

AH55 digital AC servo control systems
Products data manual (V1.0)

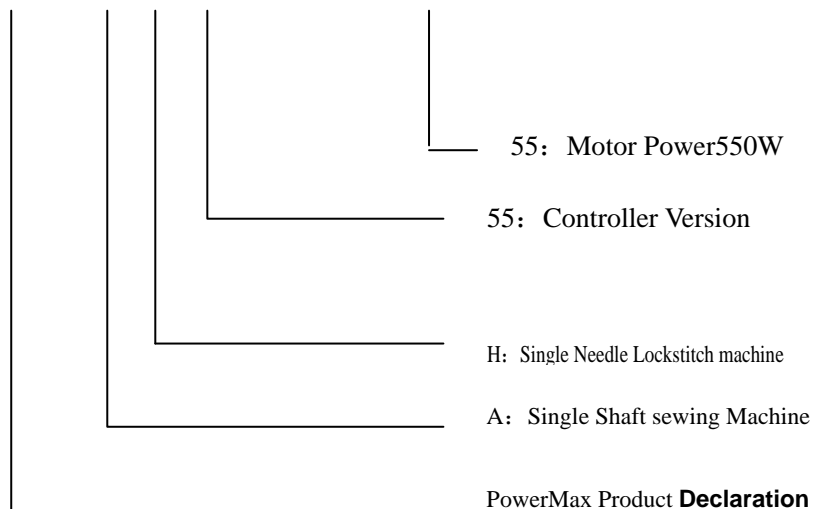


AH55-55

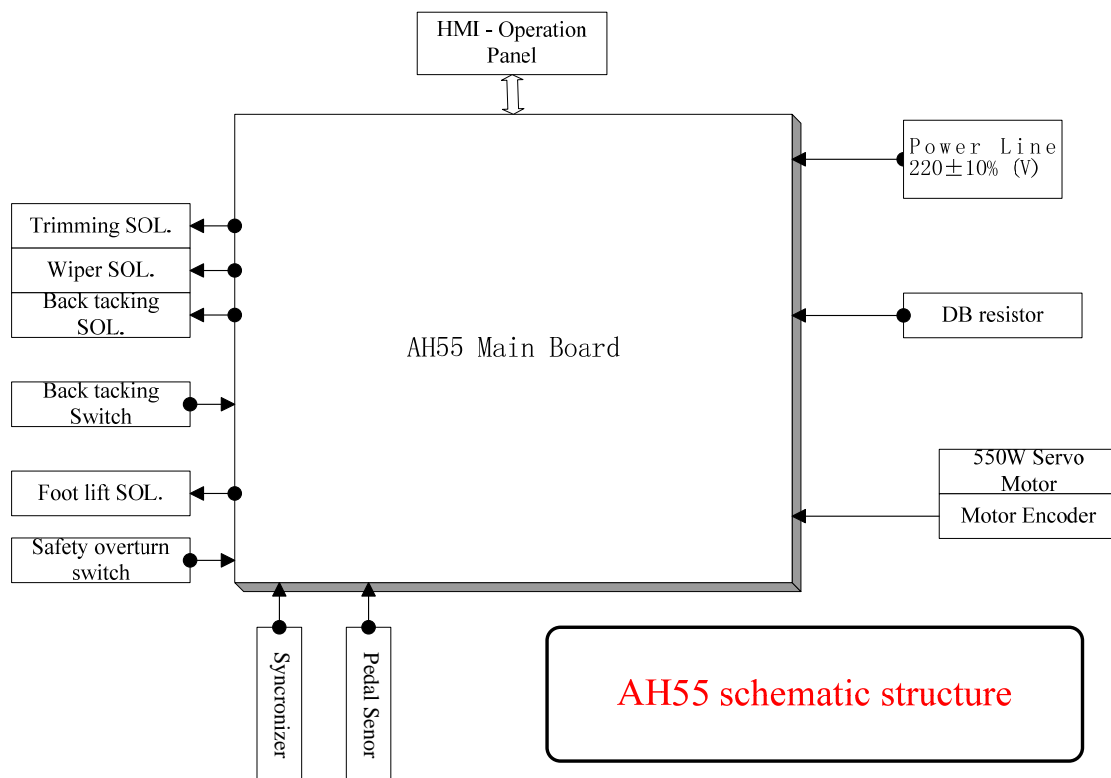
PMX AH55-55 digital AC servo control system is used for driving control for industrial lockstitch sewing machine, it can have stepless control for sewing speed, to complete all types of automatic sewing task in cooperation with lockstitch sewing machine. Sewing equipments with servo controller can be time-saving, labor-saving, highly efficient and energy conserving.

