SiRUBA

電控說明書

ELECTRONIC CONTROL PARAMETER MANUAL

C007KP/BFK

工业缝纫机数控交流伺服系统

Industrial Sewing Machine Digital AC Servo System

BFK用户手册
User Manual

安全说明

1. 本安装与使用本产品前，使用者须仔细阅读本操作手册。
2. 本产品应由受过正确训练的人员来安装或操作。
3. 安装作业时必须关闭所有电源，请记不可带电操作。
4. 所有标有⚠符号的部分，必须注意并按照说明书上的执行，以免造成不必要的损害。
5. 在连接电源线前，必须确定此电压低于 AC250V，且符合本操作中规定的额定电压值。
6. 在安装完成后一次开电后，先关闭伺线动源后伸踏板连接件增缝机平位至转动方向足否灯睡，转动是否平稳。
7. 在进行以下操作前，请先关闭系统供电电源：
   - ◆ 在控制器上插拔任何连接插头时。 ◆ 零针调对。
   - ◆ 翻动缝纫机机头时。 ◆ 修理或保任何机械上的钥螺时。
   - ◆ 机器闲至不用时。
8. 修理或者层次的保济工作，仅能由受过训练的机电技师来执行。
   所有维修用的零件，须由齐公司提供或认可，方可使用。
9. 使用本产品前请远离高频电磁或和电磁发射器等，以免所产生的电磁波干扰制服驱动器装置而发生误动作。
10. 产品应用环境温度、湿度要求：
    - ◆ 请不要在温度45℃以上或5℃以下的场所操作。 ◆ 海不要在日光直接照射的场所或室外运作。
    - ◆ 请不要在暖气（电热器）旁运作。

1.产品规格

1.1 使用环境要求

正常工作环境温度：5℃～45℃
正常工作环境湿度：10%～90%（无凝结）
额定电压：220V±10% 50 (60)HZ
工作环境：本控制系统工作环境应不含有易燃、易爆、有毒、水雾或有腐蚀性的介质
瞬间断电：在额定电压下，小于 20ms
系统接地：小于 4Ω

1.2 产品规格

电机输出功率(Power)：550W、750W
缝制速度(Sewing Speed)：100r/min～4500r/min 可设
调速方法：无级变速，也可自动定速运行
电磁铁输出信号 (Solenoid Signal Output Port)：4 路，包括切线、打线、抬压脚、吸线电磁铁
故障保护：过流、短路、堵转等故障保护判断时间：3 秒

2 安装与调试

2.1 安装

⚠注意：安装前如任何附件均必须先断开电源。

2.1.1 控制箱的安装

第一步：按图2-1尺寸，将控制箱用自攻螺丝紧固。安装后如图2-2所示：

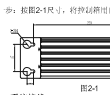


图2-1



图2-2

2.1.2 系统接线

■ 信号线的连接

控制板与电机四只传感器组件、操作面板和电源线等的连接如图2-3所示，将各个连线的插头插入控制箱上对应的插座即可，插好后，检查一下插头是否插牢。


机头电源线
1 零线 6 零线
2 火线 7 火线
3 +5V 8 地
4 LED灯+ 9 LED灯-
5 12
6 霍尔（可选） 13 霍尔（可选）
7 霍尔信号 14 地（接）
霍尔板
1 公共端 5 开关信号1
2 5V 电源 6 开关信号2
3 +5V 7 *
4 GND 8 *
电机编码
1 A相信号
2 B相信号
3 公共端
4 +5V电源
5 GND
6 *
7 *
8 *
输入输出
1 切线输入
2 抬压脚输入
3 *
4 *
5 *
6 *
7 *
8 *
功能输入
1 切线输入
2 抬压脚输入
3 *
4 *
5 *
6 *
7 *
8 *
保护开关
1 *
2 *
3 *
4 *
5 公共端
6 *
7 *
8 *
执行机构
1 +24V
2 +24V
3 +24V
4 +24V
5 +24V
6 +24V
7 +24V
8 +24V
9 输出A
10 输出A-
11 输出B
12 输出B-
13 输出C
14 输出C-
15 输出D
16 输出D-
执行机构
1 步进电机A+
2 步进电机A-
3 步进电机B-
4 步进电机B-
5 步进电机A-
6 步进电机A-
7 步进电机B-
8 步进电机B-
执行机构
1 霍尔地
2 *
3 *
4 *
5 *
6 *
7 *
8 *
9 *
10 *
11 *
12 *
13 *
14 *
15 *
16 *
编码器输入
1 *
2 *
3 B+/B-
4 *
5 *
6 *
7 *
8 *
9 *
10 *
11 A+/A-
12 *
13 *
14 *
15 *
16 *

