工业缝纫机数控交流伺服系统简易操作说明

1. 安全事项

■ 为了安全、正确地使用工业缝纫机伺服系统及其附属设备，使用前务必认真阅读 【安全事项】。
在熟记设备知识、安全信息及注意事项后进行使用。
■ 阅读后，请务必常备以便查询。

以下列出在使用操作工业缝纫机伺服系统过程需要注意以及禁止的各方面问题，另外，可能还会发生书中所载内容以外的严重后果，敬请严格遵守。

重要 ■ 在使用前请务必认真阅读以下安全事项，避免一切在以下内容中所涉及的注意问题以及严禁事项！

1.1 关于工作环境

1. 电源电压请遵照产品铭牌所示的电压范围接入。
2. 请远离电磁波干扰源，以免所产生的电磁波干扰影响本系统而发生错误动作。
3. 请勿将本设备置于温度低于5℃或高于45℃的环境内使用。
4. 请勿将本设备置于湿度低于30%或高于80%的环境内使用。
5. 请尽量对运行环境进行除尘处理。
6. 保持设备周围环境通风，勿将设备置于发热体周围运行。

1.2 关于设备安装

1. 请严格按照说明书所示对本设备的各个部件进行安装。
2. 当需要更换针线、翻转机头、插接连接插头时，必须断开电源。
3. 电源线的接地线必须以适当大小的导线和接头连接到生产工厂的系统接地线，此链接必须被永久固定。

1.3 关于运行

1. 首次开机通电时，请以低速运行方式检查转动方向是否正确。
2. 接通电源开关时请勿进行任何脚踏操作。
3. 在正式进行运行工作之前，请务必确认所的设定参数、开关是否正常运作。
4. 当缝纫机在运行过程中请勿触摸飞轮，机针等运动部件。
5. 当发生警报时，应排除原因，并确保安全后，再重新进行报警设定，重新进行运行。
6. 不可频繁打开或关闭本设备电源。

1.4 关于保养

1. 控制箱内有高压电，开启电控箱盖必须断电5分钟以上。
2. 保养及维修时，必须由经过专业培训的人员进行操作。
3. 维修所需的所有零部件，必须由本公司提供或认可，方可使用。

1.5 技术规格

额定输入电压	220V±10%
额定输入频率	50/60HZ
额定输出功率	550W/750W
电机最大转速	5000rpm/3500rpm

2. 上针位设置与调整

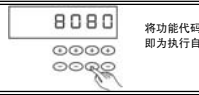
重要 在系统安装好后首次上电运行前，必须确保将上针位设置到合理区域，忽略或者错误设置此步骤，将会导致缝纫机无法正常运行，出现断针，剪不断线，机械卡死等现象。

1

1. 在关机状态，按住S键，同时开启电源为系统上电，系统启动后即进入特殊功能设置模式。

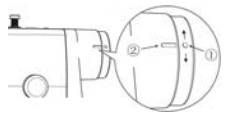
2. 进入特殊功能设置模式后，显示屏将出现功能代码选择界面，同时可以通过←键来选择代码号。

2



将功能代码设置为：8080
即为执行自动上针位设置的代码。

3



手动转动手轮，调整到所需的上针位(即拔线杆最高位置）或者直接将手轮上的上针位标志点① 与缝纫机机头的标志点② 对准。
此时缝纫机机针的位置为出厂时的标准上针位。

4

调整好所需上针位后，按S键即可执行该功能（此时显示屏闪烁，电机停在所设上针位上，表示完成上针位的设定）步骤(3)所调的针位将被设置为上针位，上针位的设置过程完成。

（备注：以下为部分机型适用，具体机型请咨询客服）
若设置完成后的位置与步骤(3)调整的位置有差距，可以进入步骤(5)进行手动微调。

5

（备注：以下为部分机型适用，具体机型请咨询客服）
通过上下加减键进行上针位的微调. 按下按键的同时，电机会实时微动，直观的显示是否调整到位。

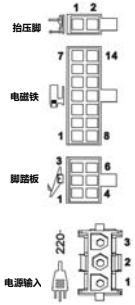
当微调到理想位置时，踩下脚踏检测停针位是否为所设位置。可重复微调，直至到达理想位置为止。至此即完成上针位的设置。

3. 操作说明

3.1 按键显示功能对照表：

功能	按键	说明	显示屏图标
功能参数编辑键	P	进入或退出功能参数的编辑；在缝纫模式状态时按键2～3秒进入参数编辑状态，在参数编辑状态按下键2～3秒退出参数编辑状态返回缝纫模式状态	—
参数查看保存键	S	对所选参数号内容进行查看和保存；选择好参数号后按此键可以进行查看和修改操作，修改参数值后按此键则退出并保存参数	—
速度增减键	▲	加速键：提高运行速度	—
	▼	减速键：降低运行速度	—
参数增减键	⊕	增大参数键	—
	⊖	减小参数键	—
切换键	◯	针数、参数设置切换键	—
自动缝纫功能键	◯	（只在定长缝中有效） 当触发功能键激活时，显示屏显示图标。触发脚踏，自动走完设定的缝纫过程	
停针位置选择键		选择停车时的上下停针位，默认状态为上停针位。当显示屏显示图标时表示选择上停针位	
慢速启动设定键		慢速启动设定，当显示屏显示图标时，启动慢速启动功能。	
中途停车自动抬压脚设定键		设置中途停车时是否自动抬压脚，当显示屏显示图标时，激活中途停车自动抬压脚功能	
剪线自动抬压脚设定键		剪线后自动抬压脚，当显示屏显示图标时，激活剪线后自动抬压脚功能	
连续回缝设定键		连续回缝功能设定，当显示屏显示图标时，激活连续回缝（W缝）功能	
自由缝设定键		自由缝功能设定，当显示屏显示图标时，激活自由缝功能	
起始回缝设定键		起始回缝功能设定，按一次激活起始单回缝，按两次激活起始双回缝。连续按键，将在起始单回缝和起始双回缝间来回切换	
终止回缝设定键		终止回缝功能设定，按一次激活终止单回缝，按两次激活终止双回缝。连续按键，将在终止单回缝和终止双回缝间来回切换	
定长缝设定键		执行E段定长缝，当显示屏显示图标时，激活E段定长缝功能，连续按键，将循环切换四段缝，自定义多段缝模式，显示屏显示相应图标	
剪线开关		设定是否剪线功能，当显示屏显示图标时，激活剪线功能	
提针与补针		执行补针，提针功能，详见功能说明	—
夹线器开关		设定是否开启夹线器功能，当显示屏显示图标时，激活该功能	

