

前言

注意：使用前请详细阅读本用户手册及所搭配的缝制设备说明书，配合正确使用，并须由接受过专业培训的人员来安装或操作。

本产品仅适用于指定范围的缝制设备，请勿移做其他用途。

本公司拥有对此用户手册的最终解释权。

使用中若存有任何疑问或对我们的产品及服务有任何意见或建议，请随时与我们联系。

安全说明

- 1) 安装和调试前，请仔细阅读认真地阅读本手册。
- 2) 本手册中标有⚠符号之处为安全注意点，必须特别注意并严格遵守，以免造成不必要的损害。
- 3) 本产品须由受过专业培训的人员来安装或操作。
- 4) 确保电源安全接地并符合产品铭牌上标示的电压范围及技术要求。
- 5) 接通电源开关时，请把脚离开脚踏板。

- 6) ⚠在进行以下操作时，必须先断开系统电源：
 - 安装机器时；
 - 在控制器上插拔任何连接插头时；
 - 穿针线，换机针及翻抬机头时；
 - 控制器停用及修理或调整时。
- 7) 拧紧所有紧固件，以防止缝制作业时产生振动或停针位置错位等异常现象。
- 8) 每次关闭控制系统后再次启动，应相隔 30 秒以上。
- 9) 设置系统控制参数或进行保养修理工作应由受过相关培训的专业人员来完成。
- 10) 维修所用的所有零部件，必须由本公司提供或认可，方能使用。
- 11) 接地线的安装（特别注意）。

注意：安装控制器时必须正确接地，否则将导致控制器无法正常工作，更严重的可能会被电击（详见安装章节）。

1. 产品介绍

1.1 概述

此系列工业缝纫机数控交流伺服系统，电机与控制器分体吊装，使配置组合灵活方便，电机与控制器可按需搭配，实现多种缝纫机对功率、速度等的配套要求；安装简易、调整便捷、力矩大、体积小、噪音低、效率高（省电！）；采用开关电源供电，使其具有更宽的电压适配范围；电磁铁侧面接插，使连接更可靠，避免油污污染引起的控制器故障；优化交流伺服电机控制策略，使转速控制精度高，停针速度快；专利设计的吊装方式使安装更简捷，整体震动降至最低，系统运行更平稳；具有电磁铁回路短路保护功能，防止错误接线损坏控制器。

