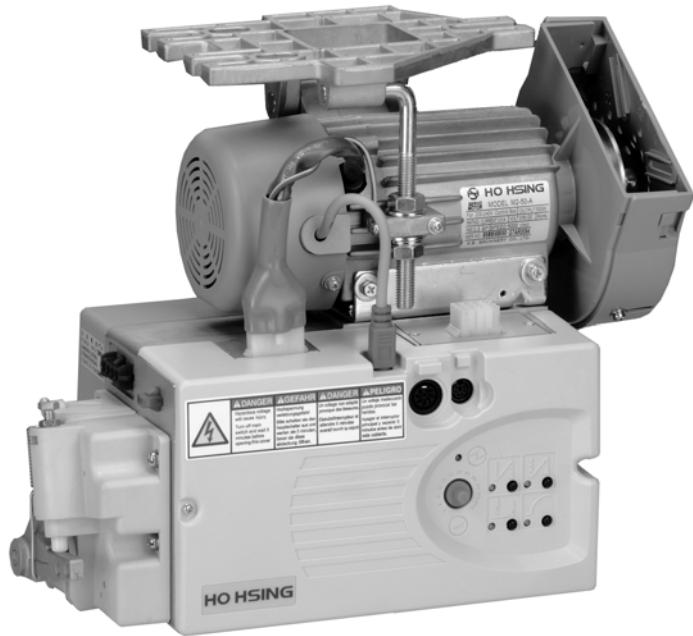


MA SERIES USER MANUAL

CONTENTS

1. Safety Precaution
2. Installation
3. Wiring and Grounding
4. Control Panel
5. Error Code List



HSVPMU01-0

2008.03

EC Declaration of Conformity

We hereby declare that the following products:
AC servo motor--MA · MB · MD · ME · MH · MF series
are in conformity with the provision of the EC
directives as following :

-EC Low Voltage Directive (73/23/EEC)
-EC Electromagnetic Compatibility Directive
(89/336/EEC)

-EC Machinery Directive (98/37/EC)

Applied harmonized standards :

EN 60204-31 : Electrical equipment of industrial
machines. Particular requirements for sewing
machines, sewing units and sewing system.

EN 292-1 : Safety of machines.

EN 292-2 : Safety of machines, technical
guidelines and specifications.

EN 61000-6-2 : EMS for industrial environment.

EN 61000-6-3 : EMI for residential environment.

Declaration of Conformity for Concentration Limits for Certain Hazardous Substances

We hereby declare that the following products:
AC servo motor--MA · MB · MD · ME · MH · MF series
are complies with the following directives and
requirements :

1. European Union RoHS Directive (2002/95/EC) and
the concentration limits for certain hazardous
substances (2005/618/EC)

2. People's Republic of China Electronic Business
Standard : Requirements for concentration limits for
certain hazardous substances in electronic
information products (SJ/T 11363-2006)

Our product itself (motor, control box) or its packing
materials and accessories (box, screws package,
user manual, sticker, label, print...etc.) or the
suppliers of parts and raw materials are all in
conformity with the provision of the European Union
RoHS Directive and People's Republic of China
Electronic Business Standard to conform the
following concentration limits for the six hazardous
substances :

Hazardous Substance	Permissible Values
Lead (Pb)	Less than 240 ppm
Mercury (Hg)	Less than 800 ppm
Cadmium (Cd)	Less than 80 ppm
Hexavalent chromium (Cr VI)	Less than 800 ppm
Polybrominated Biphenyl (PBB)	Less than 800 ppm
Polybrominated Diphenyl ether (PBDE)	Less than 800 ppm

* The concentration of lead in the lead-free process
for PCB shall be less than 800 ppm.

* For packing materials shipped with our products
or parts, the hazardous substances shall be 80
ppm or less in sum of Pb+Hg+Cd+Cr VI.

H. S. Machinery. Co., Ltd.

Mr. C. H. Tai
Plant Manager

1. Safety Precaution :

Please read this manual with sewing machine manual thoroughly and pay attention for the following safety precaution.

- Installation and operation must be done by the trained personnel, also turn off the power switch and remove the plug from outlet and wait for 5 minutes before any installation.
- This product is designed for the specific sewing machines and must not be used for other purposes.
- Only use the power voltage as described on the name plate of the MA motor and control box in $\pm 10\%$ ranges.

⚡ Attention : If the control box is AC 220V system, please don't connect to the AC 380V power outlet, otherwise the error will occur and panel LED will blink continually. If that happened, please turn off the power switch immediately and check the power voltage. Continue supply the 380V power over 5 minutes might damage the fuses (F1,F2) of EMI board and burst the electrolytic capacitors (C4,C5) of power board and even might endanger the person safety.