4. 系统接线说明



抬压脚		
	1	P+32V
	2	抬压脚电磁铁

脚踏板		
	1	+5V
	2	数字地
	3	-
	4	启动信号
	5	剪刀信号
	6	加速信号

电源输入		
	1	AC220
	2	AC220
	3	接地

一体机电控-电磁铁接线

电磁铁		
	1	+32V
	8	剪线电磁铁
	2	+32V
	9	夹线/扫线电磁铁
	3	32V数字地
	10	补针开关
	4	灯5V地
	11	灯+5V
	5	32V数字地
	12	回缝开关
	6	P+32V
	13	回缝电磁铁
	7	P+32V
	14	松线电磁铁

分体机电控-电磁铁接线

电磁铁		
	1	+32V
	8	剪线电磁铁
	2	+32V
	9	夹线/扫线电磁铁
	3	32V数字地
	10	补针开关
	4	灯+5V
	11	灯5V地
	5	32V数字地
	12	回缝开关
	6	P+32V
	13	回缝电磁铁
	7	P+32V
	14	松线电磁铁

5. 操作模式选择

5.1 一般缝纫模式

正常对系统上电后，默认进入一般缝纫模式。在此模式时，用户可在已设定好技术参数的情况下选择使用各种缝纫功能。在此模式时，用户可依据需要切换各种缝纫功能进行缝制工作，但无法对系统各类技术参数进行修改和设置。

5.2 用户参数设置模式

在用户参数设置模式时，可以根据缝制需要调整各类缝纫功能的技术参数，参数设定步骤如下：

1. 在缝纫模式下按P键2～3秒进入用户参数设置模式。
2. 进入用户参数模式后默认参数号选择界面，同时可以通过+ -键来选择参数号。
3. 选择好参数号后按下S键进入参数修改界面进行参数值查看，可以通过+ -键来设置参数值 。
4. 设置参数值后按S键保存参数值并退出至参数号选择界面。
5. 按P键2秒 退出系统参数设置模式，返回一般缝纫模式

5.3 系统参数设置模式

在系统参数设置模式时，可以根据缝制需要调整各类电磁铁参数以及系统设置，参数设定步骤如下：

1. 在关机状态，按住P键，同时开启电源为系统上电，系统启动后即进入系统参数设置模式。在此模式下，可以对系统参数进行修改，同时也可以对用户参数进行修改。
2. 通过+ -键来选择参数号，按下S键进入参数修改界面进行参数值查看和修改。
3. 设置参数值后按S键保存参数值并退出至参数号选择界面。
4. 按P键2秒退出系统参数设置模式，返回一般缝纫模式。