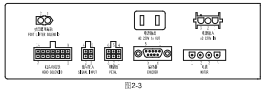


图2-3

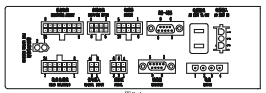


图2-4

2.1.3 连接线束



9孔		12孔	
1 2脚	剪线	1 3脚	剪线
3 4脚	拨线	4 6脚	拨线
9脚	地	10 12脚	剪线保护

⚠ 注意：使用正常的力矩不过大时，请检查插头与插座是否匹配，插入方向或引是否正确。

■ 接地线的安装

按如图中所示安装接地端需要可靠接地。

⚠ 注意：所有电源线、信号线、接地线等接线时不要被其它物体压到或过度扭曲，以确保使用安全！

2.2 安装注意事项

2.2.1 安装调板前时，选打与控制箱连接的一端一般是定在踏板传感器部件最外端的固定孔上，如实际安踏板太短，可以将踏杆拆下后连接另外的两个孔上，增加踏板长度可以调节，需将踏板下连杆调节螺母松开后旋紧踏板与连杆至30°角为宜。

2.2.2 操作面板固定在支架上，依支架图需在机头上，两个安装螺丝的位置由缝纫机厂定制。

2.2.3 接线时应把控制箱插座与标注的文字，以防止装错，请注意：一、断电正确方向插入插头；二、开关或插头与插座不匹配或不进行介绍，请不要使用该控制器并中即与供应商联系；三、供电线与缝纫机连接时，避免插件与线被缠绕而发生故障，建议最好打印号线进行捆扎。

3.功能介绍



图一 操作面板

3.1 缝制模式选择

功能	按键	车缝动作说明
用户参数设定	P	用户进入参数，选择参数的按键
进入参数及确定键	S	用户选择参数后，进入及确定保存的按键
参数与递增	▲	用户选择参数递增按键
参数与递减	▼	用户选择参数递减按键
自由缝/定针缝切换	上	自由缝、定针缝切换键。（灯灭为自由缝模式，灯亮为定针缝模式）
剪刀	✂	开启或关闭剪线功能

触发自动		在定针缝状态下，开启或关闭自动触发功能
上下停针位		上下停针位置的选择按键
慢速起缝		开启或关闭慢速起缝功能
中途抬压脚		开启或关闭中途抬压脚功能
剪线后抬压脚		开启或关闭剪线后抬压脚功能

3.2 恢复出厂设置

1) 先关闭电源开关
2) 长按 P 键,同时开启电源开关,出现"030.MAC"的界面
3) 按 S 键进入,出现"MAC. 0"的界面,连续按 "0" 的位置下方按 ▼ 键,等所有指示灯完后等5秒钟即可

3.3 常用参数设置

3.3.1 如何进入各类的参数模式区

参数模式	操作方式	出现画面	可选取参数范围
第一段	参数模式 A	在一般模式下，直接按 P 键，开保持 2 秒	可选择范围 001～029
第二段	参数模式 B	长按 P 键 + 开启电源	可选择范围 030

附录 1

故障现象及处理对策

序号	故障现象	处理方法与步骤
1	维修前处理	1、控制器出现故障时，首先先进行恢复出厂设置
2	不剪线	1、操作面板上的剪线开关是否开启？如无请开启。 2、请后踏脚踏板传感器确认电机下轮是否转动，如不转，请检查踏板传感器接触点是否接触良好？如接触点良好，请更换踏板。如接触不良，请用小锻子修正好。 3、如电机手轮会转动，请检查剪线电磁铁是否有吸合的声音？如有声音，则为剪线机构机械故障。 4、如无声音，检查电磁铁插头(4)、(5)插针是否接触良好？如未接触好请修正。 5、如接触良好，用万用表测电磁铁，如电阻值不在请更换。 6、如不是电阻值偏小，则为剪线电磁铁损坏请更换。
3	不扦线	1、操作面板上的剪线开关是否开启？如无请开启。 2、请检查缝纫机头上的扦线开关是否开启？如无请开启。 3、请检查电磁铁插头(2)、(3)插针是否接触良好？如未接触好请修正。 4、如接触良好，用外接法更换电控箱，如电控箱坏请更换。 5、如不是电控箱坏，则为扦线电磁铁损坏请更换。
4	脚踏无反应	1、操作面板显示正常，但踩踏踏板缝纫机不工作，踏踏板传感器接头未连接好或踩踏板传感器坏。