4. 控制器接口定义

控制器与电机同步传感器组件、操作面板和电源线等的连接如图 4-1 所示，将各个连线的插头插入控制器上对应的插座即可。装好后，检查一下插头是否插牢。

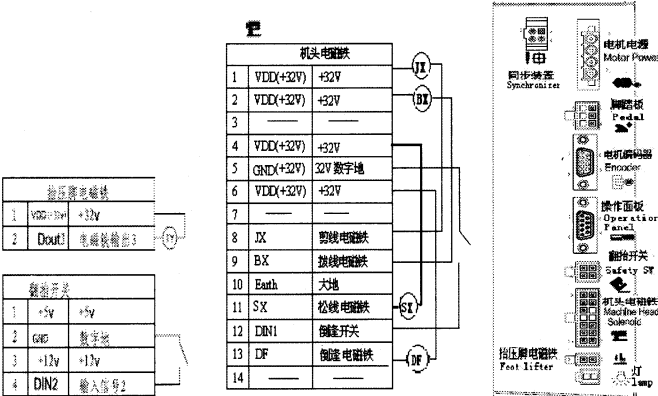


图 4-1 控制器对外接口示意图

*注：机头 LED 灯接口的驱动能力：

额定电流为 100mA，额定电压为 5V。

推荐的 LED 发光二极管参数：

VF: Min. = 3.0V, Max. = 3.6V (test condition IF = 20mA)；

Peak Forward Current: Max. = 80mA；

Continuous Forward Current : Max. = 35mA

注意：使用正常的力量插不进去时，请检查插头与插座是否匹配，插入方向或针的方向是否正确。

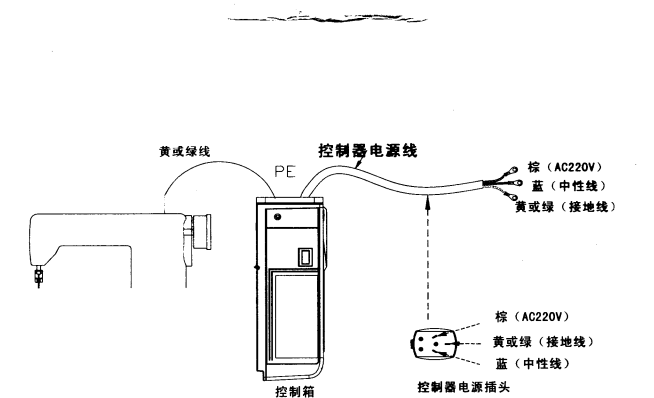


图 3-1

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！

当电源系统配置为三相四线式 / 三相五线式 380V 时，欲使用单相 220V 供应本电机的接线方式如图 3-2 所示：

注意：如果此配置系统没有 [中性 (点) 线] 时，本控制系统不适合在此场所使用。

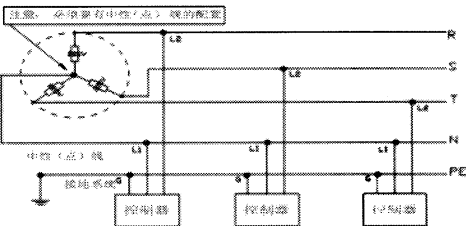


图 3-2

1.2 基本参数

JK2000A 系列数控交流伺服系统的基本参数详见表 1。

表 1:

控制器型号	JK2000A1	JK2000A2
电机最大转速 (r/min)	5000	
电源电压	AC 220±20% V 50/60HZ	
输出功率	550W	
电机低速最大转矩	3Nm	
工作环境	0℃ ~ 40℃	
电机传动方式	下挂皮带电机驱动	直驱驱动

2.2 JK2000A2 直驱控制器的安装

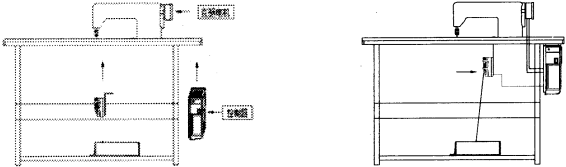


图 2-3 JK2000A2 直驱控制器安装示意图

2.3 控制器外形尺寸

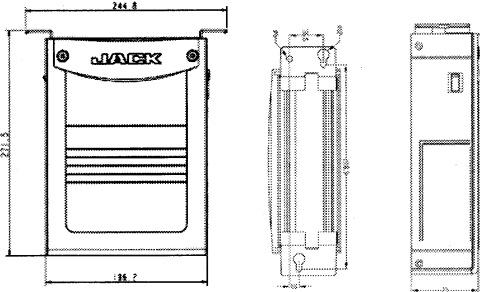


图 2-4 JK2000A 控制器尺寸图

3.接线与接地

控制系统上电及投入使用前,必须确保 AC 输入端已安全可靠的接地(如图 3-1 所示)。系统的接地线为黄绿线,该地线请务必可靠连接至机头上(如连接到机头的螺丝上),以保证安全使用,并可防止出现异常情况。