- In order to prevent abnormal operation, keep the product away from the high frequency machines.
- Don't operate in direct sun light · outdoors area and the room temperature is 45°C above or 5°C under.
- Don't operate near the heater · dew area and the humidity is 30 % less or 95% more.
- Don't operate in dusty · evaporate · combustible gas area, and stay away from corrosive material.
- Don't apply heavy objects or excessive force on the power cord, also don't bend or pull the power cord.
- Power cord must keep 3 cm or above distance away from the V-belt and the pulley.
- In order to prevent the static interference and current leakage, all grounding works must be done properly.
- After power on the machine for the first time, use low speed to operate and check the correct rotation direction.
- During machine operation, don't touch any moving parts.
- All moving parts must have protective device to avoid the body contact and objects insertion.
- Maintenance and repair must be done by the properly trained technician, also all the spare parts for repair must be approved or supplied by the manufacturer.
- Don't use any objects or force to hit or ram the product.

Danger and caution signs



Risks that may cause personal injury or risk to the machine are marked with this symbol in the instruction manual.



This symbol indicates electrical risks and warnings.

Limited Warranty

Warranty period of this product is 1 year from purchasing, or 18 months from our manufacturing date.

Warranty Detail

Any trouble found within warranty period under normal use condition in conformance with this manual, it will be repaired free of charge. Repair will be chargeable in the following cases even if within warranty period :

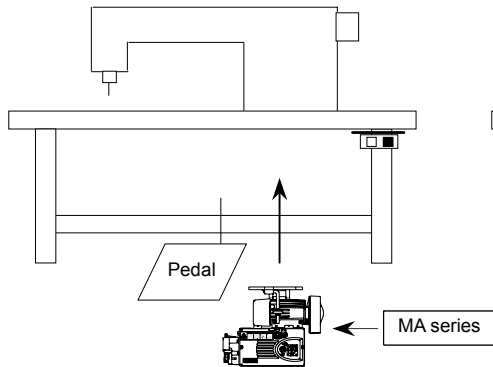
1. Inappropriate use include: wrong connecting high voltage, wrong application, disassemble, repair, modification by incompetent personnel, or operate the product without the precaution, or operate the products out of its specification range. Insert odd objects or liquids into the product.
2. Damage by fire, Earth quake, lightning, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.
3. Dropping after purchase, or damage in transportation by customer himself. (or by customer's shipping agency)

Note : We put our best effort and mind in testing and manufacturing for assuring the quality and reliable of this product. But it is possible this product can still be damaged due to external magnetic interference and electronic static or noise or unstable power source more than expected; therefore the grounding system of operate area must be well-connected to this product and it's also recommended to install a failsafe device. (such as residual current breaker).

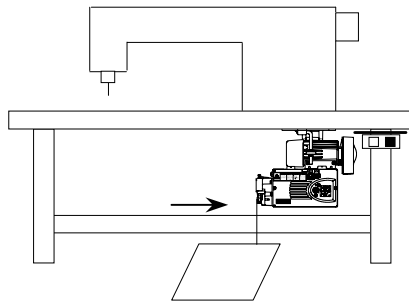
2. Installation :

MA installation

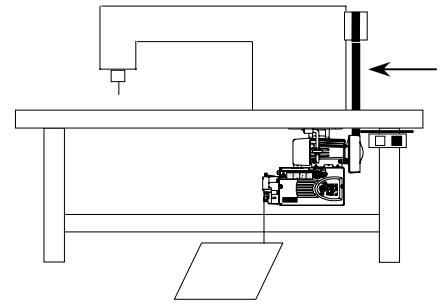
a). Install the motor and control box under the table



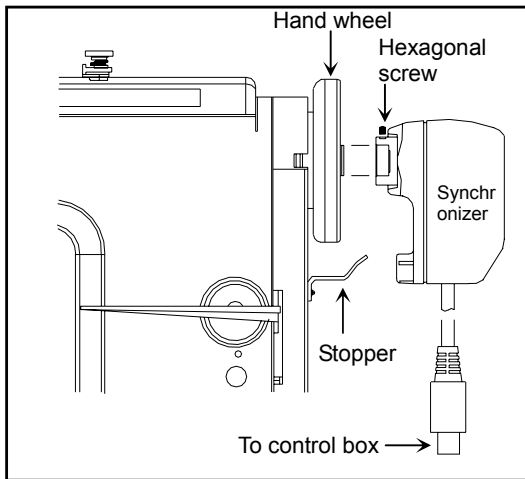
b). Install the pedal with speed control unit.



c). Install the V-Belt on the motor and machine pulley, then adjust the belt to its appropriate tension.