5	脚踏时有时无	1、脚踏板传感器与电控箱接触点有时是否接触不良，如果接触不好，请修正。 2、检查踏脚开关接触是否不好，不好请用螺子修正。 3、如接触良好，请更换踏板传感器。 4、如不是踏板传感器故障，则为电控箱坏，请更换
6	缝纫机手轮反转，后报“08”错误	1、检查电机编码盘接头是否插好？如未接触好，请修正触点。 2、如接触良好，按住“P”键开机，再按“P”键所参数调到 65 项，按“S”键进入 65 项参数，查显示“0”的下方按一下“+”键，数值显示“1”，则电机开始电角度测试（电机会断续转动），并自动修正电角度，转电磁停止转动后，按“P”键将参数调到 61 项，按“S”键进入 61 项参数，查看数值，数值范围应在（85-105）之间，如超出范围为电机坏。如电机坏请更换。 3、如不是电机故障，则为电控箱损坏请更换。 4、不同品牌型号的电机与电控箱连接速成的不匹配。
7	报“08”错误	1、转动机头电机手轮开是开车自？如手自调关扦缝机头机械故障。 2、如转动异轮，请检查电机编码盘接头和电机电源接头是否松动？电机电源插头是否有插反如有不好，请修正。 3、如接触良好，检查电网电压是否过低或转速设置的过高？如有请调整。 4、如正常请更换电控箱。
8	报“FF.FE”错误	1、如接触良好，请更换操作面板。 2、如不是操作面板故障，则为电控箱面坏请更换。
9	报“09”错误	1、检查电机编码盘接头是否插好？如未接触好，请修正触点。 2、如接触良好，用外接法更换电机，如电机坏请更换。 3、如不是电机故障，则为电控箱损坏请更换。
10	报“08”错误	1、电机编码盘接头和电机电源接头是否松动？如未接触好，请修正触点。 2、电机过载，请更换。 3、检查电压波动情况，电压波动频繁也会出现此错误。 4、电控损坏，请更换。
11	报“18”错误	1、电网电压低，将参数调到 55 项，进入参数检查母线电压，电压数值低于 230 时电控箱报警，请稳定市电电压。 2、将P53项参数改成“0N”
12	报“19”错误	1、电网电压高，将参数调到 55 项，进入参数检查母线电压，电压数值高于 380 时电控箱报警，请稳定市电电压。 2、将P53项参数改成“0N”
13	报“14”错误	1、电磁铁电流保护，电磁铁长接线板短或电磁铁坏，请更换。 2、电控坏，更换电控箱。
14	报“15”错误	1、剪线保护装置未回位或将P85项参数改成“0”
15	报“18”错误	1、瞬间电压过高，关闭控制器再开机。 2、电控箱内放电电阻坏，请更换电控箱。 3、将P53项参数改成“0N”
16	报“11”错误	1、关闭系统电源，检查电机传感器接头是否松动或脱落，将其恢复正常后重启系统。若仍不能正常工作，请更换控制器并通知厂方。

17	报“21”错误	1、电机回力大，检查电机机械部分是否卡住。
18	报“24”错误	1、电机瞬间反转或空载转动，关机重试或更换电机。

⚠ **注意：**
- 拆装控制器任何部件前，应先断开电源。
- 缝制过程中，不能进行按键修改操作。
- 参数设置更改后，须等到显示屏上数据返回到初始状态时，方可进行缝制。
- 做好日常的清洁工作，使系统免于因灰尘积蒸或其它不良工作环境而产生的故障。

附录 2

【参数模式 A】技术员参数表

参数代码	内容说明	出厂	默认值	内容值范围说明与标注
【001. H】	最高转速(spm)	100～9999	3500	车缝时的最高速度调整
【002. SLM】	慢速起缝模式选择	A/T	T	A：往前轻触踏板，即开动执行慢速起缝 T：当切线动作结束后下一次执车缝动作时自动执行慢速起缝
【007. S】	慢速起缝速度(spm)	100～2000	1200	慢速起缝的速度调整
【008.SLS】	慢速起缝针数	0～99	2	慢速起缝的针数设定
【009. A】	自动定针缝速(spm)	100～8000	2200	Auto 开启下的定针缝速度调整。
【010. ACD】	按线与吹气选择		OFF	OFF按线，ON吹气
【026. UD】	吹气时间（吹气专用）		500	数值越大，时间越长
【028. SP】	车缝速度显示			显示当前实际车缝时的速度值

附录 3

【参数模式 B】系统员参数表

参数代码	内容说明	范围	默认值	内容值范围说明与标注
【030.MAC】	恢复默认值	0～1	0	默认是电切换到 1 恢复出厂设置
【031.SPD】	自动测试运行时间(s)	1～250	5	须在参数 048.DD 设定 ON 状态下有效
【032.TST】	自动测试间隔时间(s)	1～250	3	须在参数 048.DD 设定 ON 状态下有效
【033. L】	低速速度(spm)	100～500	200	低速速度的调整
【035. FO】	抑脚全脚初始出力的动作时间(ms)	0～990	150	抑脚开始动作时，全脚出力的动作时间
【036. FC】	抑脚出力动作的周期信号(%)	10～90	35	抑脚动作时，以反复性长电输出，避免弹脚发烫

