

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】。
■ 阅读后，请务必仔细阅读。

以下列出在使用操作工业缝纫机伺服系统需要注意以及禁止的各个方面问题，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. 请将本设备置于温度低于50°C或高于40°C的环境内使用。
4. 请将本设备置于相对湿度低于30%或高于80%的环境内使用。
5. 请不要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。

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. 当需要更换线头、旋转轴头、插座连接插头时，必须断开电源。
3. 电线的接线必须通过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. 接通电源开关时请进行何脚操作。
3. 在正式运行之前，请务必确认所设定参数、开关是否正常运作。
4. 当缝纫机在运行过程中请勿触碰飞轮、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，再重新进行报警设置，重新进行运行。
6. 不定期拆开或关闭本设备电源。

1.4 关于保养

1. 控制箱内有高压电：开启控制箱盖必须断电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。

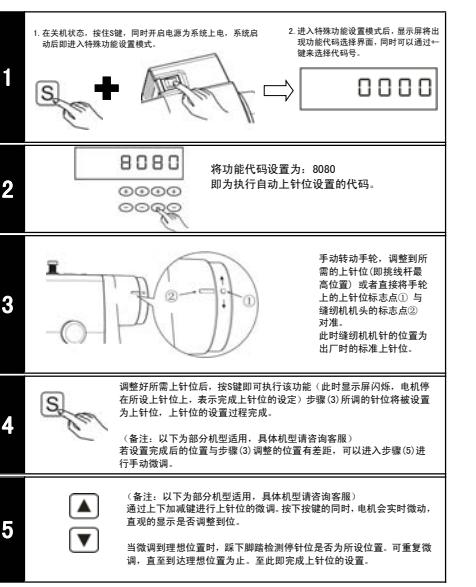
1.5 技术规格

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

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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、机械卡死等情况。



3. 操作说明

3.1 键盘显示功能对照表：

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；在缝纫模式状态下键2~3秒进入参数编辑状态，在参数编辑状态下键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，修改参数后按此键退出并保存参数	—
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	O	(只在最长缝有效) 当触发功能键激活时，显示屏显示图标，触发脚踏，手动走针的缝纫过程	—
停针位置选择键	W	选择停针时的上下针停针，默认状态为上针停针。当显示屏显示图标时表示选择上针停针	—
慢速启动设置键	L	慢速启动设置，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键	H	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	—
剪线后自动抬压脚设置键	J	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	—
连续回缝设置键	M	连续回缝功能设置，当显示屏显示图标时，激活连续回缝(W缝)功能	—
自由缝设置键	I	自由缝功能设置，当显示屏显示图标时，激活自由缝功能	—
起始回缝设置键	K	起始回缝功能设置，按一次激活起始回缝，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之间切换	—
终止回缝设置键	N	终止回缝功能设置，按一次激活终止单缝，按两次激活终止双缝。连续按键，将在终止单回缝和终止双回缝之间切换	—
定长缝设置键	F	执行定长缝，当显示屏显示图标时，激活定长缝功能，连续按键，将循环切换四段，选定多段模式。显示屏显示相应图标	—
剪线开关	X	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	Z	执行补针，提针功能，详见功能说明	—
夹线器开关	V	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



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。在此模式下，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。在此模式下，用户可依据需要切换各种缝纫功能的技术参数，参数设定步骤如下：

- 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，同时也对用户参数进行修改。
- 通过“一键来选择参数号”按下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”。
- 选择好参数号后按下键进入参数修改界面进行参数值查看和修改。
- 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。
- 按P键2秒退出系统参数设置模式，返回一般缝纫模式。

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电磁铁参数以及系统设置，参数设定步骤如下：

- 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，同时也对用户参数进行修改。
- 通过“一键来选择参数号”按下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”。
- 选择好参数号后按S键保存参数值并退出至参数号选择界面。
- 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。
- 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：

- 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，同时也对用户参数进行修改。
- 通过“一键来选择参数号”按下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”。
- 选择好参数号后按S键保存参数值并退出至参数号选择界面。
- 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。
- 按P键2秒退出系统参数设置模式，返回一般缝纫模式。

