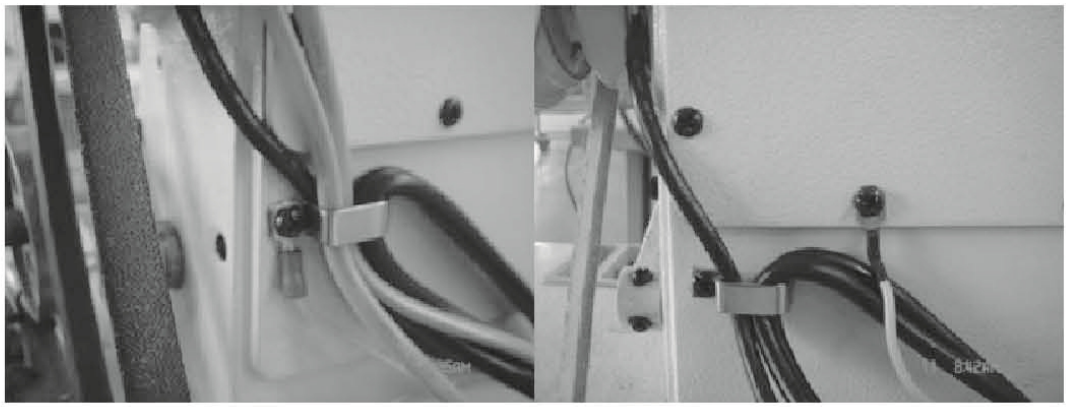
脚踏板由初始位置①向后踏到位置⑤时系统开始拔线剪线，到位置⑥时压脚自动抬升(当安装了自动抬压脚电磁铁时)针杆停至上针位



2.1.4 接线与接地

按下图连接电源线及按钮开关





注 意:

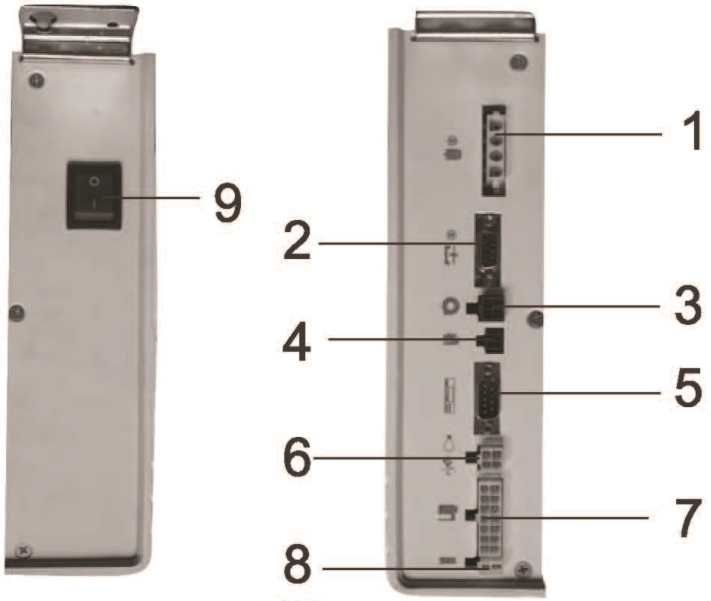
■绿黄线为接地线，一定要可靠接地,接地电阻＜4Ω

■所有电源线\信号线\接地线在接线时不要被其它物体压到或过度扭曲,不能有表皮损伤,固定时不可靠近皮带及皮带轮,并最少相距 3 厘米以确保安全.

■电源插头必须采用两相三线插座,同时用户应确保其接地线可靠接地

■**70E（M-70）控制器所用电源线为专用电源线，严禁使用其它型号控制器电源线或用于其它产品上，否则会有触电的危险！**

2.1.5 接插件插口说明：



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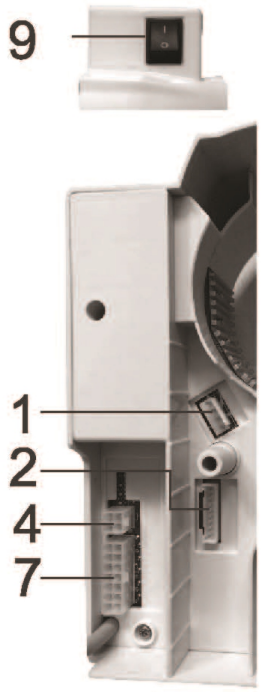

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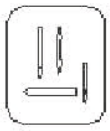
①电机插口　　②电机编码器插口
③机头定位器插口　　④脚踏开关插口
⑤操控盒插口　　⑥5V 灯和安全开关插口
⑦电磁铁插口(黄绿线为接机头接地线)
⑧夹线电磁铁插口
⑨220V电源开关
⑩电源线插口

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。

3 功能介绍

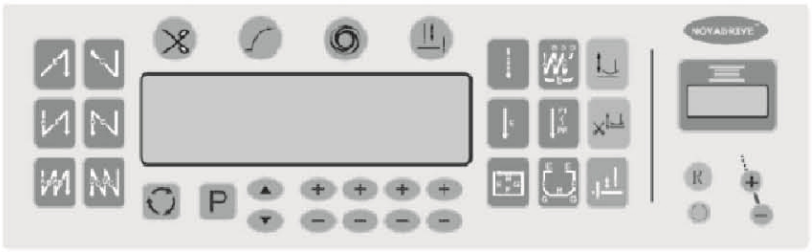
3.1 产品功能

		示意图	描述及备注
自动缝纫功能	自动剪线		当缝纫机配上切线抬压脚电磁铁后，根据用户设置自动完成相应的动作
	自动扫线	O/I	
	自动抬压脚		
	前加回缝		当缝纫机配上回缝电磁铁后根据用户的设置自动完成一次、二次、多次、回缝加固起始和终止针迹
	连续回缝		
	自动定寸缝		
	自由缝		
	后加固缝		
其他功能	定寸停针 上下停针位选择		缝纫中可选上或下定针位
	慢速启动		电机启动时会先执行慢速启动的针数后继续正常车缝
	过流.过压，堵转，断电检测等保护	具体见其故障代码	当发生过流过压，堵转断电时进行自动保护

4 基本操作

4.1 显示板的使用与操作

操作面板如下图



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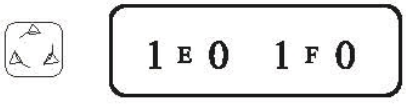
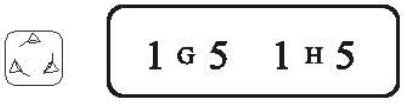
按键及功能

功能	按键	车缝动作说明
前加固缝选择		执行前加固缝（A，B 段）2 次
		执行前加固缝（A，B 段）1次
后加固缝选择		执行后加固缝（C，D 段）2 次
		执行后加固缝（C，D 段）1 次

定针缝（定寸缝）		1）.当踏板往前踩下时，就执行 E，F 段或 G 段定针缝的针数。 2）.在任何一段车缝途中，一旦踏板回到中间时，则立即停止车缝，此时当踏板再次往前踏下，则开始执行 E，F 或 G，H 段未完成的针数。 3）.当在执行完最后一段 E，F 或 G，H 段针数后则自动连贯执行终止回缝或切线，扫线等动作。 4）.当使用 P1——PF 功能时，P1——P4 段的出厂设定针数为 15，如**未**用之段，其针数必须设为 0。
自由缝		1）.一旦踏板往前踩下就正常车缝，当踏板回到中间时，立即停止车缝。 2）.当踏板往后踏时，就自动完成**剪**线，扫线等动作。
连续回缝		一旦踏板前踩下，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，中途是不会停止车缝，除非将踏板作往后踏解除动作。
针数设定选择		**A，B，C，D 等四区，其针数设定可选择从 0 到 F。（注）** **E，F，G，H 等四区，其针数设定可选择从 0 到 99。**  **表 A=B=C=D=4 针**  **表 E=F=10 针**  **表 G=H=15 针** **按此键**  **可选择切换上段 A，B，C，D 中段 E，F 下段 G，H 的针数设定与视窗显示** 在进入参数修改模式时，按  键确认保存