1. Model Declaration:

PMX AH55-----55



2. System schematic diagram:



3. Functions and Features table:

Controller type	AHU55-55	AHD55-55
Motor Type	Belt Driven AC Servo Motor	Direct Driven AC Servo Motor
Voltage Range	AC 220±20% V 50/60HZ	AC 220±20% V 50/60HZ
Output Power	550W	550W
Max. Sewing Speed	5000rpm	5000rpm
Max. Back tacking Speed	0~2200rpm	0~2200rpm
Max. Torque	3Nm	3Nm
Nimble Positioning	★	★
Needle up/ Correction	★	★
Soft Start	★	★
Presser Foot Lift	★	★
Thread Trimming, Thread Wiping, Back tacking	★	★
Overload Protection	★	★
Operation Panel	Optional Parts	Optional Parts

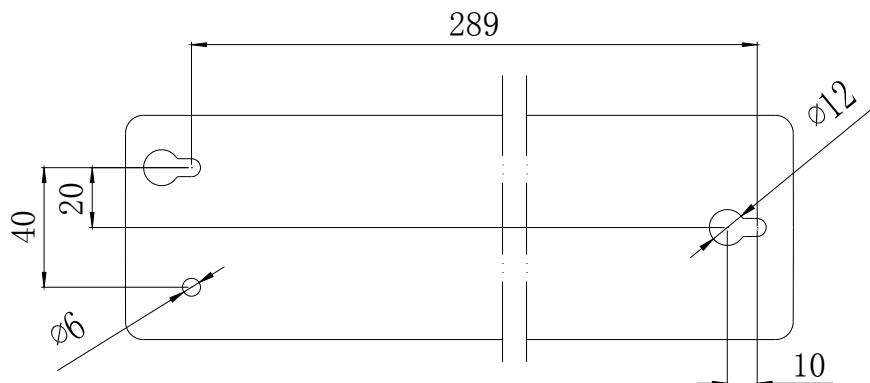
◆ **The controller feature:**

- Low inertia, high speed, medium torque servo motor, precise torque control makes it applicable for thin/medium material lockstitch sewing machine;
- One Needle Positioning: for both needle up and down, the system will locate it at the exact position;
- **Speed control range: 0-5000RPM.** Needle up/Down Correction, Thread Trimming, wiping, Back tacking, presser foot lift control.
- Needle Position Accuracy: $\pm 3^\circ$.
- Thread trimming, thread wiping, back tacking, presser foot lift solenoid short circuit protection to make the power circuit more reliable;
- Low noise, low vibration and high efficiency.
- Hardware and software over current protection, hardware and software over-voltage / under-voltage protection to make the controller more reliable;
- Fool-proof design of controller exterior interface to make the connection safe, reliable, and unmistakable. Easy installation and adjustment; unique digital analog signal logic, timely and reliable pedal action judgment;
- Controller fitting mode is side guided, so that the position for motor is flexible, as is shown in figures 3.1 –3.3.
- Switching mode power supply enables wider range of applicable voltage;
- Applicable for Brother7200, and Juki9000 type sewing machine, oil stub axle direct driven and belt driven lockstitch sewing machine.