2.安装图

2.1 JK2000A1 下挂皮带电机的安装

第一步:安装吊装螺栓,若缝纫机台板上无预留定位孔时需按图 2-1 所示尺寸钻孔,置入定位吊装螺栓。

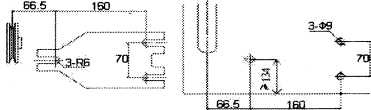


图 2-1 螺栓钻孔尺寸图

第二步:安装电机(见图 2-2)。将电机吊上吊装螺栓后紧固。

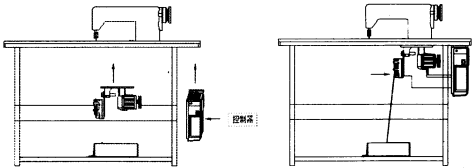


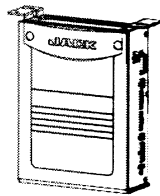
图 2-2 JK2000A1 电机安装示意图

5.故障处理及维护

故障代码	代码含义	解决措施
01	硬件过流	关闭系统电源, 30 秒后重新接通电源, 控制器若仍不能正常工作, 请更换控制器并通知厂方。
02	软件过流	关闭系统电源, 30 秒后重新接通电源, 控制器若仍不能正常工作, 请更换控制器并通知厂方。
03	系统欠压	断开控制器电源, 检查输入电源电压是否偏低(低于 176V)。若电源电压偏低, 请在电压恢复正常后重新启动控制器。若电压恢复正常后, 启动控制器仍不能正常工作, 请更换控制器并通知厂方。
04	停机时过压	断开控制器电源, 检查输入电源电压是否偏高(高于 264V)。若电源电压偏高, 请在电压恢复正常后重新启动控制器。若电压恢复正常后, 启动控制器仍不能正常工作, 请更换控制器并通知厂方。
05	运行时过压	关闭系统电源, 检查电磁铁连线是否正确, 是否有松动、破损等现象。若有则及时更换。确认无误后重启系统, 若仍不能工作, 可寻求技术支援。
06	电磁铁回路故障	关闭系统电源, 30 秒后重新接通电源观察是否能正常工作。不行的话重试几次, 若该故障频繁出现, 需请求技术支援。
07	电流检测回路故障	断开控制器电源, 检查电机电源输入插头是否脱落、松动、破损, 是否有异物缠绕在机头上。排除后重启系统仍不能正常工作, 请更换控制器并通知厂方。
08	电机堵转	关闭系统电源, 检查电源板上白色的制动电阻接头是否松动或脱落, 将其插紧后重启系统。若仍不能正常工作, 请更换控制器并通知厂方。
09	制动回路故障	检查控制面板与控制器的连线是否脱落、松动、断裂, 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。
10	HMI 通讯故障	检查机头同步信号装置与控制器的连线是否松动, 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。
11	机头停针信号故障	请断电后再尝试 2~3 次, 若仍报故障, 请更换控制器并通知厂方。
12	电机初始角度检测故障	

13	电机 HALL 故障	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。
14	DSP 读写 EEPROM 故障	请断电后再尝试 1 次, 若仍报故障, 请更换控制器并通知厂方。
15	电机超速保护	关闭系统电源, 30 秒后重新接通电源观察是否能正常工作。不行的话重试几次, 若该故障频繁出现, 请更换控制器并通知厂方。
16	电机反转	关闭系统电源, 30 秒后重启系统, 若仍不能正常工作, 请更换控制器并通知厂方。
17	HMI51 读写 EEPROM 故障	关闭系统电源, 30 秒后重启系统, 若仍不能正常工作, 请更换控制器并通知厂方。
18	电机过载	关闭系统电源, 30 秒后重启系统, 若仍不能正常工作, 请更换控制器并通知厂方。
19	少油报警	给针杆部分加油, 并将 P22 参数设置为 4000, 将上次加油后工作时间复位; 也可以按 P 键关闭报警, 继续使用。

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Preface



CAUTION:

Please read this manual carefully, also with related manual for the machinery before use the controller. For installing and operating the controller properly and safely, qualified personnel are required.

This product is designed for specified sewing machines and must not be used for other purposes.

If you have any problem or any comment, please feel free to contact us.

Safety Instruction

- 1) All the instruction marked with sign must be absolutely observed or executed; otherwise, personal injuries or risk to the machine might occur.
- 2) This product should be installed and operated by persons with appropriate training only.
- 3) Before connecting power supply cords to power sources, it's necessary to make sure that the power voltage is in the range indicated on the product name plate.
- 4) Make sure to move your feet away from the pedals while power on.
- 5) Turn off the power and remove plug prior to the following operations:
 - Connecting or disconnecting any connectors on the control box;

Page 1 of 8

- Repairing or doing any mechanical adjustment;
- Threading needle or raising the machine arm;
- Machine is out of work.

- 6) Make sure to fasten all the fasteners firmly in the control boxes prior to the operation of the system.
- 7) Allow an interval of at least 30 seconds before repapering the system after power off.
- 8) Repairs and maintenance work may be carried out by special trained electronic technicians.
- 9) All the replacement parts for repairing must be provided or approved by the manufacturer.
- 10) The controller must be firmly connected to a properly grounded outlet.



CAUTION:

Be sure to connect the controller to a properly grounded outlet. If the grounding connection is not secured, you may run a high risk of receiving a serious electric shock, and the controller may operate abnormally.

1. Product Introduction

1.1 Overview

These Series Digital AC Servo System, the motor and the controller are separately mounted on the same bracket, providing a very flexible mounting solution for customers. The system can be easily configured with different motors to match with various sewing machines, such as lockstitch, dual-needle lockstitch, heavy duty, and direct-driven sewing machines. The solenoid outputs are over current protected, preventing damage of the controller in case of mis-wiring of external accessories. Employing a switch-mode power supply for the sensitive control circuitry, the system can operate over a much wider voltage range. Side-mount connectors make the connection more reliable and reduce the malfunction caused by oil leakage.