提针/补针		1）.在自由缝的式样中： 按一下则可做提针功能或半针往前补针动作。 （可依实际需要作连续补针动作） 2）.在定针缝的式样中：（除连续回缝功能外） a.当车缝在每段之中途停止时，按一下则只作提针。 b.当车缝在每段之终点停止时，按一下则可往前补一针。 （可依实际需要作连续补针动作）
触发自动（AUTO）		1）.在自由缝与连续缝的样式中： 按下此架蜂鸣器会声响，但无功能 LED 亦不亮 2）.在定针缝的样式能够按下此键： a. 当踏板一经往前踩下触发，即自动执行 I 段，F 段或 G，H 段中选所设定的针数，直到段内针数完成后始自动自动停止。 b. 再逐一触发踏板，即自动执行下一段所设定的针数直到自动完成切线，扫线动作为止。
剪线开关		设定使用或取消切线功能。 液晶操控盒有显示,执行**剪**线动作 液晶操控盒无显示,不执行**剪**线动作
慢速启动		1）.当此功能开启时，电机启动时会先执行慢速启动的针数后继续正常车缝。中间停止后再前踏时只会正常车缝，除非有往后踏动作后再次前踏，则电机于启动前会再先执行慢速启动。 2）.慢速启动之速度设定可由参数[6]调整。 3）.慢速启动之针数设定可由参数[7]调整。
电机停止时针停设定针上/针下		电机停止时，针停的位置 液晶操控盒有显示时，电机停止时针停上定位 液晶操控盒无显示时，电机停止时针停下定位
切完线后自动抬压脚上/下		切完线后，压脚是否动作 液晶操控盒有显示时，切完线后压脚自动抬起 液晶操控盒无显示时，切完线后压脚不动作

车缝中停止时自动抬压脚上/下		车缝停止时，抬脚是否动作 液晶操控盒有显示时，车缝中电机停止时压脚自动抬起 液晶操控盒无显示时，车缝中电机停止时压脚不动作
设定数值递增		A，B，C，D区的设定针数增加，其设定值可选择从0到F。（注） E，F，G，H区的设定针数增加，其设定值可选择从0到99。 参数选择区内当参数递增键。 参数内容区内当设定数值递增键。
设定数值递减		A，B，C，D区的设定针数减少，其设定值可选择从0到F。（注） E，F，G，H区的设定针数减少，其设定值可选择从0到99。 参数选择区内当参数递减键。 参数内容区内当设定数值递减键。
进入参数选择区/参数递增		按著此键两秒便可进入参数区。 参数区内此键可当参数递增键
底线数量恢复/底线设定键		短按一次，将当前底线数数量恢复到设定值。长按3秒，进入底线总数设定状态。
显示切换键		可以切换待调底线数的数字位。
递增键		按下递增键时，正在设定的数据在设定范围内递增。
递减键		按下递减键时，正在设定的数据在设定范围内递减。

注：选针盒 A、B、C、D 区的设定针数内英文字母所代表之针数 A=10、B=11、C=12、D=13、E=14、F=15 针

5. 功能参数表

5.1 A 功能参数表(用户使用)

开机后或剪线后，按  键 2 秒后进入用户参数设置，每修改一项参数后需按  键才能对修改的参数保存。

参数代码	参数内容	范 围	初始值	设置内容数值说明
001. H	最高转速 r/min	150～5000	3500	车缝时的最高转速设定,与机型相关
002. PSL	加速曲线调整%	1～100%	80%	控制器的加速爬升斜率设定
003. NUD	针停定位选择	UP/DN	DN	UP(上停针)/DN（下停针）
004. N	起始回缝速度 r/min	150～2800	1800	起始回缝的速度设定
005. V	终止回缝速度 r/min	150～2800	1800	终止回缝的速度设定
006. B	连续回缝速度 r/min	150～2800	1800	连续回缝的速度设定
007. S	慢速起缝速度 r/min	150～2800	400	慢速起缝的速度设定
008. SLS	慢速起缝针数（针）	0～99 针	2	慢速起缝的针数设定
009. A	自动定寸缝速 r/min	300～5000	3000	操作面板盒 AUTO 键在按下时的速度设定
010. ACD	定寸缝后自动执行终止回缝功能（不补针功能设定）	OFF/ON	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。即在任何缝制模式下，终止回缝前不能作补针功能。 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始可。终止回缝前能作补针功能。
011. RVM	手动动倒缝时功能	JUK/BRO	JUK	手按车头回缝开关动作时机：JUK：

	模式选择			JUKI 方式 （即在车缝中或者停止时均有动作） BRO：BROTHER 方式（即在车缝中才有动作）
012. SMS	起始回缝运动模式选择	A/M	A	A：轻触踏板，即自动执行定寸缝动作 M：受踏板控制，可任意停止与起动
013. TYS	起始回缝结束后操作模式选择	CON/STP	CON	CON：起始回缝完成后，自动连续下一段功能； STP：起始回缝段针数完成后自动停止
017. SBN	起始回缝回数设定	1~4 回	2	设定起始回缝的来回次数
018.BT1	起始回缝补偿 1	提前动作：1~16 延迟动作：17~31	7	BT1, BT2 = 0 无效 BT1, BT2 = 1~16 提早动作时机(1/8 针为单位) BT1, BT2 17~31 延迟动作时机(1/8 针为单位)
019.BT2	起始回缝补偿 2		6	
020. SME	终止回缝运动模式选择	A/M	A	A：轻触踏板，即自动执行定寸缝动作 M：受踏板控制，可任意停止与起动
024. EBN	终止回缝回数设定	1~4 回	2	设定终止回缝之来回次数
025.BT3	终止回缝补偿 3	提前动作：1~8 延迟动作：9~15	6	BT3, BT4 = 0 无效 BT3, BT4 = 1~16 提早动作时机 BT3, BT4 = 17~31 延迟动作时机
026.BT4	终止回缝补偿 4		7	
030. BCC	终止回缝时 C 段再加 1 针	OFF/ON	OFF	终止回缝时 C 段自动再加 1 针 ON：有效 OFF：无效
031. SMB	连续回缝运动模式	A/M	A	A：轻触踏板，即自动执行定寸缝动

	选择			作 M：受踏板控制，可任意停止与起动
032. BAR	连续回缝参数设置方式	0/1/2	0	0：连续回缝 A.B-D 次（最大 9 针） 键盘最后一种操作模式键：配置 I 型操作，定义为 E.F.G.H.H.G.F.E 操作,没有 P1～-PF 操作模式 1：连续回缝 AB.CD-F 次（最大 99 针） 需要配置 II 型操作面板，同时具有 P1～-PF 操作模式 2：连续回缝 A.B-F 次+C.D（最大 9 针） 需要配置 II 型操作面板，同时具有 P1～-PF 操作模式 该参数修改后，断电 10 秒后重启才生效
035. BT5	连续回缝补偿 5	提前动作：1～16 延迟动作：17～31	7	BT5, BT6 = 0 无效 BT5, BT6 = 1～16 提早动作时机 BT5, BT6 = 17～31 延迟动作时机
036. BT6	连续回缝补偿 6		6	
037. SMP	定寸缝运动模式选择	A/M	M	A：轻触踏板，即自动执行定寸缝动作 M：受踏板控制，可任意停止与起动
038. PM	保留			
039. PS	回缝按钮补针功能	0/1	0	011. RVM 在 BRO 模式下有效： OFF：回缝按钮不作为补针功能 ON： 回缝按钮作为补针功能；