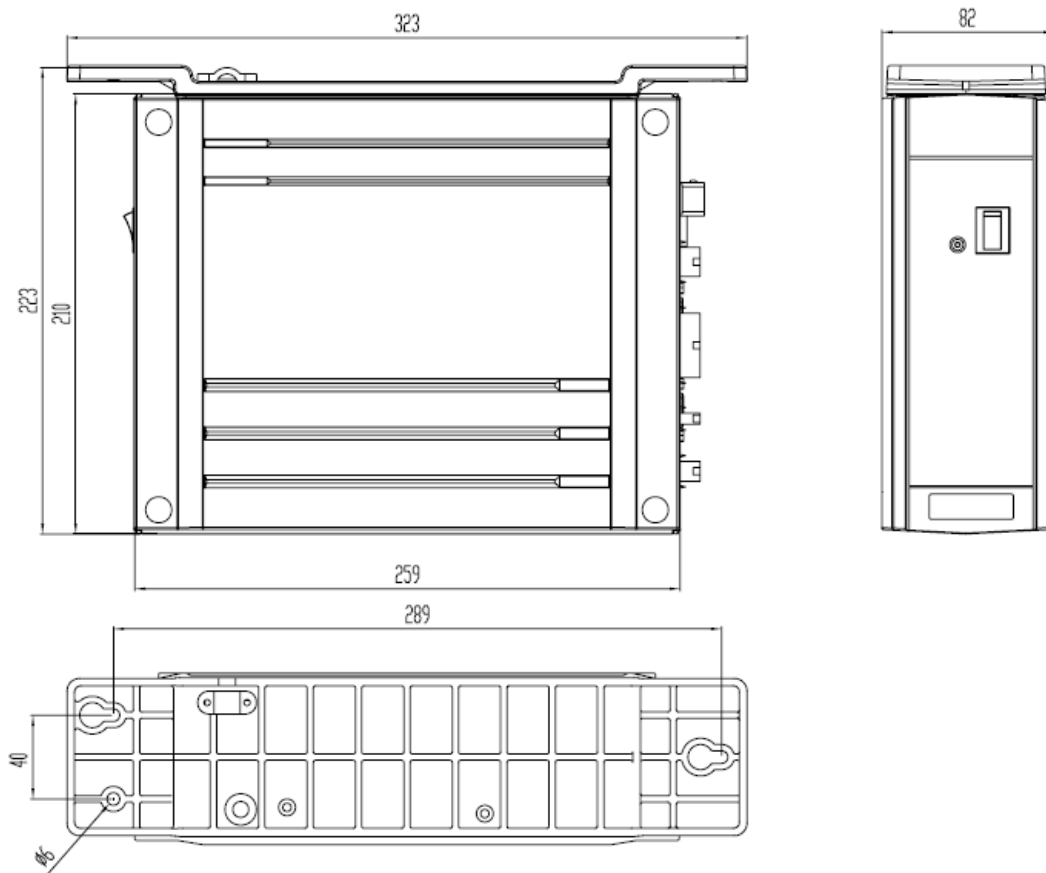
◆ **Features of the subsystem**

- Foot Pedal:
 - ◆ Easy installation and adjustment, unique digital analog signal logic, timely and reliable pedal action judgment;
 - ◆ Forward treading --- stepless speed adjustment, back treading --- twin position sensors for presser foot lift / thread trimming, which make the feet comfortable;
- Operation panel (needle selection box)
 - Easy and reliable operation, with automatic parameter saving and memory;
 - No need to restart after saving new parameter;

4. **AHD(U)55-55 controller hoisting size**



5. controller dimensions



6. Optional parts for the machine head:

- The mounted control panel on the machine head 2MUE06C0200
 - ◆ he unique blue backlit LCD display;
 - ◆ The sewing patterns graphics display.

- Operation panel installation bracket
 - Back fitting bracket (ERP Number: 333P00182)
 - The upper fitting bracket (ERP Number: 383P00186) :
 - Back fitting multi-hole brackets(ERP Number : 383P00175);

- The matching motor
 - 7200 Direct driven motors
 - 9000 Direct driven motors
 - Special stub axle direct driven motor (with concave front cover)
 - Special stub axle direct driven motor (regular front cover)
 - General belt driven lockstitch servo motor(Including pedal and motor bracket).

Annex 1:

Installation and adjustment of the 9000 direct driven motor and positioning substrate

1、 The structure of the direct driven motor is shown as Figure (1)

Notes:

1) The four right-angle holes at the front cover of the motor are used to fix the motor on the head of the sewing machine and the round convex of the front cover should match the axis holes which are in the corresponding operation panel of the sewing machine so as to make the positioning of the motor more accurate and reliable.

2) There are motor encoder devices installed at the back cover of the motor so as to monitor and control the motor.

3) The front axis of the motor is used to install the shaft joint that transfers the power output generated by the motor and drives the sewing machine. The protruding end of the back axis is used to install the positioning sensor devices.