【037. FD】	延迟马达启动，仅适抑脚版下时间	0～990	200	踩下时延迟启动时间，以配合抑脚之确认
【038.HHC】	半踏时，取消抬抑脚功能	ON/OFF	OFF	ON：半踏时，将无法作抬压脚动作 OFF：半踏时，可做抬压脚动作
【040. T1】	切线动作前延迟时间(ms)	0～990	0	按到上定位后进入切线动作前的间隔时间
【041. T2】	切线动作时间(ms)	0～990	100	切线的动作时间
【042. L1】	抬压脚后限制速度（低）转数		300	数值越大，抬起时间越长
【044. W1】	拨扦线动作前延时间(ms)	0～980	10	按到上定位后进入拨扦线动作前的间隔时间
【045. W2】	拨扦线动作时间(ms)	0～990	40	拨扦线的动作时间
【046. WF】	拨扦线动作结束后进入到抬压脚时序前的间隔时间	0～990	50	拨扦线动作结束后进入到抬压脚时序前的间隔时间
【047.UEG】	停针位置的调整	0～359	5	独调板正位针位置
【048. DD】	自动测试选择	ON/OFF	OFF	ON：开始自动测试 OFF：关闭自动测试
【049.ANU】	开机后自动找上针位	ON/OFF	ON	ON：开机电源后，自动找到上针位信号 OFF：无作用
【050. HL】	车头最高速度限制	100～9999	3800	车缝时的最高速度总速制
【051. PDL】	高速度范围调整	0～100	20	调整高速相应灵敏度，适用于高速、连续缝制。
【052. PDH】	低速度范围调整	0～100	10	调整低速相应灵敏度，适用于低速、单计缝制。
【053.VER】	控制器软件版本号			显示当前控制器的软件版本
【054.ASL】	软启动选择	ON/OFF	OFF	ON：开启软启动 OFF：关闭软启动
【055. VOL】	当前主板电压显示			显示当前上报电压
【057. DEG】	下针位位置调整	0～200	75	下针位位置调整
【061. ANG】	电机编光角度	0～359	96	电机编光角度
【063. FVO】	电压错误不报错	ON/OFF	OFF	ON：电压错误不报错 OFF：电压错误报错
【065. ANT】	电机编光角度测试	0～1	0	电机编码角度测试
【066. P】	电机停止参数1	1000-5000	3000	不同类型机头可适当调整此参数
【082. CO】	剪刀电磁铁个脚出力时间(ms)	0～999	150	剪刀开始动作时，全脚出力的动作时间
【083. CC】	剪刀出力动作的周期信号(%)	0～99	25	剪刀动作时，以周期性省电输出，避免剪刀电磁铁发烫

【084. PLD】	轻后踏持续时间大于 PLD 时间后，才起效果	0～200	200	轻后踏持续时间大于 PLD 时间后，才起效果
【085. CKM】	剪刀信号检测功能选择	0～1	1	选择“0”不检测，“1”检测。
【01. CP】	电机停止参数2	1000-5000	3000	不同类型机头可适当调整此参数
【003.UMT】	最大抬压脚允许时间(S)	1-30	10	防止抬压脚长时间吸合，发烫
【109.COC】	剪刀缝人开力时间力度(%)	0-100	100	调整缝人开力时间力度大小
【110.COT】	剪刀放闭时的力度(ms)	0-100	40	调整高刀放开力度大小
【111.FOC】	抬压脚全段时间与百分比(%)		100	数值越大，力矩越大
【112.FOT】	抬压脚放开时的力度（ms）		20	数值越大，放开越快
【127.N】	停针停止时锁定力度		300	数值过大或过小会造成停针位不准

附录 4

七段显示器字体与实际值对照表

数值字体部分：

实际数值	0	1	2	3	4	5	6	7	8	9
显示字符	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
显示字母	A	b	C	d	E	F	G	H	I	J
实际字母	K	L	M	N	O	P	Q	R	S	T
显示字母	K	L	M	n	o	P	q	r	S	T
实际字母	U	V	W	X	Y	Z				
显示字母	U	V	W	X	Y	Z				

Industrial Sewing Machine Digital AC Servo System

BFK User Manual

Security instructions

1. The user should carefully read this operation manual before installing and using this product.
2. This product should be installed or operated by personnel receiving proper training.
3. All power supply should be turned off when installation is implemented and do not operate with electricity.
4. Implement according to the instruction book for all instructions marked with ⚠ to avoid unnecessary damage.
5. Before connecting the power line, the voltage should be determined to be less than AC250V and conform to the rated voltage value stipulated by this operation.
6. When firstly switch on this machine after installation, firstly cut off tangent function, operate the sewing machine by lightly pedaling and in low speed, and check whether the rotation direction is correct and rotation is steady or not.
7. Please turn off system power supply before implementing the following operations:
   - ◆ Insert or extract any attachment plug on the controller.
   - ◆ Lift up the head of the sewing machine.
   - ◆ The machine sits idle.
   - ◆ Thread a needle.
   - ◆ Repair the machine or make any adjustment of this machine.
8. Repair or maintenance of high level should be implemented only by trained mechanical and electrical technicians.
   All elements for repair could not be used until being provided or approved by our company.
9. Please stay away from HF electromagnetic wave and radio transmitter etc, when using this product to avoid generated electromagnetic wave disturbing the servo driver and causing malfunction.
10. Requirements of production application environmental temperature and humidity:
    - ◆ Do not operate it in the room temperature of over 45℃ or less than 5℃.
    - ◆ Do not operate it beside the heating installation (electric heater).
    - ◆ Do not operate it in the place of direct sunlight or outside.