040. WON	扫线/抓线力功能设定	0/1/2/3	3	0：无扫线动作、无抓线动 1：有扫线动作、无抓线动作 2：无扫线动作、有抓线功能动作（启动时机，角度受 071. W1、072.W2 控制） 3：有扫线动作、有抓线动作
041. PBS	件数统计/底线计数设置	0/1/10/100	0	0—件数统计模式，按件加工件数递增 非 0—底线计数模式，按计数递减 1—基数为 1 递减 10—基数为 10 递减 100—基数为 100 递减
042. PSM	车缝途中停止时，押脚出力选择	OFF/ON	OFF	OFF 表示取消抬押脚功能
043. FTM	切完线停止时，押脚出力选择	OFF/ON	OFF	OFF 表示取消抬押脚功能
044. PN	车缝完成件数显示	0~~9999	0	根据 041.PBS 参数设置，显示自动累计完成件数或者底线量
045. SSS	慢速起缝功能选择	OFF/ON	OFF	OFF 表示取消慢速起缝功能

5.2 B 功能参数表(技术人员使用)

按 P 键同时打开电源，2 秒后进入技术员模式，每修改一项参数后需按 键才能对修改的参数保存。

参数代码	参数内容	范 围	初始值	设置内容数值说明
046. DIR	马达转动方向设定（正反转）	CW/CCW	CCW	CCW：逆时针方向 CW：顺时针方向

047. MAC	缝纫机机型号	0~256	6	缝纫机机型码设定，小于 80 是平缝型号 其中 9：特殊平缝型号，具有启动默认一针慢启动。在慢启动关闭情况下自由缝第一针总是慢的。
048. SYM	同步器型号设定	0~3	a:2 b:3	0：H 型同步器，兼容 HOHSING 1：B 型同步器，改进型同步。上针位、下针位、自检信号线 2：D 型同步器，配置直接驱动型 DB9，没有同步器安装电气自检信号线。上针位、下针位、编码器信号共线。 3：S 型同步器，具有零点信号，下针位、上针位需要 076.DRU、078.URU 设定针位角度（以零点为基准）
049. SPD	车头皮带轮的尺寸	30~200	75	随车头机型码设定，已预置车头皮带轮尺寸
050. MPD	马达皮带轮的尺寸	50~150	75	随车头机型码设定，已预置车头皮带轮尺寸
051. CHK	上电自检功能是否开启（脚踏信号、断电检测）	0~10	1	1：上电自检功能开启 0：上电自检功能关闭 扩展功能设置：堵转判断时间 0，即 10 秒 1，即 2 秒 2，即 3 秒 ..... 9，即 10 秒
052. PA	脚踏前踏缝制速度响应灵敏度设置	50—400%	200%	5%速度随踏板响应最慢， 400%速度随踏板响应最快， 可根据操作人员熟练程度设置

053. FT	缝制过程中半后踏（轻后踏）抬压脚确认时间	50~~2000ms	300	若有安装压脚提升器，请根据缝纫机的机械踏板的灵活性设定参数
054. BK	马达停止时，煞车锁住功能	OFF/ON	OFF	ON：马达停止时，煞车锁住车头 OFF：无作用
055. TOT	UTD=ON 时， 马达运转总限时间	1~~800Hrs	2	最长可达 33 天（800 小时）
056. TM1	UTD=ON 时，马达运转时间	1~~60s	3	在自动运转测试时，自由缝的工作时间
057. TM2	UTD ON 时，马达停止时间	1~~60s	3	在自动运转测试时，每次的间隔时间
058. UTD	自动运转测试功能	OFF/ON	OFF	该参数设置为 ON，自动运转测试开始，按选针盒的设置的缝制模式运行
059. T	切线、停车的速度设定 r/min	120~~400	**350**	切线停车的速度调整，速度过低可能导致无法正常切线，速度过高可能导致定位控制不平稳
060. L	低速速度 r/min	120~~400	**250**	运行低速速度调整
061. FO	押脚、回缝全额初始出力的动作时间 ms	0~~990	250	押脚、回缝开始动作时，全额出力的动作时间
062. FC	押脚、回缝动作的周期信号%	10~~90	28	押脚、回缝动作时，以周期性省电输出，避免押脚发烫
063. FD	延迟马达启动，保护押脚下放时间	0~~990	50	踩下时延迟启动时间，以配合押脚放下的确认
064. HHC	半后踏取消抬押脚能	OFF/ON	ON	ON：半后踏时，无抬押脚出力，并直接剪线动作 OFF：半后踏时，有抬押脚出力，不剪线（全后踏才剪线）
065. SFM	安全开关信号形式	0/1	0	0 ：安全开关入力信号，必须保持常开状态； 1 ：安全开关入力信号，必须保持常闭状态

066. LTM	切线时序模式	0/1/2/3	2	0：保留 1：保留 2：下定位切到上定位切线模式（平车切线模式） 3：绷缝车切线模式（上停切）
067.T1	抓线启动的机械角度（从上针位为 0 的机械角度）	0～180	**150**	从上针位开始的若干机械角度吸合抓线电磁铁，如果设置 10，即上针位位置后 10 度**吸合**电磁铁
068.T2	抓线电磁铁吸合动作持续角度（机械角度）	0～360	**150**	抓线电磁铁吸合动作经历的角度（机械角度），即从.T1 开始转动到(T1+T2)角度释放.其中（067.T1+068.T2）和必须大约 076.DRU 的数值
069. M	中途停车速度设定	150～800	350	中途不剪线停车速度设定
070. NC	剪线停车后反向提针角度设置	0～280	0	0：不需要反向提针 1－280 反向提针角度，4 表示 1 度
071. W1	扫线动作前的延迟时 ms	0～980	10	找到上定位后进至拨/扫线时序的间距时间
072. W2	扫线动作时间 ms	0～9990	70	拨/扫时序的动作时间
073. WF	押脚动作前的延迟时间 ms	0～990	50	拨/扫动作完后进至抬押脚时序前的间距时间
074. FHT	车缝停止时自动押脚上升维持时间 s	1～200	30	自动抬押脚上升的维持时间
075. UEG	上停针停止时的位置调整	5～250	40	微调修正上定位停止时的角度位置（中心数值为 40）：数值减少时会提前停针，数值增加时会延迟停针
076. DRU	由下针位算起的反向转动达到上针位的角度	1～360	165	【048.SYM】设定 3 時，由针下算起达到上针位的反向角度以设定虚拟下针位

077. ANU	开电后自动找上定位	OFF/ON	**ON**	ON：开启电源后，自动找到上定位信号后停止 OFF：无作用
078. URU	由上针位算起的反向转动达到零点的角度	1～360	a:0 b:235	【048.SYM】设定 3 時，由零点算起达到上针位的反向角度以设定虚拟下针位
079. ERR	上次故障的错误代码	0～999	0	0—无故障发生

5.3 恢复出厂设置：

同时按住  键和  键情况下上电，参数会恢复到出厂备用数据（存放在主板内的备用数据-默认值）

1、操作方法：同时按住  键和  键情况下，然后上电，显示“3-xxxx”，5 秒内主板内的参数恢复到出厂的设置默认数值配置，关电后重新上电。

6 错误信息码及处理对策：

错误代码		代码含义	可能存在的问题	解决措施
严重错误	ERR—00	输入信号自检错误	1．脚踏板电路存在问题或者上电自检发现脚踏板一直处于前踏、后踏状态无法回复到中立位置； 2．直流母线电压偏低； 3．驱动模块故障信号不正常。	1．松开脚踏板，回复到中立位 2．检查脚踏板的信号线是否连接好
	ERR—01	车头信号反馈不正常	1．同步器不正常，无法检测上针位； 2．传感器的磁铁脱落； 3．皮带脱落或者过于宽松。	