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用户参数表 V1.4			
参数号	名称	出厂值	范围
Fn-01	最高转速(r/min)	3600	100~5000
Fn-02	加速曲线调整(%)	80	10~150
Fn-03	起始回缝速度(r/min)	1800	150~2800
Fn-04	停止回缝速度(r/min)	1800	150~2800
Fn-05	连续回缝速度(r/min)	1800	150~2800
Fn-06	慢速启动速度(r/min)	300	150~2800
Fn-07	慢速启动倍率(%)	2	0~99
Fn-08	定长缝启动运行速度(r/min)	3200	300~4500
Fn-09	定长缝后自动执行终止回缝功能	1	0~1
Fn-10	点动倒缝功能模式选择	1	0~1
Fn-11	起始回缝运行模式	1	0~2
Fn-12	起始回缝结束模式	1	0~1
Fn-13	起始回缝补偿1	60	1~150
Fn-14	起始回缝补偿2	60	1~150
Fn-15	终止回缝运行模式	1	0~2
Fn-16	终止回缝补偿1	60	1~150
Fn-17	终止回缝补偿2	60	1~150
Fn-18	连续回缝运行模式	1	0~2
Fn-19	连续回缝补偿1	60	1~150
Fn-20	连续回缝补偿2	60	1~150
Fn-21	仰针位选择	1	0~1
Fn-22	慢速启动速度设置	0	0~1
Fn-23	带线自动抬压脚设置	0	0~1
Fn-24	中途停车自动抬压脚设置	0	0~1
Fn-25	触发行程自动抬压脚设置	0	0~1
Fn-26	自动抬压脚/线迹长度设置	3	0~3
Fn-27	无线迹自动抬压脚设置	180	1~300
Fn-28	夹线杆线圈驱动输出力度(%)	80	20~100
Fn-29	剪线余线长度控制	180	120~360
Fn-30	线迹长度控制	—	—
Fn-31	脚踏板剪刀灵敏度	0	0~50
Fn-32	精准加固缝锁敏捷度	100	0~180
Fn-33	抬压脚软下时间	0	0~1000
Fn-34	存储器(EPPROM)选择	0	0~2
Fn-35	车缝完成件显示	—	0~9999

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不同机型默认参数有差异，请根据恢复出厂设置为标准

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7. 故障处理与维护

当系统出现错误时，请将信息显示框显示于显示屏上，用户可根据错误代码进行简单的故障排除。如果出现用户无法解决的故障时，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	代码含义	解决方法
Err-0	脚踏输入信号检测错误(+/-脚踏脚故障检测)	1. 检查脚踏板的信号是否连接正常 2. 松开脚踏板，重新拉伸脚踏板
Err-1	定位信号异常(常开)	1. 定位信号常开信号(手轮上的磁钢)异常
Err-2	EPPROM读写数据错误	检查读卡器是否读好
Err-3	EPPROM内设置参数错误	1. 电源重启 2. 清除EPPROM数据
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
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. 检查电源电压是否正常
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. 检查电源线是否接触不良
Err-7	堵转	关机系统，检查缝纫机机架结构是否正常
Err-8	电机编码器输出信号错误	检查电机编码器输出信号是否断线或者连接不良
Err-9	同步器自检错误	1. 关机系统，重新连接同步器 2. 更换同步器
Err-E	缝纫机(机头)保养提示	缝纫机运行时间到达所设置的保养周期，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. 机头断开开关 2. 检查安全开关回路是否连接正常

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-14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

不同机型默认参数有差异，请根据恢复出厂设置为标准

不同机型默认参数有差异，请根据恢复出厂设置为标准

一体机控-电磁铁接线

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°C or above 45°C.
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