Synchronizer installation



Caution :
For person safety, turn off the power switch and remove the power plug from outlet before any adjustment.

Synchronizer Adjustment (Please open the top cover first)

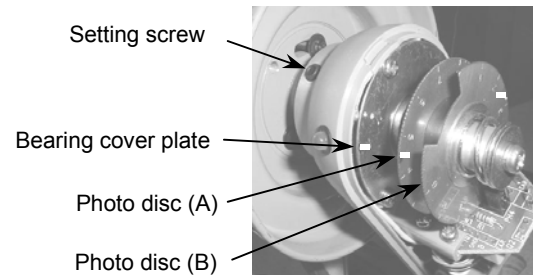
Needle up position : Rotate the machine pulley to reach mechanical needle up position and turn the photo disc (A) until its red mark is aligned with the red mark on the bearing cover plate.

Needle down position : Rotate the machine pulley to reach mechanical needle down position and turn the photo disc (B) until its blue mark is aligned with the red mark on the bearing cover plate.

Note: Instruction above is the standard adjustment. If you feel the position wasn't accurate, please do the fine tuning by yourself.

Mounting the Synchronizer onto the flange of hand wheel and match the stop groove of the synchronizer with the stopper of the machine head then tighten and secure 2 hexagonal screws of the synchronizer rotor, then connect the synchronizer cable to the control box.

Note : Stopper type and location might be varied, depend by the machine model.



Speed control unit adjustment



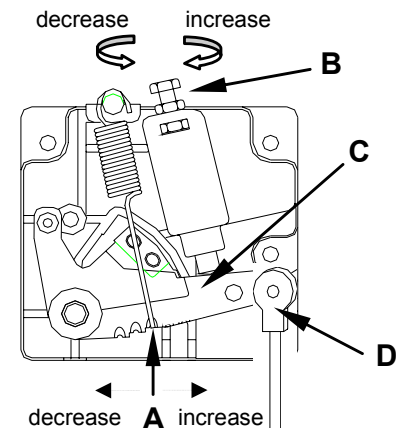
Caution :

For person safety, turn off the power switch and remove the power plug from outlet before any adjustment.

Components of speed control unit : see figure

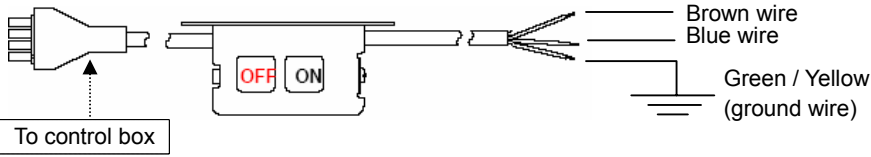
- A : Spring for toeing forward force adjustment
- B : Bolt for heeling backward force adjustment
- C : Pedal arm
- D : Pitman rod for pedal

	Term of adjustment	Adjustment result
1	Toeing forward force adjustment	Spring A move to right = force increased Spring A move to left = force decreased
2	Heeling backward force adjustment	Bolt B turn = force decreased Bolt B turn = force increased
3	Pedal stroke adjustment	Rod D secure at right = stroke is longer Rod D secure at left = stroke is shorter



3. Wiring and Grounding :

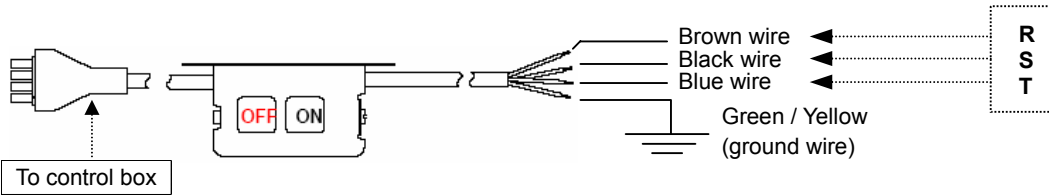
Single phase (AC220V)