	PWROFF	断电	1．30V 保险丝故障； 2．系统断电。	断电，检查各个保险丝，重新上电
	ERR—03	车头运行不正常	1．同步器不正常，无法检测下针位； 2．传感器的磁铁脱落； 3．皮带过松或者脱落。	
	ERR—04	过流、过压、欠压	1．电机功率驱动模块故障；2．瞬间干扰。	
	ERR—05	直流母线电压超压	1．制动电阻坏或者制动保险丝烧断； 2．瞬间干扰。	关闭系统电源检查
	ERR—06	电磁铁供电电源过流	1．电磁铁负载过大或者短路； 2．驱动电路故障； 3．瞬间干扰。	关闭系统电源检查
	ERR—07	堵转	1．机械卡住； 2．剪线机构有问题； 3．编码器信号不正常；	关闭系统电源检查，检测缝纫机机械特性是否正常
一般警告	A	定位停车错误	1．MPD、SPD 参数设置不对； 2．负载过大； 3．编码器信号不正常； 4．同步器信号不稳定； 5、电机故障，驱动力不足。	断电，检查车头和电机是否正常
	B	超过规定最大速度	1．超过同方向最大速度； 2．超过反方向 300r/min； 3．编码器信号不正常； 4．电机故障（如退磁）。	1．控制箱与电机之间驱动线 U/V/W 连接是否良好 2．系统是否已经可靠接地
	C	同步器自检错误	同步器没有插上。	1．断电，插上同步器，再上电 2．更换同步器

	D	EEPROM 错误	存放参数的 EEPROM 有问题	更换 EEPROM
	E	EEPROM 内设置参数错误	EEPROM 内设置参数不正确。	上电重新启动
	F	电机编码器输出信号错误	如果“F”持续报警，说明电机内置编码器存在问题。	检查电机输出信号线是否断线或者接触不良

发生故障后，首先关闭系统电源，检查控制系统接地是否良好。30 秒后重新启动电源观察系统是否能正常工作。若故障没有清除，请多试几次，仍然没有清除时，请联系供应商。

7.操控盒显示字符与实际数值对照表：

数字字体部分：

实际数值	0	1	2	3	4	5	6	7	8	9
显示字体	0	1	2	3	4	5	6	7	8	9

英文字体部分：

实际字母	A	B	C	D	E	F	G	H	I	J
显示字体	A	b	C	d	E	F	G	H	I	J
实际字母	K	L	M	N	O	P	Q	R	S	T
显示字体	K	L	n	n	o	P	q	r	S	T
实际字母	U	V	W	X	Y	Z				
显示字体	U	u	W	H	Y	Z				

Contents

Foreword

Attention!

Please make sure that you have read the user manual and the enclosed sewing machine instruction before operating the machine and it must be debugged or operated by the professional person, who has been trained. Once operating the machine, you were supposed that have already read the manual and know the function and the using range for the product.

The product is only applicable for the sewing machine which is in the specified range.

The final explanation belongs to our company.

Please contact our distributor or our company directly when you have any questions to our products or any advises to our service.

Safety instruction

1. The sign ⚠ means safety warn, user must take care and obey it strictly. Otherwise it will cause personal injury or machine damage.
2. The sign ⚠ means the safety warn about the high-voltage and the electronic. User must take care and obey it strictly. Otherwise it will cause personal injury or machine damage.
3. The product must be debugged and operated by the professional perso who has been trained.
4. ⚠ When connecting the power, make sure that it is conformed to the voltage and the technical requirements marked on the label, and the product connect the ground.
5. ⚠ Don’ t step the pedals when the power is being connected.
6. ⚠ It’ s a precision electronic product. Please don’ t use when thundering or the voltage is not steady or the poor contact. It may cause the machine damage.
7. ⚠ The power must be cut off when doing the following operations:
   - ■When installing the machine
   - ■When opening the control box and pulling out and inserting any plug from the control box.
   - ■When opening the head of the machine, changing the needle and threading a needle.
   - ■When thundering, the machine stops working or haven’ t been used for a long time, being mended or being adjusted.
8. When restarting the machine, the interval must be longer than 30 seconds.
9. It must be set and mended by the professional person who has been trained.
10. All the spare parts for mending must be supplied by our company or confirmed by our company before using

1.Product instruction

1.1 summary

The industrial sewing machine digital AC servo system adopts many high technical digital control and AC servo technology. The technology and function achieve or exceed the international advanced level. It is a high-end product which adapts to industrial super high-speed lockstitch sewing machine. Compared with the normal clutch motor, it can save more than 40% power. The efficiency of the industrial sewing machine has been improved greatly, and the cost is lower. Increase the competitiveness of the garment factory.

The system is composed of AC servo motor and controller.

The AC servo motor adopts the rare earth permanent magnetic brushless servo motor. It has the advantage of small, light, long life-time, big power, low voice, low vibration, high efficiency, big torque, running steady and easy to install.

The control box adopts the aluminum alloy shell. The box has high intensity, the heat dissipating is much better; the anti-jamming capability is stronger. The control circuit adopts the advanced photoelectric separation technology and the vector control technology. The high-speed control chip can control the motor speed in high accuracy, can stop the needle quickly, the position is precise and easy to operate.

The circuit board adopts the advanced high speed paster technology. The machine’ s power supply system adopts switching power supply. It’ s suitable for larger voltage range. It has the function of over-voltage protection, under-voltage protection, over-current protection, short-circuit protection advanced fault self-diagnosis and man-machine dialogue. It can prevent the machine breakdown in abnormal state, make sure the control system working regularly.

1.2The product operating environment

1.2.1 Please keep far away from the place where has high frequency electromagnetic wave and Radio transmitter when operating the machine, otherwise it will cause false action.

1.2.2 The product operating temperature requirement:

a. Please operate the machine in the temperature between 5℃ and 45 ℃.

b. Please don’ t operate the machine in the direct sunlight or outdoor.

c. Don’ t operate the machine beside the heater(electric heater).

d. Keep the working place’ s relative humidity in 30%~95%.

e. Please don’ t operate the machine beside the combustible gas or the explosive.

1.2.3 Rated working voltage: 220V+10% 50(60) HZ

1.2.4 Electric resistance of system connecting ground: <4Ω

1.3 Product specifications

Motor output power: 400W,500W and 550W ,optional

Motor Pulley Diameter: 80mm

The diameter of the sewing machine head reel: 65～130mm,the setting of default is 75mm

Sewing Speed:150r/min～5000r/min

The way to adjust speed： CVT, it can also run automatically at constant speed.

Input Signal Port: 2 ways, including the switch of manual reverse sewing switch and safety switch.

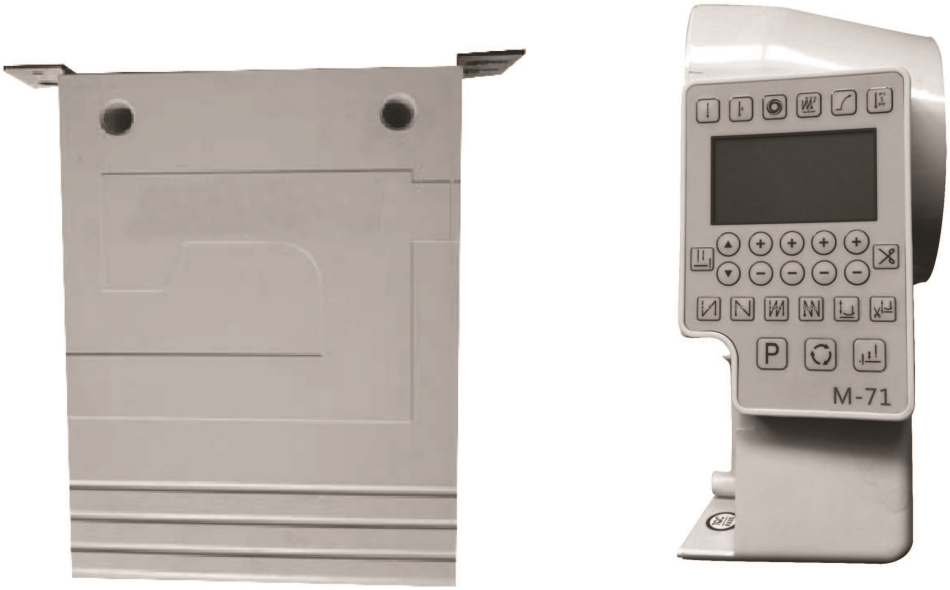
Solenoid Signal Output Port: 5 ways, including tangent, sweep line, clamp line, reverse sewing and the foot presser solenoid drive.