用户参数表 V1.4

参数号	名称	出厂值	范围	说明
Fn－01	最高转速(r/min)	3600	100～5000	最高转速设定
Fn－02	加速曲线调整(%)	80	10～150	控制器的加速爬升斜率设定
Fn－03	起始回缝速度(r/min)	1800	150～2800	起始回缝的速度设定
Fn－04	终止回缝速度(r/min)	1800	150～2800	终止回缝的速度设定
Fn－05	连续回缝速度(r/min)	1800	150～2800	连续回缝的速度设定
Fn－06	慢速启动速度(r/min)	300	150～2800	慢速启动的速度设定
Fn－07	慢速启动针数（针）	2	0～99	慢速启动的针数设定
Fn－08	定长缝自动运行速度(r/min)	3200	300～4500	触发自动功能键按下时的速度设定
Fn－09	定长缝后自动执行终止回缝功能	1	0～1	1：执行完最后一段定长缝后，将自动执行终止回缝。 0：执行完最后一段定长缝后，将无法自动执行终止回缝功能，必须重新当作前或全后踏动作始可
Fn－10	点动倒缝时功能模式选择	1	0～1	1：JUKI方式（即在车缝中和停止时均执行倒缝动作） 0：BROTHER方式（即在车缝中执行倒缝动作，在停止时执行补针动作）
Fn－11	起始回缝运行模式	1	0～2	0：受踏板控制，可任意停止与起动 1：轻触踏板，自动执行回缝动作 2：前倒针精准加回缝模式
Fn－12	起始回缝结束模式	1	0～1	1：起始回缝完成后，自动连续下一段功能； 0：起始回缝段针数完成后自动停止
Fn－13	起始回缝补偿-1	60	1～150	起始回缝A段针迹补偿
Fn－14	起始回缝补偿-2	60	1～150	起始回缝B段针迹补偿
Fn－15	终止回缝运行模式	1	0～2	0：受踏板控制，可任意停止与起动 1：轻触踏板，自动执行回缝动作 2：后倒针精准加回缝模式
Fn－16	终止回缝补偿-1	60	1～150	终止回缝C段针迹补偿
Fn－17	终止回缝补偿-2	60	1～150	终止回缝D段针迹补偿
Fn－18	连续回缝运行模式	1	0～2	0：受踏板控制，可任意停止与起动 1：轻触踏板，自动执行回缝动作 2：连续倒针精准加回缝模式
Fn－19	连续回缝补偿-1	60	1～150	连续回缝A、C段针迹补偿
Fn－20	连续回缝补偿-2	60	1～150	连续回缝B、D段针迹补偿
Fn－21	停针位置选择	1	0～1	无外接键盘时功能设定：1（上停针）/ 0（下停针）
Fn－22	慢速起缝功能设定	0	0～1	无外接键盘时功能设定：1（开启）/ 0（关闭）
Fn－23	剪线自动抬压脚设定	0	0～1	无外接键盘时功能设定：1（开启）/ 0（关闭）
Fn－24	中途停车自动抬压脚设定	0	0～1	无外接键盘时功能设定：1（开启）/ 0（关闭）
Fn－25	触发自动功能设定	0	0～1	无外接键盘时功能设定：1（开启）/ 0（关闭）
Fn－26	自动扫线/夹线功能设定	3	0～3	0（关闭）/ 1（启动扫线功能）/ 2（启动夹线功能）/3（键盘控制夹线功能）
Fn－27	夹线器动作机械角度	180	1～300	夹线器动作角度
Fn－28	夹(扫)线器电磁铁输出力度(%)	80	20～100	夹(扫)线器电磁铁输出力度
Fn－30	剪线余线长度控制	180	120～360	控制剪线后余线的线头长度
Fn－31	脚踏板剪刀灵敏度	0	0～50	五线脚踏控制器： 0：全后踏剪刀 / 1：半后踏剪刀 / 2：三联踏板 三线脚踏控制器： 3-50 数字越小，剪刀灵敏度越高
Fn－32	精准加固缝停顿驶捷度	100	0～180	数字越大越快捷，数字越小越迟缓
Fn－35	抬压脚软下降时间	0	0～1000	时间越长压脚下降越平缓
Fn－38	存储器[EEPROM]选择	0	0～2	0（内存储器）/1（外存储器定位和回缝参数）/ 2（外存储器定位参数）
Fn－39	车缝完成件数显示	—	0～9999	车缝完成件数显示

不同机型默认参数有差异，请依据恢复出厂设置为标准

系统参数表 V1.4

参数号	名称	出厂值	范围	说明
Fn－40	电机转动方向设定	—	—	保留
Fn－41	电机停止时，刹车锁住功能	0	0～1	1：电机停止时，刹车锁住车头 / 0：无作用
Fn－42	自动运行测试功能	0	0～1	1：启动 / 0：关闭，设置1后，踩下脚踏启动
Fn－43	电机自动运转测试的总限时间(hr.)	8	1～800	当 Fn－42=1 时有效 电机自动运转测试的总限时间
Fn－44	测试时电机运转时间(s)	3	1～30	当 Fn－42=1 时有效 电机自动运行测试周期内的工作时间
Fn－45	测试时电机停止时间(s)	3	1～60	当 Fn－42=1 时有效 自动运行测试时，每次的间隔时间
Fn－46	最低速度设置(r/min)	300	100～400	电机最低速度限制调整
Fn－47	切线、停车的速度设定(r/min)	300	100～400	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
Fn－48	抬压脚、回缝电磁铁全额初始出力的动作时间(ms)	300	0～990	抬压脚、回缝电磁铁开始动作时，全额出力动作时间
Fn－49	回缝电磁铁动作的周期信号(%)	30	10～90	回缝电磁铁动作时，以周期性省电输出，避免抬压脚电磁铁发烫
Fn－50	延迟马达启动，保护抬压脚下放时间(ms)	50	0～990	踩下时延迟启动时间，以配合自动抬压脚放下的确认
Fn－51	半后踏释放剪刀抬压脚	3	0～4	0：（关闭）/1：（半后踏触发）/2（半后踏保持）/3（半后踏跟随）/4（禁用中途半后踏抬压脚）
Fn－52	安全开关功能	1	0～1	1：开启安全开关功能 / 0：关闭安全开关功能
Fn－53	切线动作前延迟机械角度(度)	180	120～250	找到上定位后进至切线时序前所需的间距机械角
Fn－54	切线动作完成前延迟机械角度(度)	360	250～360	切线时序所需的动作角度
Fn－55	扫线动作前延时时间(ms)	10	0～980	找到上定位后进至拨/扫线时序的间距时间
Fn－56	扫线动作时间(ms)	70	0～9990	拨/扫时序的动作时间
Fn－57	抬压脚动作前的延迟时间(ms)	50	0～990	拨/扫动作完后进至抬压脚时序前的间距时间
Fn－58	车缝停止时自动抬压脚上升维持时间(s)	3	1～20	车缝停止时自动抬压脚上升维持时间
Fn－59	上停针位停止时的位置调整(度)	15	1～30	微调修正上停针位停止时的角度位置（中心数值为15），数值减少时会提前停针，数值增加会延迟停针
Fn－60	下停针位停止时的位置调整(度)	180	140～220	微调修正下停针位停止时的角度位置，数值减少时会提前停针，数值增加时会延迟停针
Fn－61	上电后自动找上停针位	1	0～1	1：上电自动找上停针位 0：上电禁止找上停针位
Fn－62	正常停车速率(‰)	925	1～1999	调整正常停车速率
Fn－63	切线停车速率(‰)	925	1～1999	调整切线停车速率
Fn－64	回缝保护时间(s)	30	1～120	回缝电磁铁吸合时间限制， 保护电磁铁以及电路安全
Fn－65	低速最大输出扭矩(%)	40	10～80	低速最大输出扭矩
Fn－66	低速启动时间选择（上针位有效）	0	0～5	档位越高，启动加速越快 0为关闭低速启动时间调整功能
Fn－67	抬压脚电磁铁动作的周期信号(%)	30	10～90	抬压脚电磁铁动作时，以周期性省电输出，避免抬压脚电磁铁发烫
Fn－68	缝纫机(机头)保养周期时间(hr.)	0	0～9999	设置缝纫机(机头)保养周期时间 当输入【0】时，关闭保养提示功能
Fn－69	直驱上针位偏移角度(度x10)	—	0～3600	直驱上针位偏移角度（相对于[Z]信号）
Fn－70	系统故障信息代码	—	—	—
Fn－71	机头编码器脉冲数获取	—	0～1599	获取机头编码器脉冲数
Fn－72	工作机械角信息(度)	—	0～359	获取工作机械角信息
Fn－73	电磁铁输出电流(A)	—	0.0～9.0	获取电磁铁输出电流
Fn－74	脚踏板速度电平（V）	—	0.0～3.3	获取脚踏板速度电平
Fn－75	伺服系统(IO)输入监视	—	—	见注解①
Fn－78	缝纫机(机头)保养期内的累计运行时间(hr.)	—	0～9999	显示缝纫机保养期内的累计运行时间，当输入【0】时，可以清除累计运行时间，输入其它数值无作用
Fn－79	执行出厂参数初始化	—	—	见章节 6.1 出厂参数初始化