1. Product specification

1.1 Use environment requirement

Normal operating environmental temperature:5℃~45℃
Normal operating environmental humidity: 10%~90% (no condensation)
Rated voltage: 220V±10% 50(60) HZ
Working environment: the working environment of this control system should not contain flammable, explosive, toxic, spray or corrosive medium
Instant power failure: less than 20ms at rated voltage
System grounding: less than 4Ω

1.2 Product specification

Motor output power: 550W, 750W
Sewing speed: 100r/min~4500r/min settable
Speed regulation method: infinitely variable speed, or automatically fix speed to operate
Solenoid signal output port: 4 signals, including tangent, sweeping line,foot lifter solenoid and suction solenoid
Error protection: judgment time of blocking protection of over current, shortcut and blocking etc.: 3sec

2. Installation and debugging

2.1 Installation

⚠ Note: Firstly turn off the power when installing or dismantling any subassembly.

2.1.1 Installation of the control cabinet

First step: fasten the control cabinet with self-tapping screw according to the size in figure 2-1.
The control cabinet has been installed as shown in figure 2-2.

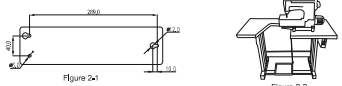


Figure 2-1

Figure 2-2

2.1.2 System wiring

■ Connection of signal line

Refer to figure 2-3 for the connection of the control cabinet with motor synchronization sensor components, operation panel and power line etc. Insert the plugs of various lines into corresponding sockets on the control cabinet. Check whether plugs are plugged or not after Installation.

HEAD ELECTROMAGNET			
1	Cut-line	9	Cut-line
2	Sweep-line	10	Sweep-line
3	Power	12	GND
4	LED Light+	11	LED Light-
5		13	
6	Suction(Optional)	13	Suction(Optional)
7	Hall signal	14	GND

PEDAL			
1	Signal into	4	Switch signal-1
2	5V Gnd	5	Switch signal-2
3	+5V	6	+

PROTECTS			
1	+	3	Signal into
2	+	4	Gnd

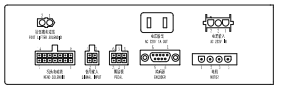
MOTOR POWER	
E	Earth
B	Motor -A
D	Motor -B
I	Motor -C

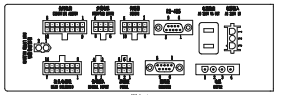
Actuator			
1	+24V	9	Output eight
2	+24V	10	Output seven
3	+24V	11	Output six
4	+24V	12	Output five
5	+24V	13	Output four
6	+24V	14	Output three
7	+24V	15	Output two
8	+24V	16	Output one

Stepper motor			
1	Stepper motor-A+		
2	Stepper motor-A-		
3	Stepper motor-B+		
4	Stepper motor-B-		
5	Stepper motor-A+		
6	Stepper motor-A-		
7	Stepper motor-B+		
8	Stepper motor-B-		

Sensor			
1	Digital GND	6	Sensor power supply (5V/12V)
2	Sensor power supply (5V/12V)	7	Input signal one
3	Digital GND	8	Input signal two
4	Digital GND	9	Input signal three
5	Sensor power supply (5V/12V)	10	Input signal four

RS-485			
1		1	
2		2	
3	RS-485B	3	RS-485A
4		4	
5	Digital GND	5	


图2-3


图2-4

2.1.3 连接线束

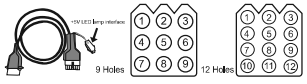


Figure 2-3

9 Holes		12 Holes	
1 2 feet	Cut-line	1 3 feet	Cut-line
3 4 feet	Sweep-line	4 6 feet	Sweep-line
9 feet	GND	10 12 feet	Cut-line protection

⚠ Note: Please check whether plugs match sockets and whether insert direction or needle is correct when failing to insert plugs with normal strength.

■ Installation of ground connection

The earth terminal of controller power plug needs reliable grounding.

⚠ Note: All power lines, signal lines and grounding lines should not be pressed down by other objects or excessively distort when grounding in order to ensure safety!