Fault protection: over-current, over-temperature, short circuit, stall etc.

The judgment time of stall protection:1.5 seconds

1.4 Component and construction

1.4.1 The control box as below the picture 1



a 70T b 70E2

Picture 1

1.4.2 The outside double control panel as below picture 2

a 70T b 70E2

Picture 2

2、Installation and adjustment

2.1.1 The installation of the operate panel

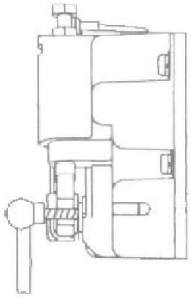
The operate panel is fixed on the support. The support is fastened by two screws on the rear window back of the head. As below picture:

2.1.2 The installation of the control box

Control box is fixed by automatic screw, and the effect as below picture:

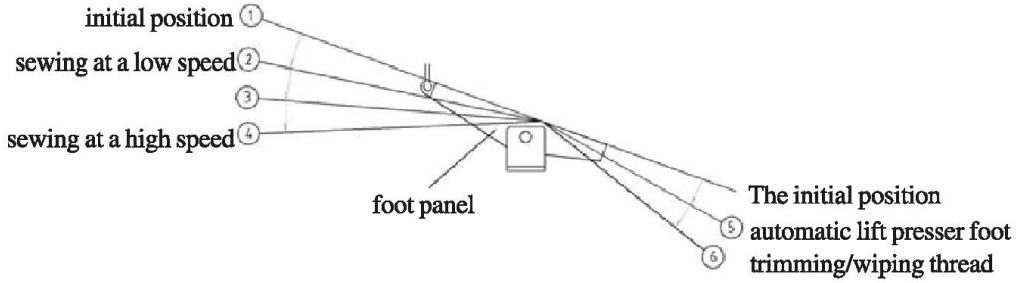
2.1.3 The installation and adjustment of the pedal

Penetrate the pedal connecting bar into the hole of the pedal rocker and fasten the screw nut, and adjust the connecting bar’ s length according to the actual needs to get the best pedals angle, so that the pedal is comfortable and convenient. The pedal’ s angle from the start position to the highest speed position and the sewing speed and each movement’ s connecting as below pictures:



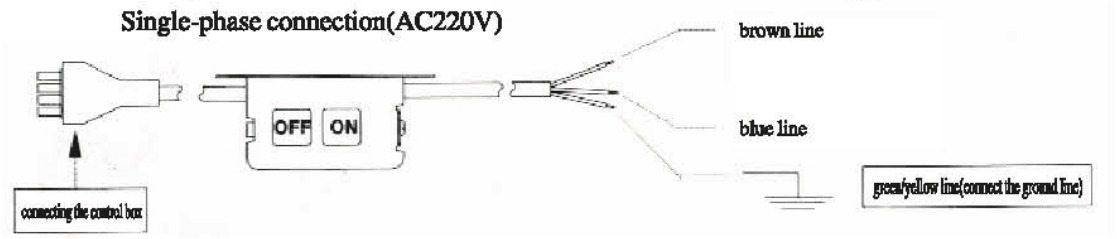
The pedal step forward from the start position ①to the position ②, the sewing machine start to work at a low speed. And continue to step to the position ④, the machine work in a high speed. Between them is infinitely adjustable-speed. The pedal step backward from start position ①to the position ⑤,the machine start to trim line, and continue to move to position ⑥, the foot presser will lift automatic(only in the case that the machine installed the auto presser foot electromagnet),and the needle bar stop to the up needle position.

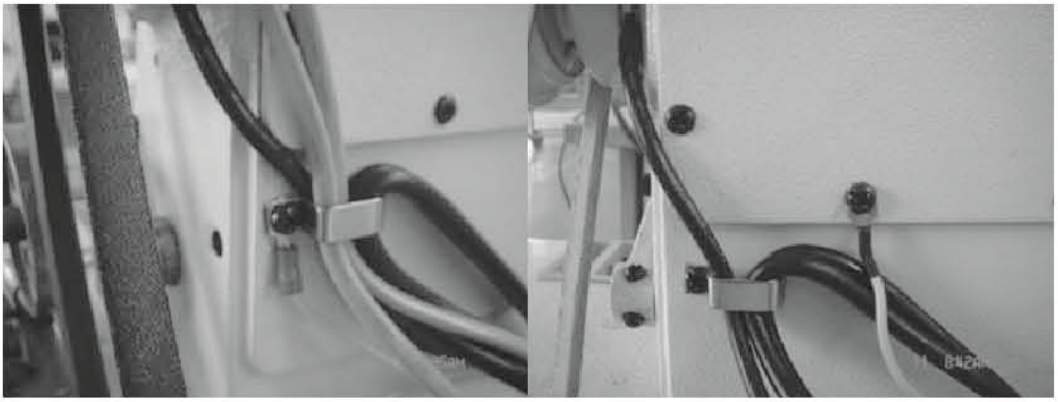
The adjustment of the foot lifter as below picture:



2.1.4Cord connection and ground connection

Connect the power cord and button switch as the following picture

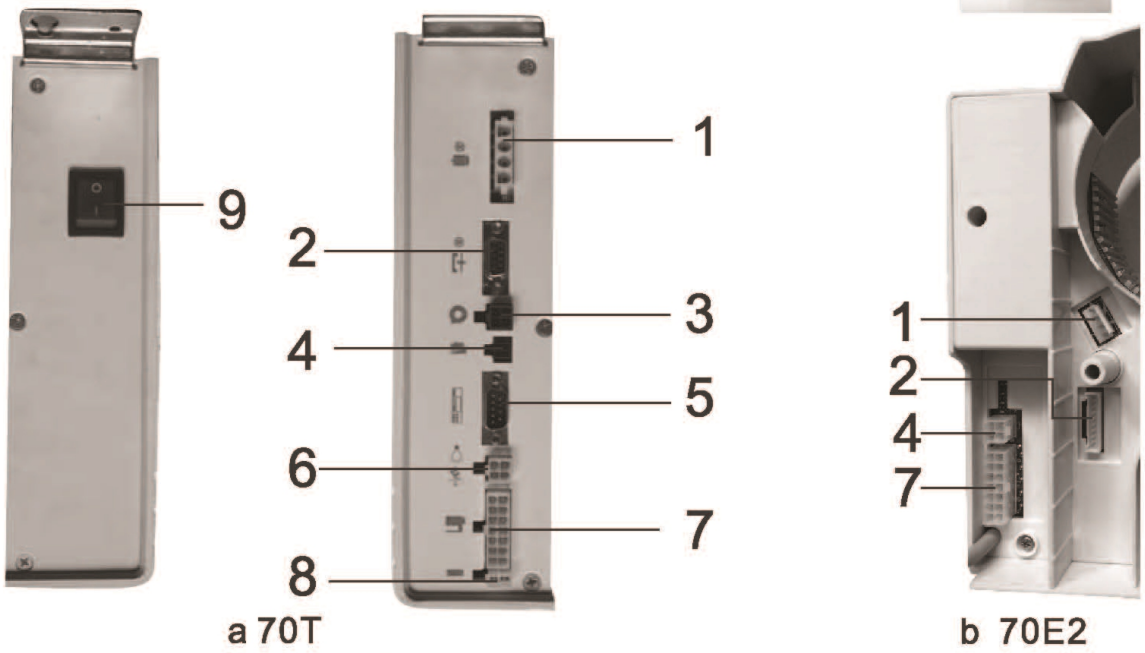




Attention:

- The green yellow line is the ground line. It must be connected to the ground safely. The resistance should be below 4 Ω (<4 Ω).
- When all power cord/signal cord/ground cord connect, please make sure that they are not pressed by other things or they are not bent overly, and surface should not be damaged. Can't be close to the belt and the pulley, at least keep 3CM away from them to make sure to be safe when fasten them.
- The power plug must adopt two phase three wire socket, at the meantime user should make sure that the ground cord connected to the ground safely.
- The power cord of 70E(M-70) controller is special power cord, and don't use other type controller power cord, otherwise it has the danger of electric shock.