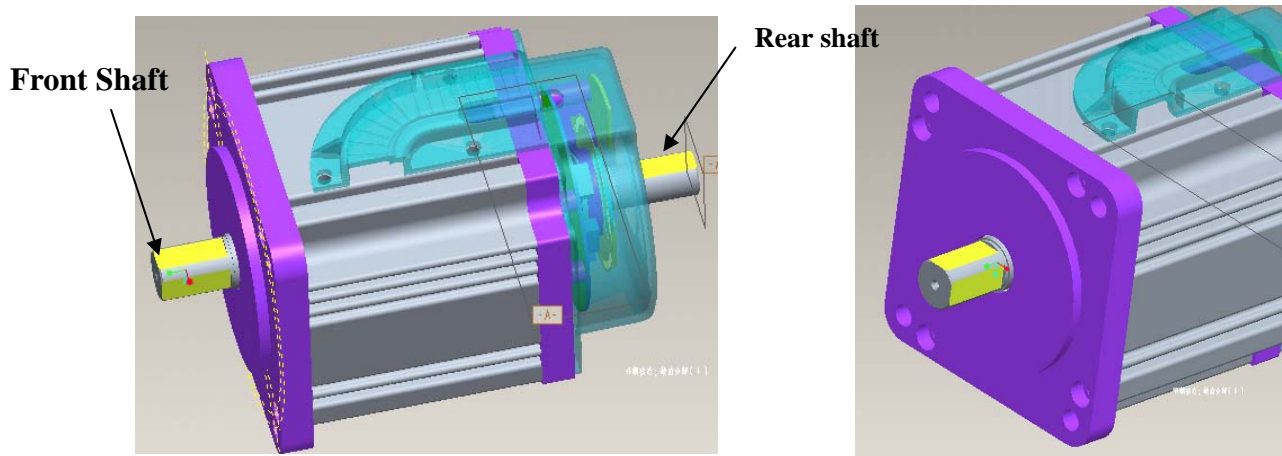


Figure (1) structure of the motor

2、 Installation of the motor and the shaft joint is shown as following Figure (2):

Notes: The two tightening screw holes in the shaft joint should keep tight against the two tightening panels of the motor axis and be fastened.

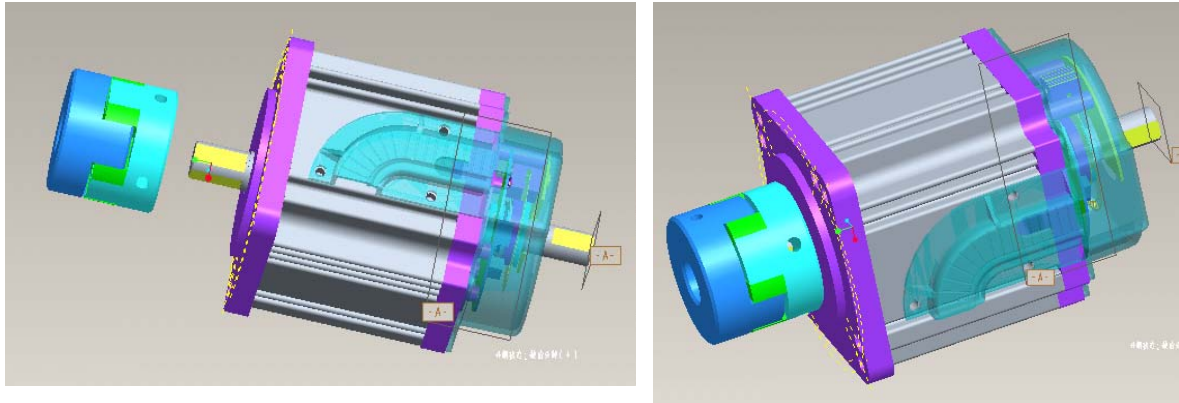


Figure (2) The installation figure of the shaft joint

3、 Installation of the motor and sewing machine is shown in the following figure (3)

Notes:

- 1) The outgoing line of the motor is usually turned downward to make it easy to withdraw the line;
- 2) The front cover of the motor must match the corresponding operation panel of the machine head (the mouths should match and the ends put together), and the four tightening screws should be tightened well. Then the shaft joint and the spindle of the sewing machine should be adjusted to the right position and the shaft joint fixed by the tightening screws.
- 3) The tightening screws of the shaft joint should match the tightening panel of the sewing machine spindle. Generally, according to the relative trend of rotational direction, the first tightening screw should match the tightening panel.