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

1.3 Operation

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

1.4 Maintenance

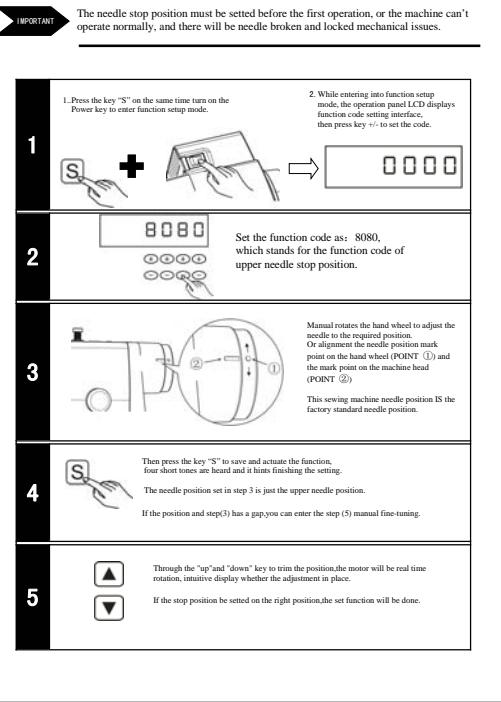
- As there are high voltage in the control cabinet, avoid to open the cabinet within 5 minutes after turning off..
- Only the trained expert is allowed to maintain and repair the machine.
- All the components for maintenance and replacement must be provided or qualified by our company.

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

1

2. Upper Needle Stop Position Setting And Adjustment



2

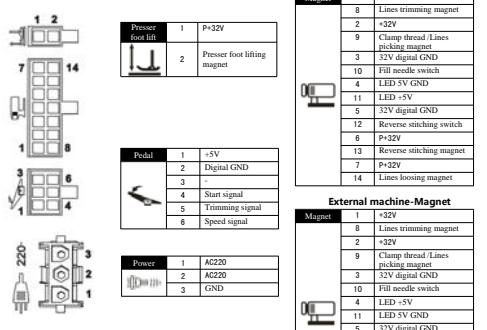
3. Operation Description

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 number 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.	○
Line Trimming	○	When this function is selected, and this icon will be displayed on the panel LCD,so line trimming function is activated.	○
Lift And Fill Up Needle	○	Actuate lift and fill up needle function.	—
Clamp Thread Function	○	Set the clamp thread function.	○

3

4. System Wire Diagram



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 user 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:

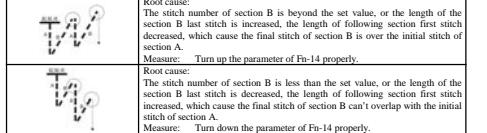
- Press key P for 2~3S in the sewing mode to enter into user parameter setting mode.
- The interface after entering into user parameter setting mode is function ID selection, press +/- to select the required number.
- After fixing the function ID, press key S to check and modify the related parameter,press +/- to set the required parameter.
- After fixing the parameter, press key S to save the setting and quit the interface.
- 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 parameter of the electromagnets and system setting. The system parameter setting mode from Fn-40 ~79. Details parameter can be set according the following steps. The steps are as follows:

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

4



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 on the HX 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 electromagnets	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	1. Turn off the machine, and check the connectivity of the motor output signal. 2. Replace synchronizer
Err-9	Synchronizer self test error	The operation time reaches the maintenance period. Please do maintenance for the head, and then enter FN-78 to fix the error for the synchronization timing.
Err-E	Machine(head) maintenance prompt	
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.

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6. Auxiliary Function

6.1 Factory Parameter Initialization

1.Refer to clause 5.3 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.

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
Power on and positioning	1 0~1 1:ON / 0:OFF
The rate of normal stop (%)	925 1~1999 Set the rate of normal stop
The rate of thread trimming stop (%)	925 1~1999 Set the rate of thread trimming stop
Hold time of Back-Tacking (s)	30 1~120 Forced shut-down after hold time
Low-speed maximum output torque (%)	30 10~80 Low-speed maximum output torque
Low-speed start-up time Selection	0 0~5 The higher the gear, and start to accelerate the faster
Foot lifter deceleration	3 lines Pedal, 0, ALL, 1, HALF, 2, Three combinations 3 lines Pedal : 3.50 Sensitive
Foot lifter deceleration operation duty cycle (%)	30 10~90 Foot lifter deceleration in duty cycle to save the electricity and protect the electromagnet from overheat.

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