1.2 Basic parameters

Basic parameters of Jk2000A series Digital AC Servo System (see table 1).

Table 1:

Page 2 of 8

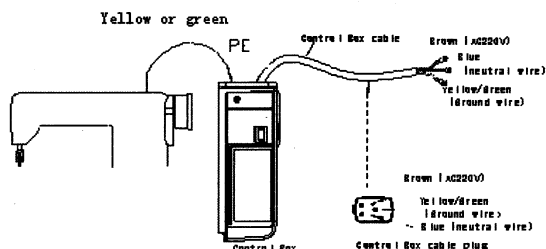


Fig. 3-1



CAUTION

Ensure all power cord, signal wire and grounding wire not be pressed by other matter or over-twisted, and not be too close to belt and belt wheel, keep 3cm-distance for safety.

A 1Φ/220V power from a 3Φ/380V Power source Connection (See Fig.3-2):



CAUTION

If the system have no Neutral point, then this servo motor is not suitable for this connection.

Caution: Must have a Neutral point

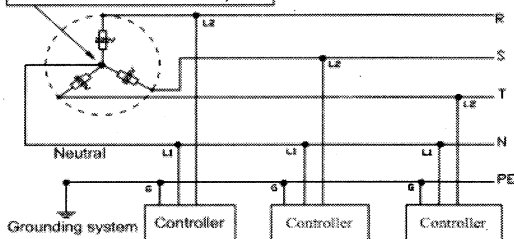


Fig. 3-2

Page 5 of 8

4. Definition of controller interface

Connections between control box and other accessories are illustrated in Fig.4-1. Plug these connectors into the corresponding sockets in control box.

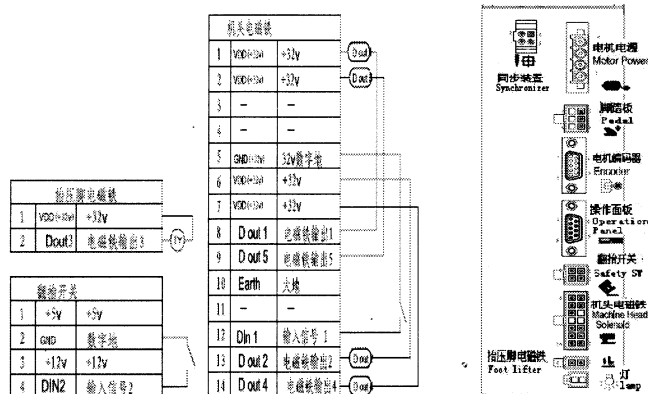


Fig. 4-1

★ The drive ability of the LED jack:

which the rated current is 20mA and the rated voltage is 3V.

Recommendatory LED diode parameter as follows:

VF: Min. = 3.0V, Max. = 3.6V (test condition IF = 20mA);

Peak Forward Current: Max. = 80mA;

Continuous Forward Current: Max. = 35mA



Caution:

Please check if all connectors match or not, pins are found right definition or not.

Page 6 of 8

Controller Type	JK2000A1	JK2000A2
Max. Sewing Speed (r/min)	5000	
Voltage Range	AC 220±20% V 50/60HZ	
Output Power	550W	
Max. Torque	3Nm	
Environment	0℃ ~ 40℃	
The motor way of transmission	Belt drive	Direct drive

2. Installation Instructions

2.1 Motor Installation

Step 1: Mount lifting bracket. When motor installed under the machine table, as needed, to drill holes in the following diagrams (see Fig. 2-1 the example for USA base table) for the installation, mount lifting bracket.

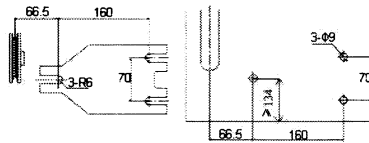


Fig.2-1

Step 2: Install the motor (see Fig.2-2) and then tighten the lifting bracket.