不同机型默认参数有差异，请依据恢复出厂设置为标准

注解 ① 关于 Fn－75 号参数 监视内容的显示说明
伺服系统(IO)输入监视以显示屏中后四位虚拟数码管的段位显示，
不同的段位点亮代表不同的含义，如下表图所示：

[01]	脚踏板前踏信号输入
[02]	脚踏板后踏信号输入
[03]	回缝控制开关输入
[04]	安全控制开关输入
[05]	(SYNUP)上针位同步输入
[06]	(SYNDN)下针位同步输入
[07]	(Hall)电机正尔(U)信号
[08]	(Hall)电机正尔(V)信号
[09]	(Hall)电机正尔(W)信号
[10]	母线电压过高信号
[12]	编码器(Z)信号

6. 辅助功能

6.1 出厂参数初始化

1. 首先进入系统参数模式，系统参数模式的进入方法参见 “5.3 系统参数设置模式”章节。
2. 进入系统参数模式后，将参数号调整到 Fn－79，按S键进入参数后显示屏会显示代码输入界面。
3. 在代码输入界面上输入不同的代码将执行不同的恢复方式，如右表所示：输入代码后，按S键执行恢复功能。

恢复参数方式的执行代码
输入(1111)：电控箱恢复默认参数
输入(5555)：操作面板恢复默认参数

6.2 加工件数统计

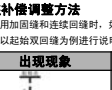
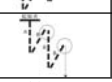
在一般缝纫模式下，长按S键，显示屏将显示加工件数统计。每一次缝纫周期结束，记为完成一件加工件。

6.3 电机实时速度监视

在用户参数设置模式或者系统参数设置模式界面下长按加速调节键 ▲ ，将做为电机转速监视功能。

6.4 针迹补偿调整方法

当在使用加固缝和连续回缝时，如果正缝和倒缝的针迹出现差异，可以通过调整倒缝电磁铁延时参数进行补偿。
以下将以起始双回缝为例进行说明，其中，A=4，B=4：

出现现象	调整方法
	A段针数超出设定数值，或A段最后一针变长、B段第一针变短，造成执行完B段针数后无法回到起始点时； 适当调大Fn-13号参数。
	A段针数少于设定数值，或A段最后一针变短、B段第一针变长，造成执行完B段针数后超出起始点时； 适当调小Fn-13号参数。
	B段针数超出设定数值，或B段最后一针变长、后续缝纫的第一针变短，造成执行完B段针数后超出起始点时； 适当调大Fn-14号参数。
	B段针数少于设定数值，或B段最后一针变短、后续缝纫的第一针变长，造成执行完B段针数后无法回到起始点时；适当调小Fn-14号参数。

■ 终止回缝参数：Fn-16 Fn-17，以及连续回缝参数 Fn-19 Fn-20 可参照上述方法调整

7. 故障处理与维护

当系统出现错误时，将以错误警报形式显示于显示屏上，用户可根据错误代码提示进行简单的故障处理。如果出现用户无法解决的故障，请及时与我们技术人员联系。报警显示如左图（Err-01）：

故障代码对应含义及解决方法如下表：

故障代码	代码含义	解决方法
Err-0	脚踏输入信号自检错误 （上电脚踩板故障测试）	1. 检查脚踏板的信号是否连接正常 2. 松开脚踏板，回复中立位置
Err-1	定位信号异常	上针位同步信号（手轮上的磁钢）异常
Err-2	EEPROM读/写数据错误	检查读卡器是否插好
Err-3	EEPROM内设置参数错误	上电重启
Err-4	过流、过压、超温、欠压	1. 关机30秒后重新上电检查是否正常。 2. 电机功率模块可能发生故障。 3. 检查是否发生瞬间干扰。
Err-5	直流母线电压超压	1. 关机30秒后重新上电检查是否正常。 2. 检测电源电压是否正常。
Err-6	电磁铁供电电源过流	1. 关机30秒后重新上电检查是否正常。 2. 关闭系统，检查电磁铁回路是否连接正常。
Err-7	堵转	关闭系统，检查缝纫机机械结构是否正常。
Err-8	电机编码器输出信号错误	检查电机输出信号线是否断线或者连接不良。
Err-9	同步器自检错误	1. 关闭系统，重新连接同步器。 2. 更换同步器。
Err-E	缝纫机(机头)保养提示	缝纫机运行时间达到所设置的保养周期，请对机头进行保养操作后，进入FN-78参数设0清除累计运行时间。
Err-F	安全开关警告	1. 机头被翻开。 2. 检查安全开关回路是否连接正常。

Industrial Sewing Machine AC Servo Control System Operation Instruction

1. Important Safety Instructions

- Using Servo Control system and its accessories safely and properly, be sure to read and get the safety instructions before you use the machine.
- Keep the manual for reference whenever necessary.