2.2 Installation notes

2.2.1 When the footplate connecting rod is installed, the end of the connecting rod connecting to the controller is generally fixed on the outside fixed orifice of footplate sensor rocker. If the footplate is too light, fix the connecting rod to the middle or innermost fixed orifice on the rocker. The length of the connecting rod is adjustable. Generally, the adjusted length of the connecting rod should make a 30-degree angle between the footplate and the ground.
2.2.2 The operation panel is fixed to the support which is fixed to the hand piece. Positions of two mounting screws are customized by the sewing machine factory.
2.2.3 See clearly the label text beside the controller socket when connecting to avoid mistake. Please pay attention: 1. Insert plugs in the right direction; 2. please do not use this controller and immediately contact the supplier when plugs do not match sockets or they are not consistent with each other; 3. all signal lines should be away from sewing hand wheel to avoid failures out of signal lines abrasion. Bundling up signal lines is recommended.

3. Function introduction


Figure 1 Operation panel

3.1 Sewing pattern selection

功能	标签	本领域补充说明
USER PARAMETER SETTING KEY	P	Users enter the parameters, select the parameters of the button
ENTER PARAMETER CONFIRMATION KEY	S	After selecting the parameters, enter and determine the key to save
Add keys	▲	User select parameter backward key
Cut keys	▼	User selection parameter decreasing key
Free sewing/fixed needle sewing		Shift key of free sewing and fixed needle sewing(Lamp opening: free sewing,Lamp off:fixed needle sewing.)
Cut-line		Opens or close the cut-line to the function.
Trigger automatic		Under the condition of the fixed needle, the automatic trigger is turned on or off.
Stopping needle setting		Up and down position selection
start sewing with slow speed		Opens or close to start sewing at a slow speed
semi-automatic foot lifter		Opens or close semi-automatic foot lifter function
automatic foot lifter		Opens or close automatic foot lifter function

3.2 Restore factory settings

1) Firstly shut down power switch
2) Long press [P] and turn on power switch, the interface of "030.MAC" appears
3) Press [S] , the interface of "MAC. 0" appears. Press ( ) key wait for all the indicator lights put out after 5 seconds

3.3 Common parameters setting

3.3.1 How to enter into parameter pattern area of various sections

Parameter pattern		Operation mode	Appearing interface	Selectable parameter range
Section 1	Parameter pattern A	In general pattern, directly press [P] and hold 2sec.		Selectable range 001~029
Section 2	Parameter pattern B	Long press [P]+ turn on power supply		Selectable range 030

Appendix 1

Fault phenomenon and processing countermeasures

Serial number	Fault phenomenon	Processing method and steps
1	Processing before repair	1. When the controller fails, first of all, to restore the factory settings
2	Not trim thread	1. Does the trim switch on the operation panel start or not? Please start it if it is off. 2. Please pedal backward the footplate sensor to confirm whether motor hand wheel is rotating or not. If not, please check whether footplate sensor contact point is in good contact. If yes, please change footplate. If not, please adjust it with a pincet. 3. If motor hand wheel could rotate, please check whether there is pull-in sound of trim thread electromagnet. If yes, there is mechanical fault of trimming device. 4. If there is no sound, check whether electromagnet plug (1) and (8) contact pin are in good contact or not. Please adjust them if not. 5. If in good contact, the trim thread electromagnet is broken and please change it. 6. If the electric cabinet is not broken, the trim thread electromagnet damages and please change it.
3	Not sweep thread	1. Does the trim switch on the operation panel start or not? Please start it if it is off. 2. Please check whether sweep switch on the sewing machine head turns on or not ? Please start it if it is off. 3. Please check whether electromagnet plug (2) and (9) contact pin are in good contact or not. Please adjust them if not. 4. If in good contact, change the electric cabinet with alternation method. Please change the electric cabinet if it is broken. 5. If the electric cabinet is not broken, the sweep thread electromagnet damages and please change it.
4	Pedal not work	1. The operation panel display is normal while pedal does not work, which may result from unconnected footplate sensor connector or broken footplate sensor.
5	Pedal unstable	1. Are the footplate sensor and electric cabinet contact point sometimes in bad contact? If in bad contact, please adjust it. 2. Check whether the lifting-up switch is in bad contact or not. If in bad contact, please adjust it with a pincet. 3. If in good contact, please change the footplate sensor. 4. If there is no fault of the footplate sensor, the electric cabinet is broken, please change it.