2.1.5 The specification of connector socket:



a 70T b 70E2

①Servo-motor socket ②Motor encoder socket

③Head locator socket ④Foot pedal switch socket

⑤Control box socket ⑥5V light and safety switch socket

⑦Electromagnet socket (the yellow-green line is the machine head ground line)

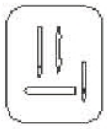
⑧Clamp solenoid socket ⑨220v power switch

⑩Power club socket

Please insert each connecting line according to the instruction of the terminal block panel. After DB plug lock insert firmly, and determine that lock catch has been anchored after the rest of the plug insert.

3. Function introduction

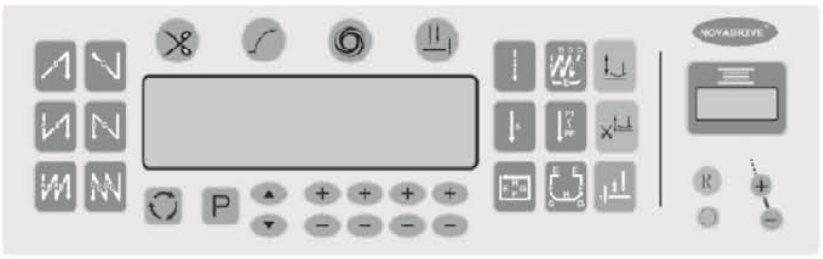
3.1 product function

	Function	Diagram	Description
Auto function	Auto thread trimming		The machine will finish the motions automatically according to the user's setting after the sewing machine is installed the foot lifter electromagnet
	Auto thread sweeping	O/I	
	Auto foot lifter		
	Front straight line bar-tacking		After the sewing machine is installed the reverse sewing electromagnet, it finished once, twice and many times reverse sewing automatically to reinforce the start and end stitch according to the user's setting.
	Continuously reverse sewing		
	Auto stitch quantity sewing		
	Free sewing		
	Back straight line bar-tacking		
Other functions	The selection of up/down stop needle position		Up/down needle position are optional during the sewing.
	Slow start		When motor begins running, it will execute the slow-start needles first before regular sewing.
	Over-current, overvoltage, Locked rotor, power off	Reference for the error code	It will be self-protection automatically when overvoltage, over-current and power-off happened.

4 Basic operation

4.1 The operation of display panel

Control panel as below picture:

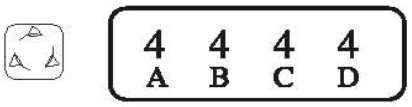
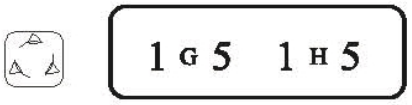


a 70T

b 70E2

The key and function:

Function	Key	The instructions of lockstitch Sewing motions
The selection of front straight line bar-tacking		Execute front straight line bar-tacking (A,B sections)twice
		Execute front straight line bar-tacking (A,B sections) once
		Execute front straight line bar-tacking B section
The selection of back straight line bar-tacking		Execute back straight line bar-tacking (C,D sections) twice
		Execute back straight line bar-tacking(C,D sections) once

Stitch quantity sewing		1)When the pedal is stepped forward, the machine executes the E, F or G section' s position needles. 2)Once the pedal is back to the middle position during any section' s lockstitch sewing, the machine stops sewing immediately. Now step the pedal forward again, the machine begins to execute the E, F, or G, H section' s left needles. 3)When the machine finishes the last section' s needles of the E, F, G, H, it will stop reverse sewing, thread trimming, or thread sweeping etc motions automatically. 4)The P1-P4' s factory setting number is 15 when the P1-PF' s function is used. If not, the number is 0
Free sewing		1)The machine sew regularly when the pedal is stepped forward, it stops sewing when the pedal is back to middle position. 2)The machine finishes thread trimming and thread sweeping automatically when the pedal is stepped towards back.
Continuously reverse sewing		1)The machine executes the continuously reverse sewing motion automatically when the pedal is stepped forward. The time is up to the D section setting. 2)After stepping the pedal forward, the machine executes the function to finish the thread trimming automatically, it won' t stop sewing in the midway unless pressing the pedal towards the back to cancel the motion.
Number of needles setting selection		For A,B,C,D four sections, the No. of needles can be set from 0 -F For E, F,G,H four sections, the No. of needles can be set from 0-99.  Means A=B=C=D=4 needles  Means E=F=10 needles  Means G=H=15 needles Pressing the key can choose to switch the up sections A,B,C,D, middle sections E,F, below sections G,H' s No. of needles setting and windows show. After changing the parameter, please press the key to reserve.

Lift/compen-sate Needles		1)In the free sewing Pressing the key can do the function of lift needle or half-needle compensation forth motions(it can do the continuous compensation sewing motions according to the actual needs) 2)In the stitch quantity sewing:(except continuously reverse function) a. When the lockstitch sewing stop in the midway of every section, the machine will only do the lift needle when pressing the key. b. When the lockstitch sewing stop in the end of every section, press the key that it will compensate one needle forward. (It can do the continuously compensate needles according to the actual needs).
AUTO		1） In the free sewing and continuously sewing model: Press the key, the buzzer will sound, but have no the LED function and no bright. 2) In the stitch quantity sewing press the key: a.When the pedal is stepped forward, it will execute the setting needles in the E,F or G,H sections, the AUTO will stop automatically when all the needles in the sections are finished. b. Then touch the pedal one by one ,the machine will execute the next section’ s needles until to finish the thread trimming and thread sweeping.
Thread trimming switch		Set use or cancel the thread trimming function. It will execute the thread trimming function when the diagram shows in the LCD control box. It won’ t execute the thread trimming function when the diagram doesn’ t show in the LCD control box.
Slow start		1)When the function turned on, when the motor start the machine will execute the slow start needles before regularly sew. It will only sew regularly when it’ s pressed forward again after stopping in the middle, unless the pedal is stepped towards back and then stepped forward ,the motor will execute slow start before running. 2) The speed of the slow start setting can adjust by parameter[6] 3) The No. of needles of the slow start can adjust by parameter[7]
The position of needle stop(up/down) setting when motor stop		The position of needle stop setting when motor stop When the diagram show in the LCD control box, the needle stop in the up position when motor stop. When the diagram doesn’ t show in the LCD control box ,the needle stop in the down position when motor stop
The auto foot lifter up/down after thread trimming		The presser foot move or not after thread trimming When the diagram shows in the LCD control box, the presser foot will lift up automatically after thread trimming. when the diagram doesn’ t show in the LCD control box, the presser foot won’ t move after sewing stop

The auto foot lifter up/do within when stop in the sewing		The foot lifter move or not when sewing stop. When the diagram shows in the LCD control box, the presser foot will lift up automatically when sewing stopped. When the diagram doesn't show in the LCD control box, the presser foot won't move when sewing stop.
Parameter increment setting		Setting the No. of needles in A, B, C, D areas increment. The number can be set from 0 to F. Setting the No. of needles in E, F, G, H areas increment. The number can be set from 0 to F. The number increment key should be set in the parameter area.
Number decreasing setting		Setting the No. of needles in A, B, C, D areas decreasing, the number can be set from 0 to F. Setting the No. of needles in E, F, G, H areas decreasing. The number can be set from 0 to F. The number decreasing key should be set in the parameter area.
Enter into the parameter area/ Parame-ter increment		Press the key for two seconds can enter into parameter area. The key can be considered as the button of parameter increment
The number of bottom line recovery/ The setting button of bottom line		Press once shortly and recover the current number of bottom line to the setting number. Then press for 3 seconds and enter to the setting number of the bottom line.
Show the toggle key		The bottom line can be switched to be transferred digit number.
Increasing button		When pressing the increasing button, the setting data will increase in the setting range
Decreasing button		When pressing decreasing button, the setting data decrease in the setting range.

Note: In the needle selection box, A=10, B=11, C=12, D=13, E=14, F=15 needles.