Keep strictly to the following instruction which should be noted and prohibited when using the machines. Also noted, there will be some serious accidents which is unlisted in the manual if violate the instructions.

Important

- Observe the following safety instruction before use the machine and avoid all the caution and prohibited items.

1.1 Operation Environment

1. Only connect the machine to the power supply which conformed to the specification listed in the label.
2. Keep away from the electromagnetic interference source to avoid malfunction.
3. Do not operate the machine under the site whose temperature is below 5℃ or above 45℃.
4. Do not operate the machine under the site whose related humidity is below 30% or above 80%.
5. Keep the machine out of the dust.
6. Keep away from heat and place the machine in the well ventilated environment.

1.2 Installation The Machine

1. Keep strictly to the manual to assemble all the part of the machine.
2. The power supply must be turned off when changing the needle, tilting the head of the machine and connecting/disconnecting the power plug.
3. It's necessary to ground the machine permanently and reliably with appropriate diameter wire and plug to the factory system ground.

1.3 Operation

1. Set the machine on low speed at the first turning on to check whether the rotation direction is correct.
2. Do not press the pedal at the moment the machine is connected to the power supply.
3. Do check the setting parameter and switch status before normal operation.
4. Do not touch the moving parts of the machine, such as hand wheel and needle, while the machine is in operation.
5. On alarm, it is necessary to troubleshoot and confirm the safety, reset the alarm parameter before rerunning the machine.
6. Do not turn on/off the machine power frequently.

1.4 Maintenance

1. As there are high voltage in the control cabinet, avoid to open the cabinet within 5 minutes after turning off..
2. Only the trained expert is allowed to maintain and repair the machine.
3. All the components for maintenance and replacement must be provided or qualified by our company.

1.5 Technology Specification

Rated Input Voltage	220V±10%
Rated Input Frequency	50/60HZ
Rated Output Power	550W/750W
Maximum Motor Rotation Speed	5000rpm/3500rpm

2. Upper Needle Stop Position Setting And Adjustment

IMPORTANT

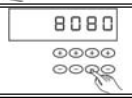
The needle stop position must be setted before the first operation, or the machine can't operate normally, and there will be needle broken and locked mechanical issues.

1

1..Press the key "S" on the same time turn on the Power key to enter function setup mode.

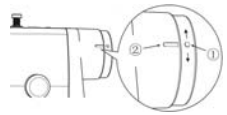
2. While entering into function setup mode, the operation panel LCD displays function code setting interface, then press key +/- to set the code.

2



Set the function code as：8080, which stands for the function code of upper needle stop position.

3



Manual rotates the hand wheel to adjust the needle to the required position.
Or alignment the needle position mark point on the hand wheel (POINT ①) and the mark point on the machine head (POINT ②)

This sewing machine needle position IS the factory standard needle position.

4

Then press the key "S" to save and actuate the function, four short tones are heard and it hints finishing the setting.

The needle position set in step 3 is just the upper needle position.

If the position and step(3) has a gap,you can enter the step (5) manual fine-tuning.

5

Through the "up"and "down" key to trim the position,the motor will be real time rotation, intuitive display whether the adjustment in place.

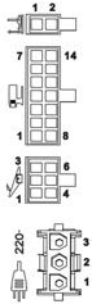
If the stop position be setted on the right position,the set function will be done.

3. Operation Description

3.1 Key Function Definition：

Function	Key	Description	Icon
Function ParameterEdit	P	Enter function parameter edit mode after pressing the key for 2~3S in the operation mode; Quit function parameter edit mode after press the key for 2~3S in the edit mode.	—
Setting Parameter Check And Save	S	After setting the function code, press this key to check the preset parameter and then can edit the parameter accordingly; When the parameter is fixed, press key to save the setting and quit.	—
Speed Increase/Decrease	▲	Increase the sewing speed	—
	▼	Slow down the sewing speed.	—
Parameter Increase/Decrease	+	Increase the parameter	—
	−	Decrease the parameter	—
Stitch Setting		Press this key to change the needle nubmer section.	—
Auto Function		Automatic function for constant stitch sewing.	
Needle Stop Position Selection		Select needle up/down stop position. The default is up position when the related icon is lighting on the panel LCD.	
Slow Launch Setting		Set slow launch function. When the related icon is display on the panel, the function is activated.	
Auto Lift Presser Foot After Pause		Set presser foot Auto-Lifting after pause function. When the related icon is display on the panel, the function is activated.	
Auto Lift Presser Foot After Trimming		Set presser foot auto-lifting after trimming function. When the related icon is display on the panel, the function is activated.	
Consecutive Reverse sewing		Set consecutive reverse sewing function. When the related icon is display on the panel, the function is activated.	
Free Sewing		Set free sewing function. When the related icon is display on the panel, the function is activated.	
Start Back-Tracking Sewing		Set start back-tracking sewing function. Continuous press the key,the function will in single back-tracking and dual back-tracking between the switch.	
End Back-Tracking Sewing		Set end back-tracking sewing function. Continuous press the key,the function will in single back-tracking and dual back-tracking between the switch.	
Constant Stitch Sewing		Execute section E constant stitch sewing. Continuous press the key,the function will in four section sewing, and user-defined multi-section between the switch.	
Line Trimming		When this function is selected, and this icon will be displayed on the panel LCD,and so line trimming function is activated.	
Lift And Fill Up Needle		Actuate lift and fill up needle function.	—
ClampThread Function		Set the clamp thread function.	