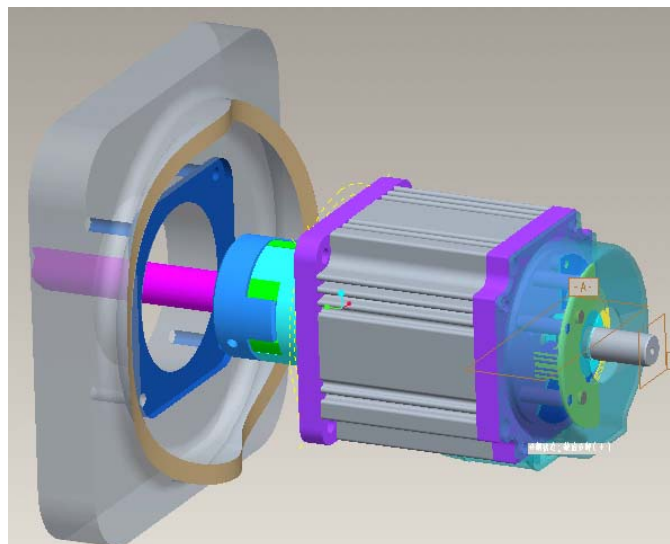


Figure (3) Installation of the shaft joint

4、 Installation of the hand wheel positioning magnet substrate.

The positioning substrate is installed at the hand wheel, which is used by the positioning

sensor to sense the position of the needle. How the substrate is installed could affect the accuracy of the position of the needle in work. Installation of the needle positioning substrate is as follows.

The first washer, up needle positioning substrate, parting slip, correction needle positioning substrate, corrugated washer, the second washer and the $\Phi 18$ clamp spring should be installed one by one into the hand wheel with the order and direction indicated in Figure (4).

Notes:

- A. When installing the up needle substrate, the part with the 0.5mm protruding edge (i.e. the non-smooth side) must face the black inner surface of the hand wheel.
- B. When installing the correction needle substrate, the part without the 0.5mm protruding edge (i.e. the non-smooth side) must be turned towards the black inner surface of the hand wheel.
- C. Installation direction of the magnet of the up needle positioning substrate should follow the figure: the magnet of the up needle should match the opposite direction of the tightening screw hole marked [2] in the fig. 4.
- D. Installation direction of the magnet of the correction needle positioning substrate should follow the figure: the magnet should match the tightening screw hole marked [1] in the fig. 4.
- E. The parting slip should be installed alongside the two circular grooves situated between the up and correction needle substrates.