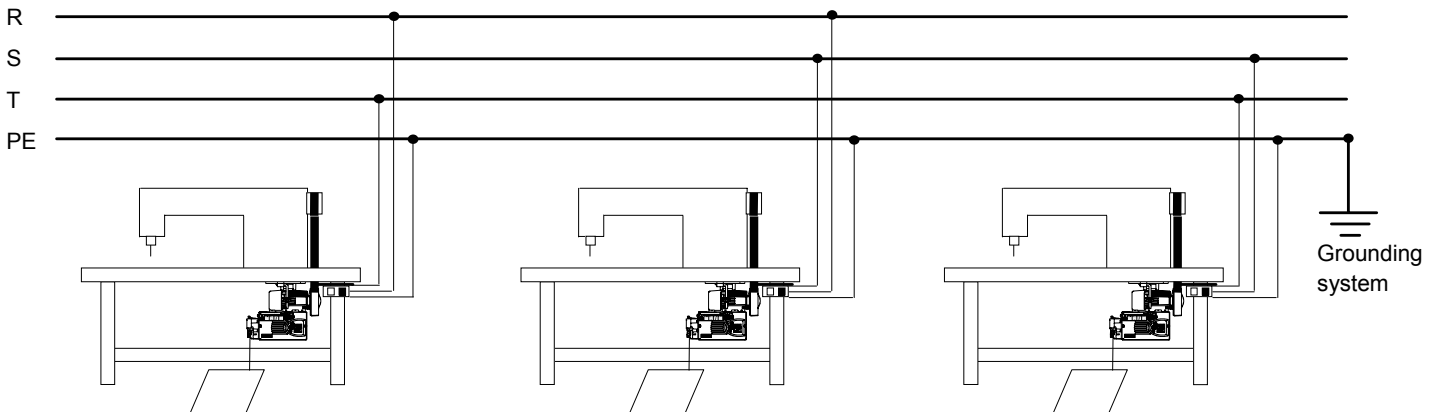
Caution :

1. Green / Yellow wire is for grounding, and all grounding works must be done properly.

Three phase (AC380V)

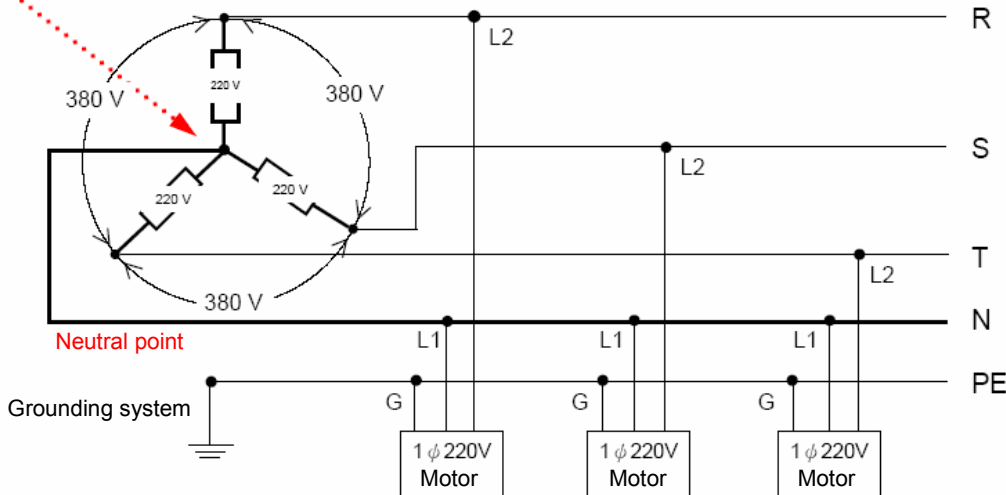


When multiple 1 Φ / 220 V motors are connected to a 3 Φ / 220 V power source, take caution for the load balance of each R, S, T phase, see the following diagram :



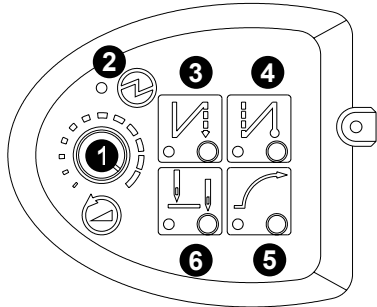
How to connect a 1 Φ / 220 V power from a 3 Φ / 380 V power source

Attention : Must have a neutral point layout

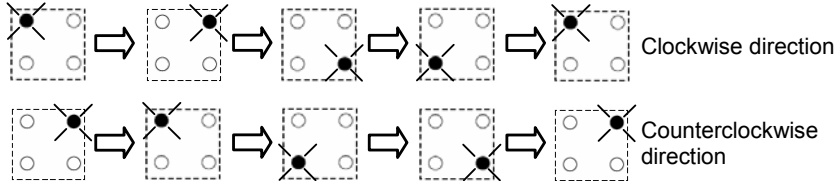


Caution : If the power source does not have the neutral point, then this 1 Φ / 220 V servo motor is not suitable for this connection. Please ask supplier to offer our 3 Φ / 380 V servo motor.