6	The hand wheel of the sewing machine is reversed, then "08" error appears	1. Check whether the motor coding disc connector is in good contact. If not, please adjust contact point. 2. If in good contact, press "P" to start the machine, press "P" again to adjust parameter to item 65, press "S" to enter into item 65, press "+" under "0", the value "1" is displayed and the motor starts electrical degree test (the motor will interruptedly rotate) and automatically update the electrical degree. After the motor stops rotating, press "P" to adjust parameter to item 61, press "S" to enter into item 61, check the value which is within the range (85-105) and the motor will be broken if it is out of range. Please change the motor if it is broken. 3. If there is no fault of the motor, the electric cabinet is broken, please change it. 4. Connection between the motor and the electric cabinet of different brand and model cause mismatch.
7	Report "08" error	1. Rotate the machine head to check whether the motor hand wheel gets stuck or not, If yes, firstly rule out mechanical failure of the machine head. 2. If the rotation is easy, please check whether the motor coding disc connector and motor power connection become flexible. Motor power supply is inserted in the opposite direction,please adjust them. 3. If in good contact, check whether the network voltage is too low or the rotate speed is too fast, If yes, please adjust them. 4. If in normal condition, please change the electric cabinet.
8	Report "FF.FE" error	1. If in good contact, please change the operation panel. 2. If there is no fault of the operation panel, the electric cabinet is broken, please change it. 3. In addition, connection between operation panel and electric cabinet of different version number will cause " FF " error.
9	Report "09" error	1. Check whether the motor coding disc connector is in good contact or not, If not, please adjust the contact point, 2, If in good contact, change the motor with alteration method. Please change the motor if it is broken. 3. If there is no fault of the motor, the electric cabinet is broken, please change it.
10	Report "08" error	1. Do the motor coding disc connector and motor power connection become flexible? If not, please adjust the contact point. 2. Motor fault appears, please change it. 3. Check voltage fluctuation. Frequent voltage fluctuation will cause this error. 4. The electric cabinet is broken, please change it.
11	Report "1A" error	1. The network voltage is low, adjust the parameter to item 55, enter the parameter to check busbar voltage, and give an alarm if the value is less than 230. Please stabilize mains voltage. 2.The parameter P63 should be replaced by" on"
12	Report "19" error	1. The network voltage is high, adjust the parameter to item 55, enter the parameter to check busbar voltage, and give an alarm if the value is less than 380. Please stabilize mains voltage. 2.The parameter P63 should be replaced by" on"
13	Report "14" error	1. Electromagnet current protection, electromagnet connection are broken or electromagnet damages. Please change them. 2. Machine is bad, replace.
14	Report "15" error	1. The shear line protection device did not return or change P85 item parameter to "0"
15	Report "18" error	1. Instant voltage is too high, turn off the controller and start it again. 2. The discharge resistance inside the electric cabinet is broken, please change the electric cabinet. 3. The parameter P63 should be replaced by" on"
16	Report "11" error	1. Turn off system power supply, Check whether the motor sensor connector becomes flexible or falls off. Restart the system after fixing it. If it still can not work normally, please change the controller and inform the factory.
17	Report "21" error	1. Electrical resistance is big, check the mechanical parts of the motor is stuck

18	Report "24" error	1. Motor moment reversal or no-load rotation, shutdown retry or replace the motor

Note:
- ■ **Turn off the power supply before dismantling and installing any components of the controller.**
- ■ **Do not modify button during sewing process.**
- ■ **After setting parameters, sewing could not be done until the data on display screen get back to initial state.**
- ■ **Do well daily cleaning work to avoid system fault out of dust accumulation or other unfavorable working environment.**

Appendix 2

[Parameter pattern A] technician parameter list

Parameter code	Content instruction	Range	Default value	Content value designation instruction and label
【001. H】	Maximum rotate speed (spm)	100~9999	3500	Maximum speed adjustment of sewing
【002. SLM】	Pattern selection of starting sewing at a low speed	A/T	T	A: lightly pedal the footplate forwards, i.e. automatically starting sewing at a low speed T: automatically start sewing at a low speed the time after finishing trim action
【007. S】	Speed of starting sewing at a low speed (spm)	100~2000	1200	Speed adjustment of starting sewing at a low speed
【008.SLS】	Pin times of starting sewing at a low speed	0~99	2	Pin times setting of starting sewing at a low speed
【009. A】	Automatic pin sewing speed (spm)	100~8000	2200	Pin sewing speed adjustment In the case of auto starting
【010.ACD】	Stirring thread and blowing selection		OFF	OFF means stirring thread,ON means blowing
【026.UD】	Blowing time(special for blowing)		500	The larger the value, the longer the time
【028. SP】	Sewing speed display			Speed value of current actual sewing is displayed

Appendix 3

[Parameter pattern B] system operator parameter list

Parameter code	Content instruction	Range	Default value	Content value designation instruction and label
【030.MAC】	Restore default value	0~1	0	Default value is 0, after which is switched to 1, restore factory setting.
【031.SPD】	Automatically test running time (s)	1~250	5	It is effective when parameter 048.DD is set ON
【032.TST】	Automatic test Interval (s)	1~250	3	It is effective when parameter 048.DD is set ON
【033. L】	Low speed (spm)	100~500	200	Adjustment of low speed
【035.FO】	Action time of presser full in:tial efforts (ms)	0~990	150	Full effort action time in the case of presser action
【036.FC】	Periodic signal of presser effort action (%)	10~90	35	At the moment of presser, periodically electricity -saving output to avoid presser heating