5. Function parameter list

5.1 A function parameter list (for user)

Press the [P] key for 2 seconds to enter into the user operating model afte turning on or thread trimming, and each need to press the button [▲▼] to reserve after modify parameter.

Parameter code	Corresponding content	Range	Factory setting	Content instruction and memo
001. H	the highest rotational speed r/min	150~5000	3500	The setting of the lockstitch sewing highest speed is related to the machine
002. PSL	the adjustment of acceleration curve%	1~100%	80%	The setting of the controller climbing slope.
003. NUD	The options of stop needle position	UP/DN	DN	UP(Up stop-needle)/DN(down stop-needle)
004. N	Starting reverse sewing speed r/min	150~2800	1800	The setting of starting reverse sewing speed
005. V	Stopping reverse sewing speed r/min	150~2800	1800	The setting of stopping reverse sewing speed
006. B	Continuously reverse sewing speed r/min	150~2800	1800	The setting of continuously reverse sewing speed
007. S	Slow starting sewing speed r/min	150~2800	400	The setting of slow starting sewing speed
008. SLS	Slow starting sewing needle number(needle)	0~99 needles	2	The needle setting of slow starting sewing
009. A	Auto stitch quantity sewing speed r/min	300~5000	3000	The operation panel box AUTO key has the speed setting under pressing.
010. ACD	Automatic execute the function of stopping reverse sewing after stitch quantity sewing (Setting the function of un-compensate needle)	OFF/ON	ON	ON: After executing the last setting needle sewing, it will stop the reverse sewing automatically. Even in any sewing modes, it can not compensate needle before stopping reverse sewing. OFF: After executing the last setting needle sewing, it will not stop the reverse sewing automatically. It must restart, and it can compensate before stopping reverse sewing.
011. RVM	Manual reverse sewing function	JUK/BRO	JUK	The time that pressing the switch of the head reverse sewing: JUK:

				JUKI way （Even in the lockstitch sewing and stop, there are also actions) BRO：BROTHER way（Only in the lockstitch are there actions.）
012. SMS	The sport mode selection of starting reverse sewing	A/M	A	A：Step the pedal lightly and it will execute the stitch quantity sewing automatically. M：It can stop and start by controlling the foot pedal.
013. TYS	The operation mode selection after starting reverse sewing	CON/STP	CON	CON：After finishing the starting reverse sewing, it can continue sewing next function. STP：After finishing the starting reverse sewing, it will stop automatically.
017. SBN	Starting reverse sewing setting	1～4	2	Set the back and forth times of starting reverse sewing
018.BT1	Starting reverse sewing compensation 1	Advanced actions: 1～16 Delay actions: 17～31	7	BT1,BT2＝0　Invalid; BT1,BT2＝1～16 ahead action (1/8,the unit is needle); BT1,BT2＝17～31 delay action (1/8,the unit is needle);
019.BT2	Starting reverse sewing compensation 2		6	
020. SME	The sport mode selection of the stopping reverse sewing	A/M	A	A：Step the pedal lightly and it will operate the setting sewing automatically. M：It can stop and start by controlling the foot pedal.
024. EBN	Stopping reverse sewing setting	1～4	2	Set the back and forth times of the stopping reverse sewing
025.BT3	Stopping reverse sewing compensation 3	Advanced actions: 1～8 Delay actions: 9～15	6	BT3,BT4＝0　Invalid; BT3,BT4＝1～16 ahead action; BT3,BT4＝17～31 delay action;
026.BT4	Stopping reverse sewing compensation 4		7	
030. BCC	When stopping reverse sewing, C add to 1 needle.	OFF/ON	OFF	When stopping reverse sewing, C add to 1 needle automatically. ON: valid　OFF: invalid
031. SMB	Continuously reverse sewing sport mode	A/M	A	A：Step the pedal lightly and it will execute the setting sewing automatically. M：It can stop and start by controlling the foot pedal.

032. BAR	Continuous reverse sewing parameter setting	0/1/2	0	0：Continuously reverse sewing A,B,D (The maximum is 9 needles) The last operation mode of the keyboard: The operation of I style is defined as E,F,G, H,H,G,F,E,and don't have the P1~PF operation mode. 1:Continuously reverse sewing AB.CD-F （The maximum is 99 needles) It needs to deploy II operation pedal and has the P1~PF operation mode. 2:Continuously reverse sewing A.B-F+C.D （The maximum is 9 needles） It needs to deploy II operation pedal and has the P1~PF operation mode. After this parameter changes, it will work after power-off 10 seconds to re-start.
035. BT5	Continuously reverse sewing compensation 5	Advanced actions：1～16 Delay actions：17～31	7	BT5,BT6 = 0 invalid; BT5,BT6 = 1～16 ahead action time; BT5,BT6 = 17～31 delay action time;
036. BT6	Continuously reverse sewing compensation 6		6	
037. SMP	The sport mode selection of the setting sewing	A/M	M	A：Step the pedal lightly and it will execute the setting sewing automatically. M：It can stop and start by controlling the foot pedal.
038. PM	Retain			
039. PS	The compensation needle function of the reverse sewing button	0/1	0	011.RVM is valid at the mode of BRO; OFF: The reverse sewing button can't be regarded as the function of the compensation needle; ON: The reverse sewing button can be regarded as the function of the compensation needle；

040. WON	Sweep line/grasp line output function setting	0/1/2/3	3	0：Don’t have the action of sweeping line and grasping line 1：Have the action of sweeping line and don’t have the action of grasping line 2：Don’t have the action of sweeping line and have the action of grasping line(When the machine start, the angle is in the control of 071.W1、072.W2) 3: Have the action of sweeping line and grasping line.
041. PBS	Unit statistics/The setting of bottom line count	0/1/10/100	0	0—The mode of the number statistics, it increases according to the quantity of processing; Not 0—The mode of the number statistics, it decreases according to the quantity of processing 1—The cardinal number 1 decrease 10—The cardinal number 1 0 decrease 100—The cardinal number 1 00 decrease
042. PSM	When it stops during the lockstitch sewing, and select the presser foot output.	OFF/ON	OFF	OFF: It means to cancel the function of the foot lift.
043. FTM	When trimming stops , and select the presser foot output.	OFF/ON	OFF	OFF: It means to cancel the function of the foot lift.
044. PN	The finished number of lockstitch sewing	0~9999	0	Setting according to 041.PBS parameter, it will show the finished number or the number of bottom line
045. SSS	The selection of slow starting sewing	OFF/ON	OFF	OFF: It means to eliminate the function of slow start sewing.

5.2 B Function parameter list (for technician)

Turn on the power while pressing the key P , enter into the technician model after 2 seconds. After changing the parameter, it needs to press the key ▲ to reserve.

Parameter Code	Parameter content	Range	Factory setting	Content instruction
046. DIR	The motor running direction setting	CW/CCW	CCW	CCW：counter-clockwise CW：clockwise

047. MAC	The style of sewing machine	0～256	6	The style set of the sewing machine. Less than 80,it is the lockstitch sewing. 9：Special lockstitch sewing has a slow start needle. At the situation of slow start, the first needle of free sewing is always slow.
048. SYM	The style setting of synchronous machine	0～3	a:2 b:3	0:H is synchronous machine, and it is compatible to HOHSING 1: B is modified synchronous machine. Up needle position, down needle position, self-check signal line 2: D is synchronous machine with direct drive Db9 installed electric self-check signal line without synchronous machine. Up needle position, down needle position, and encode signal。 3：S is synchronous machine, it only has zero signal, up needle position and down needle position that need 076.DRU and 078.URU to set the angle of needle position.
049. SPD	The size of the head pulley	30～200	75	The front pulley size is set along with the head model code.
050. MPD	The size of the motor belt	50～150	75	The front pulley size is set along with the head model code.
051. CHK	Whether power-on self-test function turn on or not. （the foot pedal signal, power-off detection）	0～10	1	1:Power-on self-test function turn on 0:Power-on self-test function turn off The setting of extended feature: Judging the time by locked machine. 0 means 10 seconds. 1 means 2 seconds. 2 means 3 seconds. ..... 9 means 10 seconds.
052. PA	Front foot pedal sewing speed react the sensitivity settings.	50—400%	200%	5% of the pedal speed react the slowest speed，400%of the pedal speed react the pedal the quickest speed, according to the operator proficiency to set.