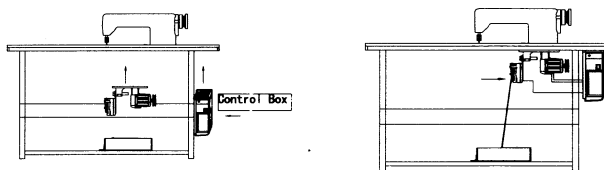


Fig.2-2

2.2 Controller Installation

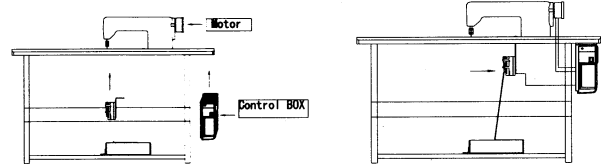


Fig.2-3

2.3 Controller shape dimension

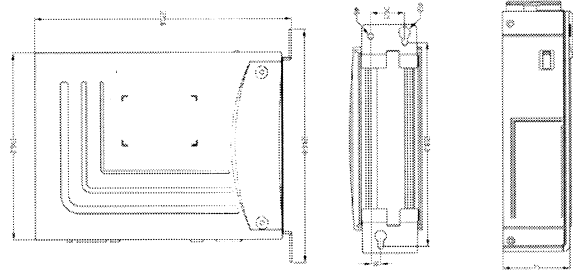


Fig.2-4

3. Power Connection and Grounding

Ground wire (Green/yellow) must be grounded. Use the correct connector and extension wire when connecting ground wire to Earth and secure it tightly (see Fig.3-1).

5. Recovery processing and maintenance

error code	meaning	solution
01	hardware overflow	Turn off the system power, restart after 30 seconds, if the controller still does not work, please replace it and inform the manufacturer.
02	software overflow	Turn off the system power, restart after 30 seconds, if the controller still does not work, please replace it and inform the manufacturer.
03	system under-voltage	Disconnect the controller power and check if the input voltage is too low (lower than 176V). If yes, please restart the controller when the normal voltage is resumed. If the controller still does not work when the voltage is at normal level, please replace the controller and inform the manufacturer.
04	over-voltage when the machine is off	Disconnect the controller power and check if the input voltage is too high (higher than 264V). If yes, please restart the controller when the normal voltage is resumed. If the controller still does not work when the voltage is at normal level, please replace the controller and inform the manufacturer.
05	over-voltage in operation	Disconnect the controller power and check if the input voltage is too high (higher than 264V). If yes, please restart the controller when the normal voltage is resumed. If the controller still does not work when the voltage is at normal level, please replace the controller and inform the manufacturer.
06	solenoid circuit failure	Turn off the system power, check if the solenoid is connected correctly and if it is loose or damaged. If yes, replace it in time. Restart the system upon making sure everything is in good order. If it still does not work, seek technical support.
07	electrical current checking circuit failure	Turn off the system power, restart after 30 seconds to see if it works well. If not, try several more times. If such failure happens frequently, seek technical support.
08	locked motor roller	Disconnect the controller power, check if the motor input plug is off, loose or damaged, or if there is something twined on the machine head. After checking and correction, if the system still does not work, please replace the controller and inform the manufacturer.
09	brake circuit failure	Turn off the system power, check if the white brake resistance plug on the power board is loose or dropped off, fasten it and restart the system. If it still does not work, please replace the controller and inform the manufacturer.
10	HMI communication failure	Check if the connecting line between control panel and controller is off, loose or broken, restore it and restart the system. If it still does not work, please replace the controller and inform the manufacturer.
11	machine head needle positioning failure	Check if the connection line between machine head synchronizer and controller is loose or not, restore it and restart the system. If it still does not work, please replace the controller and inform the manufacturer.
12	motor original angle checking failure	Please try 2 to 3 more times after power down, if it still does not work, please replace the controller and inform the manufacturer.

13	Motor HALL failure	Turn off the system power, check if the motor sensor plug is loose or dropped off, restore it and restart the system. If it still does not work, please replace the controller and inform the manufacturer.
14	DSP Read/Write EEPROM failure	Try another time after power down, if it still does not work, please replace the controller and inform the manufacturer.
15	Motor over-speed protection	Turn off the system power, turn on again in 30 seconds to see if it works. If not, try several more times, if such failure happens frequently, please change the controller and inform the manufacturer.
16	Motor reversion	Turn off the system power, restart the system after 30 seconds, if it still does not work, please replace the controller and inform the manufacturer.
17	HMI51 Read/Write EEPROM failure	Turn off the system power, restart the system after 30 seconds, if it still does not work, please replace the controller and inform the manufacturer.
18	Motor overload	Turn off the system power, restart the system after 30 seconds, if it still does not work, please replace the controller and inform the manufacturer.
19	Lack of oil alarm	Add oil to the needle rod, and set the P22 parameter at 4000, resume the working time after the last oil adding, or you can press button P to close the alarm and continue to use.