【037. FD】	Delay starting motor and ensure presser put down time	0~990	200	Delay starting time at the moment of pedaling to confirm presser
【038.HHC】	Cancel lifting presser function in the case of semi-pedaling	ON/OFF	OFF	ON: semi-pedaling cause impossible lifting presser action OFF: semi-pedaling cause possible lifting presser action
【040. T1】	Trim action time (ms)	0~990	0	Interval of starting trimming action after finding up position
【041. T2】	Trim action time (ms)	0~990	100	Trim action time
【042.LI】	Delay of air blowing after presser foot lifting (special for air blowing)		300	The larger the value, the longer the pause time
【044. W1】	Delay time before stirring/sweeping thread action (ms)	0~980	10	Interval of starting stirring/sweeping thread action after finding up position
【045. W2】	Stirring/sweeping thread action time (ms)	0~990	40	Stirring/sweeping thread action time
【046. WF】	Action time before presser action (ms)	0~990	50	Interval of starting lifting up presser action after finishing stirring/sweeping thread action
【047.UEG】	Adjustment of needle position	0~359	5	Finely adjust needle position
【048. DD】	Automatic test selection	ON/OFF	OFF	ON: start automatic test OFF: close automatic test
【049.ANU】	Automatically find up needle position after starting the machine	ON/OFF	ON	ON: automatically find out up needle position signal after turning on the power supply OFF: inaction
【050. HL】	Maximum speed limit of the head	100~9999	3800	Maximum speed total limit in the case of sewing
【051. PDU】	High-speed range adjustment	0~100	20	Adjust corresponding sensitivity of high speed, applicable to high-speed and continuous sewing.
【052. PDD】	Low-speed range adjustment	0~100	10	Adjust corresponding sensitivity of low speed, applicable to low-speed and single-needle sewing.
【053.VER】	Version number of controller software			Display software version of current controller
【054. ASL】	Soft start selection	ON/OFF	OFF	ON: start soft start OFF: close soft start
【055. VOL】	Current main board voltage displaying			Display current main board voltage
【057. DEG】	Down needle position adjustment	0~200	75	Down needle position adjustment
【061. ANG】	Motor deviation angle	0~359	96	Motor deviation angle
【063. EVO】	Voltage error does not report error	ON/OFF	OFF	ON: voltage error does not report error OFF: voltage error reports error
【065. ANT】	Voltage deviation angle test	0~1	0	Voltage deviation angle test
【066. P】	Stop motor parameters 1	1000-5000	3000	Different types of machines can be appropriate to adjust this parameter
【082. CO】	Full effort time of scissors electromagnet (ms)	0~999	150	Full effort action time at the moment of scissors action
【083. CC】	Periodic signal of scissors effort action (%)	0~99	25	At the moment of scissors action, periodically electricity-saving output to avoid scissors electromagnet heating

【066. P】	Stop motor parameters 1	1000-5000	3000	Different types of machines can be appropriate to adjust this parameter
【082. CO】	Full effort time of scissors electromagnet (ms)	0~999	150	Full effort action time at the moment of scissors action
【083. CC】	Periodic signal of scissors effort action (%)	0~99	25	At the moment of scissors action, periodically electricity-saving output to avoid scissors electromagnet heating
【084.PLD】	Response time of lightly backward pedaling	0~200	200	It is effective when lightly backward pedaling duration is more than PLD.
【085.CKM】	Scissors signal test function selection	0~1	1	No test when selecting "0" while test when selecting "1".
【101. CP】	Stop motor parameters 2	1000-5000	3000	Different types of machines can be appropriate to adjust this parameter
【103.UMT】	Biggest presser foot allows time (S)	1-30	10	Prevent the presser foot off for long, hot
【109.COC】	Intensity of scissors maximum output time (%)	1-100	100	Adjust the size scissors income dynamics
【110.COT】	The magnitude of the scissors back when (ms)	1-100	40	Adjust the scissors to let go of the strength
【111.FOC】	The force when presser foot lifting in full process sing time(%)		100	The greater the value, the greater the force
【112.FOT】	The force when lifting presser foot and relea sing(ms)		20	The larger the value, the faster the release
【127.N】	The force when stoppi ng needle locking		300	Too large or too small value will cause inaccurate needle stop

Appendix 4

Table of comparisons between seven-segment display and actual value

Value font:

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

English font:

Actual letter	A	B	C	D	E	F	G	H	I	J
Display letter	A	b	C	d	E	F	G	H	I	J
Actual letter	K	L	M	N	O	P	Q	R	S	T
Display letter	k	L	!	n	o	P	q	r	S	t
Actual letter	U	V	W	X	Y	Z				
Display letter	u	v	W	H	y	Z				

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C007KP/BFK.NOV.2026