4. System Wire Diagram



Presser foot lift		
	1	P+32V
	2	Presser foot lifting magnet

Pedal		
	1	+5V
	2	Digital GND
	3	-
	4	Start signal
	5	Trimming signal
	6	Speed signal

Power		
	1	AC220
	2	AC220
	3	GND

Integrated machine-Magnet

Magnet		
	1	+32V
	8	Lines trimming magnet
	2	+32V
	9	Clamp thread /Lines picking magnet
	3	32V digital GND
	10	Fill needle switch
	4	LED 5V GND
	11	LED +5V
	5	32V digital GND
	12	Reverse stitching switch
	6	P+32V
	13	Reverse stitching magnet
	7	P+32V
	14	Lines loosing magnet

External machine-Magnet

Magnet		
	1	+32V
	8	Lines trimming magnet
	2	+32V
	9	Clamp thread /Lines picking magnet
	3	32V digital GND
	10	Fill needle switch
	4	LED +5V
	11	LED 5V GND
	5	32V digital GND
	12	Reverse stitching switch
	6	P+32V
	13	Reverse stitching magnet
	7	P+32V
	14	Lines loosing magnet

5. Operation Mode Selection

5.1 Sewing Mode

The machine enters into sewing mode as default setting after powering on. In the sewing mode, the user can select various kinds of sewing function after setting technology parameter.
In sewing mode, the users can switch over between various kinds of sewing function according to their need, but can't modify and set all the system technology parameters.

5.2 User Parameter Setting Mode

In user parameter setting mode, users can adjust various kinds of sewing function parameter. The steps are as follows：

1. Press key P for 2~3S in the sewing mode to enter into user parameter setting mode.
2. The interface after entering into user parameter setting mode is function ID selection, press +/- to select the required number.
3. After fixing the function ID, press key S to check and modify the related parameter,press +/- to set the required parameter.
4. After fixing the parameter, press key S to save the setting and quit the interface.
5. Press key P for 2~3S to quit the user parameter setting mode and back to sewing mode.

5.3 System Parameter Setting Mode

In system parameter setting mode, it's available to adjust kinds of the parameter of the electromagnets and system setting. The system parameter ranges from Fn-40 ~Fn-79. Details parameter can be set according the following steps.The steps are as follows：

1. Long press key P, in the same time turn on the power switch from off to enter into system parameter setting mode.
   In this mode, both system parameter and user parameter can be modified.
2. The default interface after entering into system parameter setting mode is function ID selection, press +/- to select number.
3. After fixing the function ID, press key S to check and modify the related parameter,press +/- to set the required parameter.
4. After fixing the parameter, press key S to save the setting and quit the interface..
5. Press key P for 2~3S to quit the system parameter setting mode and back to sewing mode.

User parameter table:

No.	Items	Default	Range	Contents
Fn－01	Maximum sewing speed (r/min)	3600	100～5000	Maximum speed adjustments
Fn－02	Set accelerated curve (%)	120	10～150	Set the acceleration slope
Fn－03	Start Back-Tacking speed (r/min)	1800	150～2800	Set Start Back-Tacking speed
Fn－04	End Back-Tacking speed (r/min)	1800	150～2800	Set End Back-Tacking speed
Fn－05	Bar-Tacking speed (r/min)	1800	150～2800	Set Bar-Tacking speed
Fn－06	Slow start speed (r/min)	300	150～2800	Set slow start speed
Fn－07	Number of Stitches for slow start	2	0～99	Number of stitches setting for slow start
Fn－08	Automatic Constant-Stitch sewing speed (r/min)	3200	300～4500	Speed adjustment for automatic constant-stitch sewing
Fn－09	Automatic end Back-Tacking sewing	1	0～1	1：After last seam of constant stitch sewing, it will automatic execute the End Back-Tacking sewing function. When turned on, the Stitch-Correction is invalid. 0：Automatic End Back-Tacking will not execute after last seam, but can be done by pedal manually.
Fn－10	Back-Tacking mode selection	1	0～1	1：JUKI mode (Press TB switch will activate reverse solenoid when either machine is stopped or running). 0: BROTHER mode (Press TB switch will activate reverse solenoid only when machine is running).
Fn－11	Start Back-Tacking running mode selection	1	0～2	1：Automatically perform actions 0：Could be arbitrarily stop and start. 2：Accurate Mode
Fn－12	Ending mode of star Back-Tacking	1	0～1	1：Start Back-Tacking is completed automatically continued for next action. 0：After the number of stitches is completed, stop automatically.
Fn－13	Start Back-Tacking compensation--1	60	1～150	Compensation for A part of Start Back-Tacking
Fn－14	Start Back-Tacking compensation--2	60	1～150	Compensation for B Part of Start Back-Tacking
Fn－15	End Back-Tacking running Mode selection	1	0～2	1；Automatically perform actions 0：Could be arbitrarily stop and start. 2；Accurate Mode
Fn－16	End Back-Tacking compensation--1	60	1～150	Compensation for C part of end Back-Tacking.
Fn－17	End Back-Tacking compensation--2	60	1～150	Compensation for D part of end Back-Tacking.
Fn－18	Bar-Tacking running mode selection	1	0～2	1：Automatically perform actions. 0：Could be arbitrarily stop and start. 2：Accurate Mode
Fn－19	Bar-Tacking compensation--1	60	1～150	Compensation for A,C part of Bar-Tacking
Fn－20	Bar-Tacking compensation--2	60	1～150	Compensation for B,D part of Bar-Tacking
Fn－21	Needle stop position selection	1	0～1	Valid only when the operation panel is disconnected, 1(UP)/ 0（DOWN）
Fn－22	Slow start function selection	0	0～1	Valid only when the operation panel is disconnected, 1(ON)/ 0（OFF）
Fn－23	Automatic foot lift after rimming function selection	0	0～1	Valid only when the operation panel is disconnected, 1(ON)/ 0（OFF）
Fn－24	Automatic foot lift when pause	0	0～1	Valid only when the operation panel is disconnected, 1(ON)/ 0（OFF）
Fn－25	Automatic function selection	0	0～1	Valid only when the operation panel is disconnected, 1(ON)/ 0（OFF）
Fn－26	Wipe thread function / clamp thread function selection	3	0～3	0(OFF) / 1(Wipe Thread Function ON) / 2(Clamp Thread Function ON) / 3(Keyboard Control Clamp Thread)
Fn－27	Clamp thread start angle	180	1～300	Clamp start angle (Thread length control)
Fn－28	Clamp thread output intensity	80	20～100	Clamp thread output intensity
Fn－30	The remaining thread Length control	180	120～360	The remaining thread Length control
Fn－31	Scissors sensitivity	0	0～50	5 lines Pedal, 0; ALL / 1; HALF / 2; Three combinations Pedal 3 lines Pedal：3-50 Sensitive