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2011-7-19

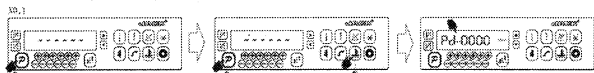
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HMI 操作参数表

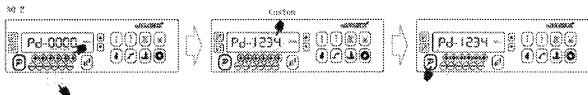
1. 参数传输方式

- 1) 下传参数 (自操作面板向控制器传参数) ;
- 2) 上传参数 (自控制器向操作面板传参数)。

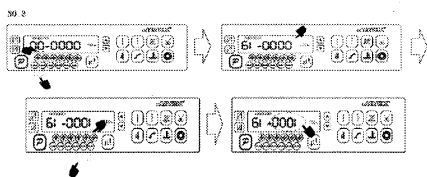
第一步: 在操作员模式下, 先按下 **P** 键不放, 再按 **1** 键, 液晶会显示 Pd-0000, 要求键入技术员设置的密码。



第二步: 使用后四个 **+** 键和 **-** 键输入密码, 然后按下 **P** 键。如果密码正确 (图中示例密码为 1234), 即进入技术员模式, 否则退回到操作员模式。



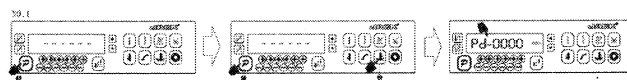
第三步: 使用第一个和第二个 **+** 键和 **-** 键来改变技术员参数索引至 **【61】**, 使用最后一个 **+** 键和 **-** 键更改恢复值, 选 “1” 为下传参数, 选 “2” 为上传参数。



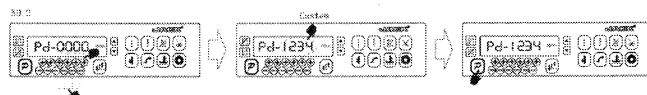
2. 恢复电控厂家出厂参数

第一步: 在操作员模式下, 先按下 **P** 键不放, 再按 **1** 键, 液晶会显示 Pd-0000, 要求键入技术员设置的密码。

第 1 页 共 4 页



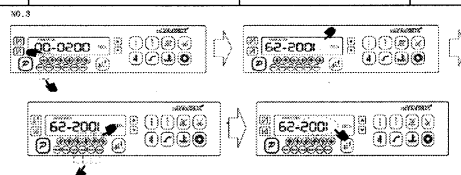
第二步: 使用后四个 **+** 键和 **-** 键输入密码, 然后按下 **P** 键。如果密码正确 (图中示例密码为 1234), 即进入技术员模式, 否则退回到操作员模式。



第三步: 使用第一个和第二个 **+** 键和 **-** 键来改变技术员参数索引至 **【62】**, 使用后

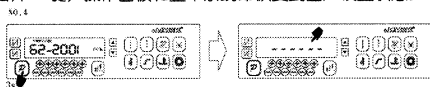
四个 **+** 键和 **-** 键更改成电控厂家提供的出厂参数恢复值:

厂家 (杰克)	型号	360 线参数恢复	180 线参数恢复
1	讯利 II	2001	9201
2	迅利 III	2003	9203
3	8995 针送料	2006	9206
4	双针直驱 (58450CD-005)	2007	9207
5	讯利 II-YUKI	2002	9202
6	迅利 III-YUKI	2004	9204
7	8995 针送料-YUKI	2005	9205
8	讯利 II-YUKI (厚料)	2008	9208
9	迅利 III-YUKI (厚料)	2009	9209
10	厚料机	5100	



第 2 页 共 4 页

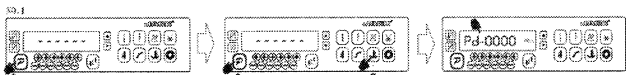
第四步: 确认参数输入无误后, 按住 **P** 键不动, 直至操作面板红灯常亮或蜂鸣器长响一声之后, 松开 **P** 键, 操作面板和整个系统即恢复至出厂设置状态。



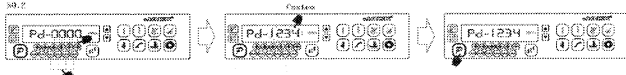
3. 恢复用户自定义出厂参数

使用操作面板参数 **【63】** 可将当前用户设置的个性化参数作为自定义参数, 操作方法如下:

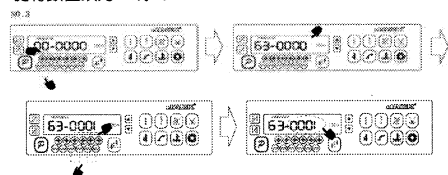
第一步: 在操作员模式下, 先按下 **P** 键不放, 再按 **1** 键, 液晶会显示 Pd-0000, 要求键入技术员设置的密码。



第二步: 使用后四个 **+** 键和 **-** 键输入密码, 然后按下 **P** 键。如果密码正确, 即进入技术员模式, 否则退回到操作员模式。



第三步: 使用第一个和第二个 **+** 键和 **-** 键来改变技术员参数索引至 **【63】** 使用最后一组 **+** 键和 **-** 键将数值改为 1 或 2。



注: 设置为 1 则后续恢复用户自定义出厂参数的时候使用的就是 1, 设置为 2 则后续恢复用户自定义出厂参数的时候使用的就是 2。

第四步: 按住 **P** 键 5 秒钟左右以后, 操作面板和整个系统即可将当前参数设置定义

第 3 页 共 4 页

为用户自定义恢复出厂参数。

当系统因参数设置导致控制系统出错时, 用户可以使用自定义的恢复出厂参数调整过来, 操作方法同 “恢复电控厂家出厂参数” 说明一样, 将系统员参数 **【62】** 更改为 1 或 2, 长按 **P** 键 5 秒钟以后, 系统会恢复至用户自定义的参数设置。

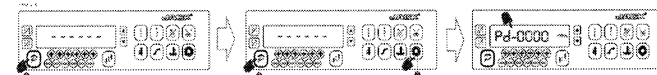
注意事项:

- 1、上电后操作面板仅下传操作员模式的参数, 不会主动上传技术员与系统员的参数。如果确定要上传一次全参数, 可以通过技术员参数 **【61】** 主动下传操作面板中的全部当前活动参数。
- 2、如果要恢复操作面板中保存的其他参数, 需通过技术员参数 **【62】** 激活为当前活动参数, 并主动上传。
- 3、单个参数修改完后, 操作面板确认该参数修改后的值与修改前不同时, 才上传该参数。
- 4、恢复出厂参数之后, 系统最好重新上电复位一次。

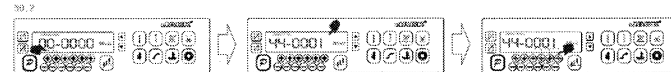
4. 抬压脚功能

带有抬压脚功能的机头产品时, 需要将抬压脚功能开启, 即修改系统员 P44 参数至 200 即可, 如下所示:

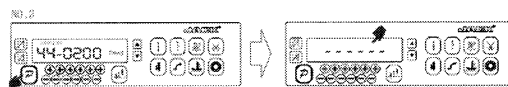
- 1) 按下 **P** 键不放, 再按 **1** 键: 通过键入正确密码进入系统员参数设置模式;



- 2) 将参数号调整到 44, 再将 44 号参数值调整到 200;



- 3) 按 **P** 键退出系统员参数设置模式。



386P0008B

2012-4-10

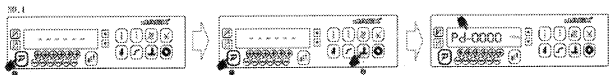
第 4 页 共 4 页

HMI PARAMETER TABLE

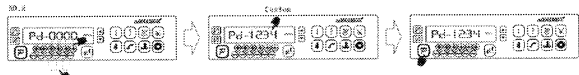
1. Translating Parameter

- Download parameters(the panel will parameter from panel to controller);
- Upload parameters (the panel will parameter from controller to panel).

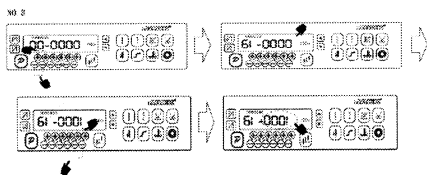
Step 1: Under operator mode, press and keys, LCD Pd-0000; user type the passport.



Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.

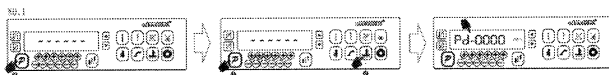


Step 3: Change the technician parameters index to【61】by the first and the second key and key under technician mode, then press key to set parameter. The value is changed 1or 2 by the last keys and keys. The 1 is download parameter; The 2 is upload parameter.



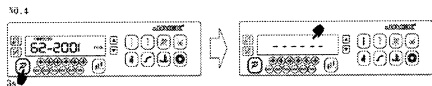
2. Restore storage parameter for factory of control

Step 1: Under operator mode, press and keys, LCD Pd-0000; user type the passport.