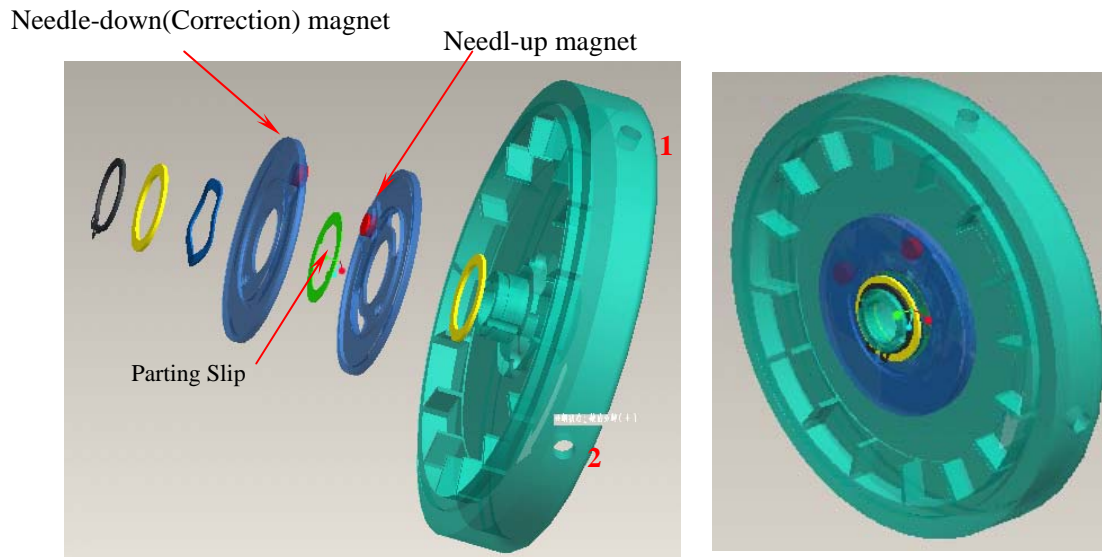


Figure (4) Installation of the hand wheel needle positioning magnet

- 5、 If there is no corresponding hand wheel for the sewing machine or it is not necessary, the installation direction of the needle positioning magnet should be as the following figure (5), a needle positioning substrate installation seat that matches the motor axis is provided and the installation direction is the same as that for the hand wheel.

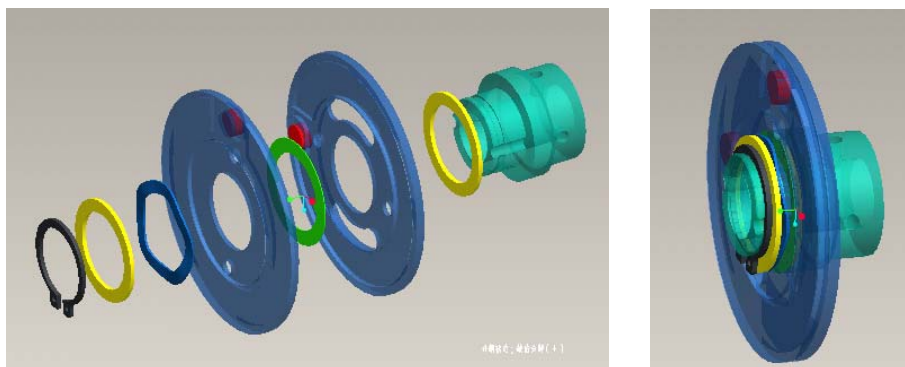


Figure (5) Installation of the needle positioning magnet substrate

- 6、 Installation of the direct driven hand wheel and motor shaft is shown in the following Figure (6).

Notes:

1) The tightening screws on the hand wheels should match the tightening panel of the motor spindle; according to the relative rotational direction trend between the hand wheel and the spindle, the first tightening screw should match the tightening panel, otherwise the adjustment of the needle position would be difficult.

2) If the needle positioning magnet is installed on the installation seat, it is only necessary to fasten the needle positioning magnet substrate with the installation seat and the motor axis, as the calibration of the needle position is irrelevant to the position of the magnet sensor.