4. Control Panel :



After power ON, the ③, ④, ⑤, ⑥ 4 LEDs will blink and run in a clockwise or counterclockwise direction 2 times which indicate the motor rotate direction, then 4 LED blink together 2 times and stop which confirm the LEDs are in good condition.

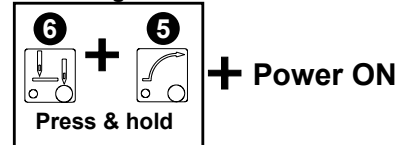


Control panel key functions :

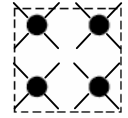
- ① **Sewing speed adjust knob**
Knob turn counterclockwise : speed down.
Knob turn clockwise : speed up.
- ② **Power ON LED**
Power ON, LED ON.
Power OFF, LED OFF.
- ③ **Start back tacking**
LED ON=function ON. / LED OFF=function OFF.
- ④ **End back tacking**
LED ON=function ON. / LED OFF=function OFF.
- ⑤ **Slow start**
Press the key, LED ON=function ON.
Press the key, LED OFF=function OFF.
- ⑥ **Needle stop (up/down) position when motor stop**
Press the key, LED ON : Stop at UP.
Press the key, LED OFF : Stop at DOWN.

RESET to the factory setting :

When control box need to recover the factory default setting, see the following for instruction :



After RESET, the ③, ④, ⑤, ⑥ 4 LEDs will blink together 4 times to indicate the setting has completed.



Change motor rotate direction :

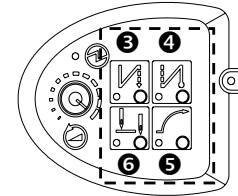


After counterclockwise or clockwise direction changed, confirm the correct running direction of the ③, ④, ⑤, ⑥ 4 LEDs.

5. Error Code List :

Panel LED for error code :

1. When MA control box is malfunction or abnormal, the error message will be warned by the blinking of ③, ④, ⑤, ⑥ 4 LED on the control panel. (See the following list)
2. Repair and maintenance must be performed by the properly trained technician.



Panel LED blinking	Error code	Cause of the problem	Condition and solution
	ER0. 1	1. Power module detected error. 2. Abnormal over current occurred.	Motor and machine will be shutting down. Please check the power module. Please check the power board over current protection circuit.
	ER0. 4	1. When power on, higher power voltage has been detected. 2. Connect to a wrong AC power source. 3. Aluminum casing resistor for the brake circuit is defective or power board F1 fuse burst.	Motor and machine will be shutting down. Please check the AC power source. *If control box is AC 220V system, don't use the AC 380V power voltage, otherwise the panel LED will blink continually after 2 second of power ON. If continue supply the 380V power, the electrolytic capacitors (C4,C5) of power board will burst open over a period of time and cause the fuses (F1,F2) of EMI board open circuit. Please check the power board. Please check the aluminum casing resistor and power board F1 fuse.
	ER0. 5	1. When power on, lower power voltage has been detected. 2. Connect to a wrong AC power source.	Motor and machine will be shutting down.. Please check the AC power source Please check the power board.
	ER0. 7	1. Bad connection to the motor connector. 2. Synchronizer (sensor) signal error. 3. Machine locked or object stuck in the motor pulley. 4. Sewing material is too thick.	Motor and machine will be shutting down. Please check the motor or motor connectors' connection. Please check the synchronizer (sensor) and its signal. Please check machine head to see if any objects stuck in the motor pulley, or machine does not rotate smoothly.
	ER0. 8	Operation box to CPU interface has communication error.	Motor and machine will be shutting down. Please check the operation box.
	ER0. 9	1. Machine solenoid shorted. 2. Main board's power transistor circuit was defected.	Motor still can run, but all output signals and operation box's pattern sewing function will be invalid. Please check machine's solenoids or the resistance value is 2 Ω less. Please check all the power transistors which related to solenoid
	ER0. 11	If parameter 【121.ANU】 is set ON, but motor can not find the needle up position signal when power on.	Motor and machine will be shutting down. Please check synchronizer's up position signal. Please check control box. Please check machine head to see if any objects stuck in the motor pulley, or machine does not rotate smoothly.
	ER0. 12	Power on, no synchronizer signal was detected or synchronizer is not connected.	Automatic starts the clutch mode. Please check the synchronizer and its connection.
	ER0.16	1. Safety switch is defected or bad connection. 2. Parameter 【075.SFM】 setting not match the machine head model.	Motor stopped Please check the safety switch. Please check parameter 【075.SFM】 setting, make sure it match machine head's safety switch.

If you need the technical support, please contact your distributor or browse our website at <http://www.hohsing.com>