第 1 页 共 4 页

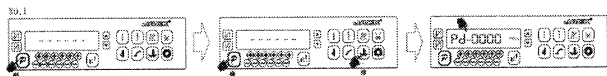
system restore storage parameter.



3. Restore default user's own parameter

The parameter 【63】 of HMI can be used to set the customer's own parameters, following methods of operation :

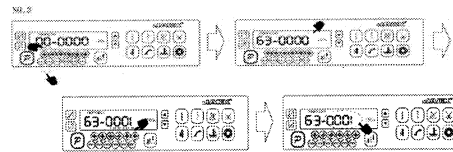
Step 1: Under operator mode, press and keys, LCD Pd-0000; you required to type the passport.



Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.



Step 3: Change the technician parameters index to 【63】 by the first and the second key and key under technician mode, then press key to set parameter. The value is changed 1or 2 by the last key and keys.



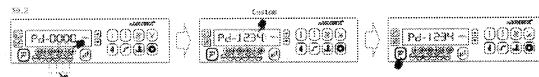
Note: when it set 1, the follow-up to the user to customize the parameter is used 1; when it set 2, the follow-up to the user to customize the parameter is used 2.

Step 4: Press key keep 5 second, HMI and the whole system will the current parameter set restor the user to customize storage parameter.

When the parameter cause to the control system error, the user can restore the

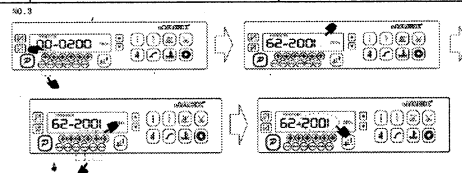
第 3 页 共 4 页

Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.



Step 3: Change the technician parameters index to 【62】 by the first and the second key and key under technician mode, then press key to set parameter. Restore storage parameter for factory of control can be changed by the last four keys and keys, Usually it's four bit.

Factory (Jack)	Model	360 Recovery Parameter	180 Recovery Parameter
1	Shirley II	2001	9201
2	Shirley III	2003	9203
3	8995 needle feed	2006	9206
4	Double needle direct drive (58450CD-005)	2007	9207
5	Shirley II-YUKI	2002	9202
6	Shirley III- YUKI	2004	9204
7	8995 needle feed- YUKI	2005	9205
8	Shirley II-YUKI Thick material	2008	9208
9	Shirley III- YUKI Thick material	2009	9209
10	Thick material machine (AS58)	5100	



Step 4: the parameter confirms correct, press key until the red light of HMI are bright or buzz produces a long loud, release key, HMI and the whole

第 2 页 共 4 页

custom of the parameters, the methods of operation as "4.1 Restore storage parameter for factory of control".The parameter 【62】 is changed 1or 2, Press key keep 5 second again, the system will restore the user to customize storage parameter.

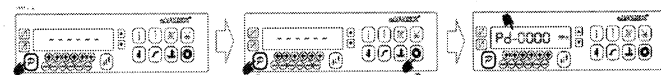
Note:

- After power on, HMI only download operator mode parameter, but not technician and administrator parameter. If all parameter is needed, technician parameter 61 can be used to download all current working parameter of HMI 50.
- If restore other parameter of HMI storage, technician 62 can be used to make it current working parameter, and download initiative.
- After single parameter modification, HMI will download the value that is different with old value of parameter.
- Recover default parameters, the system the best in the clear once again.

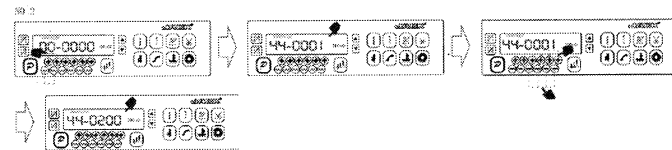
4. foot lifter function

with foot lifter function of head-machine products, it needs to be opened, which modify the system P44 parameter to 200 :

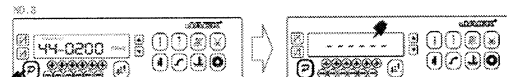
1) Press and keys, user type the correct passport to entry administrator mode ,LCD Pd-0000.



2) The first parameter is adjusted to 44, then 44 parameter is adjusted to 200;



3) Press key to exit administrator mode.



386P0008B

2012-4-10

第 4 页 共 4 页