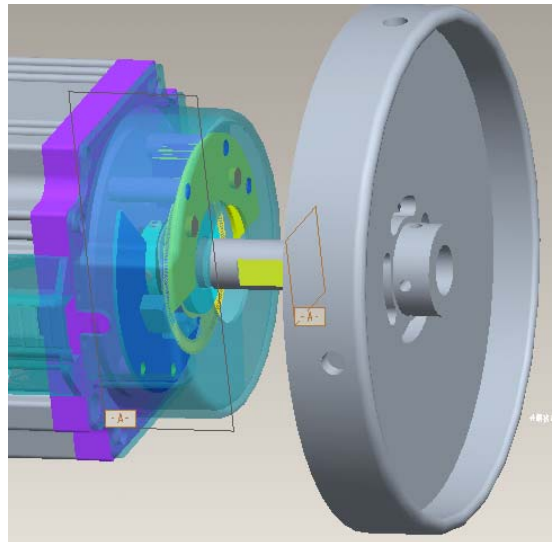


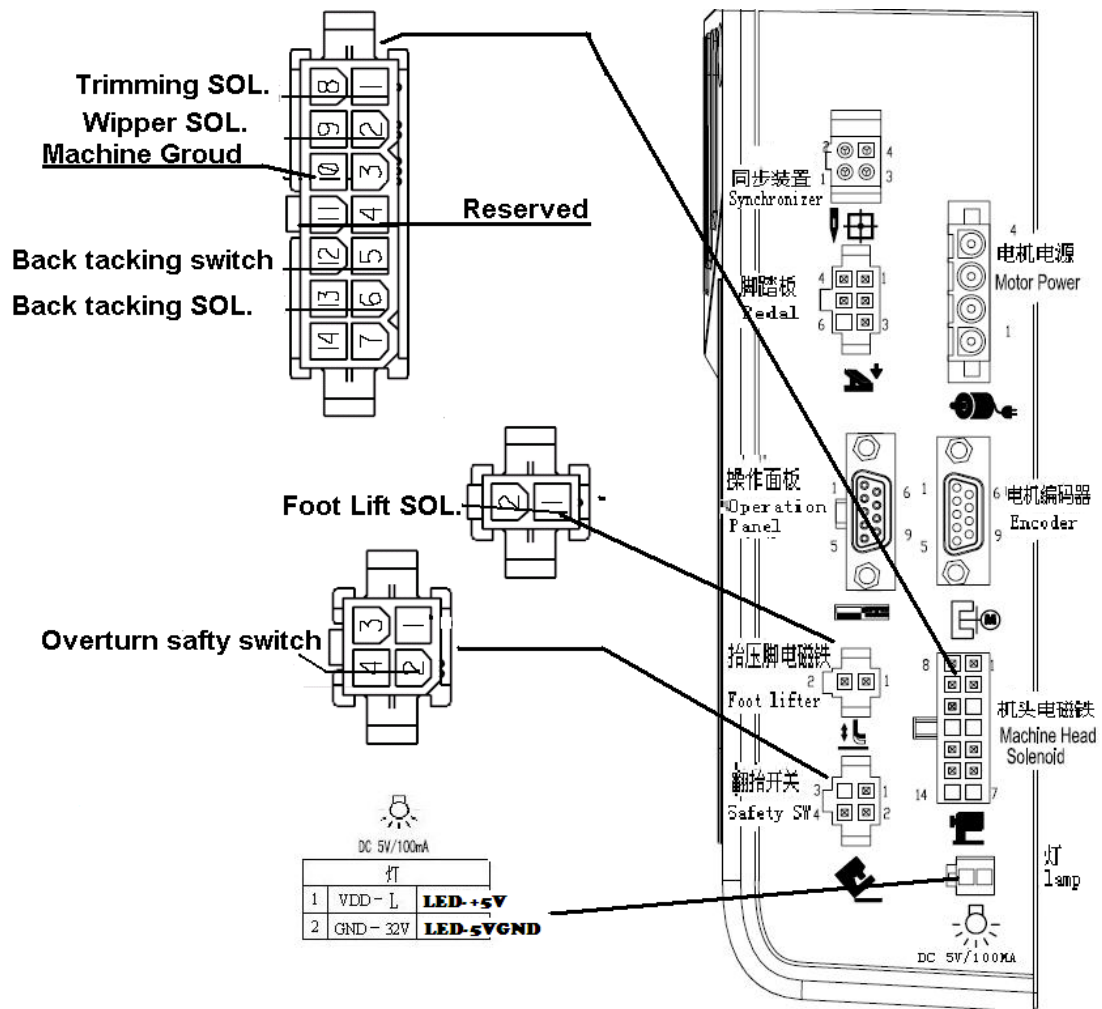
Figure (6) Installation of the hand wheel and the motor

7、 Adjustment method of up and correction needle positioning magnet substrate in trial operation

1) When the computer driver is on, rotate the hand wheel to make the needle stop at the up needle position, keep the position of hand wheel fixed with the left hand, with the right hand, use the up and correction needle position adjustment handle, rotate the up needle position magnet substrate. Observe the little hole in the hand wheel, when there is blue light coming out from the hole, the adjustment of the up needle position substrate is completed.

2) Then, rotate the hand wheel to make the needle stop at correction needle position. Keep the position of hand wheel fixed with the left hand, with the right hand, use the up and correction needle position adjustment handle, rotate the correction needle position magnet substrate. Observe the little hole in the hand wheel, when there is blue light coming out from the hole, the adjustment of the correction needle position substrate is completed.

3) When the needle positioning magnet substrate is not installed on the corresponding hand wheel, the method of adjustment is the same.



Attention: LED power output only suitable for driving the parallel design circuit witch need 5V source.

Appendix Figure 1 Definition of new side guide direct driven controller solenoid wiring

Updating record:

1. V1.0 initial version -20091020;