Fn－32	Accurate Mode spacing angle	100	0～180	The Bigger of the number,the more agily
Fn－35	Foot lifter fall time	0	0～1000	The longer the foot life drop more slowly
Fn－38	EEPROM selection	2	0～2	0(Internal EEPROM) / 1(Stop position and Bar-Tacking in external EEPROM) / 2(Stop position in External EEPROM)
Fn－39	Finished sewing piece counter	—	0～9999	Display the quantity of finished sewing piece

System parameter table

No.	Items	Default	Range	Contents
Fn－40	Direction of Motor Rotation	—	—	Reserved
Fn－41	Motor Brake Function	0	0～1	1：When motor stopped, Keep it locked / 0：No effect
Fn－42	Auto running for test function	0	0～1	1：enable / 0：disable When the parameter set as 1,the machine will start auto running as sewing function set on the operation panel.
Fn－43	Motor auto-running full time(hr.)	8	1～800	Only valid when Fn-42=1,set the full time for motor auto-running
Fn－44	Motor auto-running on cycle time(s)	3	1～30	Only valid when Fn-42=1, set the motor on time for each running cycle.
Fn－45	Motor auto-running off cycle times(s)	3	1～60	Only valid when Fn-42=1, set the motor off time for each running cycle.
Fn－46	The minimum speed(r/min)	300	100～400	Adjust the minimum speed of the motor
Fn－47	Thread trimming speed(r/min)	300	100～400	Speed is too low may lead to unusual thread, the speed is too high may lead to unstable positioning control
Fn－48	Foot lifter and back-tracking electromagnet operation time to full output (ms)	300	0～990	Foot lifter and back-tracking electromagnet operation time to full output
Fn－49	Back-tracking electromagnet operation duty cycle (%)	30	10～90	Back-tracking electromagnet operate in duty cycle to save the electricity and protect the electromagnet from over-heat.
Fn－50	Motor starting delay time (ms)	50	0～990	Delay the start time, with automatic presser foot down
Fn－51	Half step release foot lift	3	0～4	0：(OFF)/1：(Half step trigger)/2：(Half step keep) 3：(Half step follow)/4：(Disable Half step foot lift)
Fn－52	Safety switch signal selection	0	0～1	1：Keep ON / 0：Keep OFF
Fn－53	Trimming operation delay before the mechanical angle (Degrees)	189	120～250	The degrees between UP position and thread trimming action
Fn－54	Completion of the mechanical angle of the thread trimming action required (Degrees)	360	250～360	Completion of the mechanical angle of the thread trimming action required
Fn－55	Thread take action before the delay time n (ms)	10	0～980	The time between UP position and Thread take action
Fn－56	Thread take action time (ms)	70	0～9990	Completion of the thread take-up action required time
Fn－57	The time before foot lifter action (ms)	50	0～990	The time between thread take action and Foot lifter action
Fn－58	The time of foot lifter action maintain (s)	3	1～120	The time of foot lifter action maintain
Fn－59	UP needle position adjustment (Degrees)	15	1～30	UP needle position adjustment (15 is the central location)
Fn－60	Down needle position adjustment (Degrees)	180	140～220	Down needle position adjustment
Fn－61	Power on and positioning	1	0～1	1:ON / 0:OFF
Fn－62	The rate of normal stop (‰)	925	1～1999	Set the rate of normal stop
Fn－63	The rate of thread trimming stop (‰)	925	1～1999	Set the rate of thread trimming stop
Fn－64	Hold time of Back-Tacking (s)	30	1～120	Forced shut-down after hold time.
Fn－65	Low-speed maximum output torque (%)	30	10～80	Low-speed maximum output torque
Fn－66	Low-speed start-up time Selection (UP position enable)	0	0～5	The higher the gear, and start to accelerate the faster 0:OFF
Fn－67	Foot lifter electromagnet operation duty cycle (%)	30	10～90	Foot lifter electromagnet operate in duty cycle to save the electricity and protect the electromagnet from over-heat.