053. FT	Half step backward presser foot in the process of sewing (step lightly backward presser foot) to confirm the time.	50~ 2000ms	300	If installing the foot lift, please according to the sewing machine pedal flexibility to set the parameters.
054. BK	When the motor stop, the brake can lock automatically.	OFF/ON	OFF	ON: When the motor stop, the brake can lock the head. OFF: No effect.
055. TOT	When UTD is ON, it means the limit time of motor running.	1~800Hrs	2	The longest time is 33 days(800 hours)
056. TM1	When UTD is ON , it means the motor running time.	1~60s	3	When operating test automatically, it means the working hours of free sewing.
057. TM2	When UTD is ON, it means the motor stopping time	1~60s	3	When operating test automatically, each interval time.
058. UTD	The function of automatic operation test	OFF/ON	OFF	When the parameter is ON, the automatic operation test start and run according to the elected needle sewing pattern box to set.
059. T	The speed setting of trimming and stopping r/min	120~400	350	The speed adjustment of trimming parking, the speed is too low that may lead to abnormal trimming. The speed is too high that may lead to an unstable position control.
060. L	Low speed r/min	120~400	250	The speed adjustment of operating slowly
061. FO	The full initial output time of presser foot, reverse sewing /ms	0~990	250	When presser foot and reverse sewing start, the time of the full output.
062. FC	The cycle signal of presser foot and reverse sewing %	10~90	28	When presser foot and reverse sewing operate, the power output periodically to avoid the presser foot hot
063. FD	Delay the motor start to protect the time of the presser foot put down.	0~990	50	When stepping, delay the machine start to match the confirmation of presser foot.
064. HHC	Half-step pedal to cancel the presser foot function	OFF/ON	ON	ON: When half-step pedal, it doesn't have the output of lifting pedal and direct trimming. OFF: When half-step step, it has the output of lifting pedal and don't trim (Trimming only full-step pedal)
065. SFM	Safety switch signal form	0/1	0	0: When the safety switch input signal , it must remain open state; 1: When the safety switch input signal, it must remain normally close.

066. LTM	Trimming time-series mode	0/1/2/3	2	0: retain 1: retain 2:Bottom positioning cut to up positioning trimming mode (lockstitch sewing trimming mode) 3:Interlock sewing trimming mode (the stop cut)
067.T1	The mechanical angle of grasping line start/ms	0～180	150	Absorb the grasp electromagnet from any mechanical angles of the up needle. If setting 10,it is the 10 degree of the up needle that absorb.
068.T2	The continuous angle of absorbing the grasp electromagnet	0～360	150	The angle of absorbing the grasp electromagnet (mechanical angle), from T1 to (T1+T2), the total of (067, T1+068, T2) must be larger than 076.DRU.
069. M	The speed setting of midway parking	150～800	350	The speed setting of midway no-parking trimming.
070. NC	After trimming parking, the angle setting of reverse lifting needle	0～280	0	0: Do not need to lift the needle back. 1-280 the angle of reverse lifting needle, 4 represents one degree.
071. W1	Delay time before sweeping /ms	0～980	10	The interval time of sweeping after finding up-position.
072. W2	Sweeping time /ms	0～9990	70	Sweeping time
073. WF	Delay time before the presser foot /ms	0～990	50	The interval time of entering into the foot lift after sweeping
074. FHT	when sewing stops, automatic presser foot rise maintenance time/s	1～200	30	Automatic presser foot rise maintenance time
075. UEG	The adjustment of the up-needle stop position	5～250	40	Modify lightly the angle position of the up-needle stop (the center number is 40): It will lift the needle stop in advance when the number decreases. It will delay the needle stop when the number increasing.
076. DRU	From the down-needle position reverse rotation reaches the angle of the up-needle position	1～360	165	[048.SYM] set 3:00,from the down-needle reaches the up-needle reverse angle to set the virtual down -needle position.

077. ANU	After power-on, automatically find the position	OFF/ON	ON	ON: After the power turn on, automatically find the positioning signal to stop OFF: No effect
078. URU	From the up-needle position, reverse rotation reaches zero angle	1~360	a:0 b:235	[048.SYM] set 3:00,from zero reaches to the reverse angle of up-needle positions set a virtual down-needle position
079. ERR	The error code of the last trouble	0~999	0	0—No trouble

5.3 Recover the factory setting:

Press the buttons  and  simultaneously, then power-on. The parameters will recover to the factory setting.（The data that store in the mainboard is the default number.)

1. The way to operate: Press the buttons  and  simultaneously, then power-on, it shows "3-xxxx",the parameters inside the mainboard will recover to the factory setting 5 seconds later. Renew power-on after power-off.

6 Error code and the way to solve

Error code		Code Content	The possible problem	The way to solve
Fatal error	ERR—00	The self-test of input signals is wrong	1. The circuit of the pedal has a problem, or the pedal has been in forward riding, backward riding and can't return to the neutral position. 2. DC voltage is low. 3. The fault signal of the drive module is abnormal.	1. Loose the pedal and return to the neutral position. 2. Checking whether the signal line of the pedal insert or not.
	ERR—01	The head signal feedback is abnormal.	1. The synchronous machine is abnormal, and can not find the up-needle position. 2. The sensor magnet is off. 3. The belt is off or over-loose.	

	PWROFF	Power-off	1. The 30v fuse is wrong. 2. The system is power-off.	Power-off and check each fuse and power on again.
	ERR－03	The operation of the head is abnormal.	1. The synchronous machine is abnormal and can't find the down-needle position. 2. The sensor magnet is off. 3. The belt is off or over-loose.	
	ERR－04	Over-current, over-voltage, under-voltage	1.The motor power module is wrong. 2.Immediately interrupt.	
	ERR－05	DC voltage exceeds the voltage.	1.The braking resistor is wrong or the braking fuse is broken. 2.Immediately interrupt.	Close the system power-supply and check
	ERR－06	The solenoid power is over-current	1. The electromagnet is over-loaded or short circuit. 2. The driving circuit is wrong. 3. Immediately interrupt.	Close the system power-supply and check
	ERR－07	Block	1. The machine is blocked. 2. The cutting-line system is wrong. 3. The encoder signal is abnormal.	Close the system power-supply and check whether the sewing machine's mechanical features is normal or not.
General warn	A	The error of the positioning parking	1. The setting of the MPD, SPD parameter is wrong. 2. Over-load. 3. The encode signal is abnormal. 4. The synchronous signal is not stable. 5. The motor is wrong or the driving power is not enough.	Power-off and check whether the head and motor is normal or not.
	B	Exceed the maximum speed	1. Exceed the same direction maximum speed. 2. Exceed the inverse direction speed 300r/min. 3. The encode signal is not normal. 4. The motor is wrong.(Such as demagnetization)	1. Whether the driving line U/V/W between control box and motor connects or not. 2. Whether the system connects ground reliably or not.
	C	The self-test of the synchronous machine is wrong	The synchronous machine doesn't insert.	1. Power-off and insert the synchronous machine and then power-on. 2. Change the synchronous machine.

	D	The error of EEPROM	The EEPROM that store parameters has a problem.	Change EEPROM
	E	The inside parameter of EEPROM is wrong.	The inside parameters of EEPROM is wrong.	Power-on and renew to start.
	F	The output signal of motor code is wrong.	If F continues calling, it states that the inside encode of the motor has a problem.	Checking whether the output signal line disconnect or not.

After having a problem, firstly, shutting down the system supply, and then checking whether the control system connect ground or not.
After 30 seconds, renew to start the power supply and checking whether the power supply work or not. If it still don't work, please try again.
If the problem still eliminate, please contact the supplier.

7 Comparison table for script display on control box with the actual digital

The number style part:

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

The English style part:

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