Fn－68	Sewing machine maintenance cycle (hr.)	0	0～9999	Set the sewing machine maintenance cycle time. Input [0], turn off the maintenance prompt function.
Fn－69	Direct drive UP position deviation angle (degrees x10)	—	0～3600	Direct drive UP position deviation angle (Relative to [Z] signal)
Fn－70	System fault information code	—	—	—
Fn－71	Encoder pulse number	—	0～1599	Display encoder pulse number.
Fn－72	Mechanical angle information	—	0～359	Display mechanical angle.
Fn－73	Output current for electromagnet(A) (A)	—	0.0～9.9	Display output current for electromagnet
Fn－74	The pedals speed level（V）	—	0.0～3.3	Display the pedals speed level
Fn－75	Input monitoring of the servo system (IO)	—	—	See note ①
Fn－78	Total running time of the sewing machine during the maintenance cycle (hr.)	—	0～9999	Display the total running time of the sewing machine during the maintenance cycle. Input [0], you can clear the total running time.
Fn－79	Reset to factory initial parameter	—	—	See Section 6.1

Note ① Description of the contents of Fn-75 parameter monitoring

Different spots-light represents a different meaning, the following table shown below:

[01]	Pedal Forward signal input
[02]	Pedal backward signal input
[03]	Back-Tacking control switch input
[04]	The safety control switch input
[05]	(SYNUP) UP position input
[06]	(SYNDN) down position input
[07]	(Hall) (U) signal
[08]	(Hall) (v) signal
[09]	(Hall) (w) signal
[10]	Bus voltage is too high signal
[12]	Encoder (Z) signal

6. Auxiliary Function

6.1 Factory Parameter Initialization

1.Refer to clause5.3 to enter system parameter setting mode.
2.Set function ID to Fn-79, Press key S to view and edit parameter.
3.Set different code to execute factory parameter initialization in different way. Details refer to the right table.Press key S to activate the initialization.

Initialization code and way
Input (1111)：Initialize the parameters from default parameter region.
Input(5555)：The keyboard to restore the default parameter.

6.2 The Number Of Processing Statistics

Under sewing mode，press S key，The display will show the processing statistics for the number.

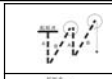
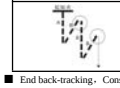
6.3 Real-time Motor Speed Monitor

Under user parameter setting mode or system parameter setting mode, press the accelerate adjustment key ▲, the display will show the real-time speed of motor.

6.4 Stitch Tracking Remedial Measure

The following description is based on A=4,B=4 for dual start back-tracking sewing remediation

Issue description	Remedial measure
	Root cause: The stitch number of section A is beyond the set value, or the length of section A last stitch is increased, the length of section B first stitch is decreased, which cause the final stitch of B can't overlap with the initial stitch of section A. Measure: Turn up the parameter of Fn-13 properly.
	Root cause: The stitch number of section A is less than the set value, or the length of the section A last stitch is decreased, the length of section B first stitch increased, which cause the final stitch of section B is over the initial stitch of section A. Measure: Turn down the parameter of Fn-13 properly.

	Root cause: The stitch number of section B is beyond the set value, or the length of the section B last stitch is increased, the length of following section first stitch decreased, which cause the final stitch of section B is over the initial stitch of section A. Measure: Turn up the parameter of Fn-14 properly.
	Root cause: The stitch number of section B is less than the set value, or the length of the section B last stitch is decreased, the length of following section first stitch increased, which cause the final stitch of section B can't overlap with the initial stitch of section A. Measure: Turn down the parameter of Fn-14 properly.

- End back-tracking，Consecutive back-tracking adjustment following the same way.
- End back-tracking parameter：Fn-16，Fn-17。Consecutive back-tracking parameter：Fn-19，Fn-20。

7. Troubleshooting And Maintenance

When there is error in the system, the error information will be shown on the panel, in the same time, the indicator led will light red. The user can handle the error by the error code according the manual.If the error can't be settled, please contact our technician for support.Error code will be indicated in HEX on the panel.
Refer to the following picture for Err-1 display：

Error code	Problem description	Measure
Err-0	Input signal self test error (power on pedal fault detect)	1. Check the connectivity of pedal signal. 2. Release the pedal to neutral position.
Err-1	Stop position signal error	UP-Stop position signal error.
Err-2	EEPROM read/write data error	Check up external the card reader
Err-3	EEPROM built-in parameter error	Power-on reset
Err-4	Over-current, over-voltage, over-heat, low-voltage	1. Turn off the machine for at least 30S, and then restart. 2. There maybe some malfunction for the motor power control module. 3. Check whether there are transient interference.
Err-5	Detect high voltage on the DC busbar	1. Turn off the machine for at least 30S, and then restart. 2. Check the power supply voltage.
Err-6	Detect over current for the power supply for electromagnet	1. Turn off the machine for at least 30S, and then restart. 2. Turn off the machine, and check the connectivity of the electromagnet circuit.
Err-7	Stalling	Turn off the machine and check the mechanical parts
Err-8	Motor decoder output signal error	Check the motor output signal line whether there is broken or poor contact.
Err-9	Synchronizer self test error	1.Turn off the machine, and check the connectivity of synchronizer. 2.Replace synchronizer
Err-E	Machine(head) maintenance prompt	The operation time reaches the maintenance period, Please do maintenance for the head, and then enter FN-78 to reset the accumulated operation time.
Err-F	Safety switch alarming	1. Check whether the head of the machine is turned over. 2. Check the connectivity of the circuit of safety switch.