AHE58/59 AC Servo System

HMI-12 User Manual

Safely INstruction

- Please read this manual carefully, also with related manual for the machine head before use.
- For perfect operation and safety, installing and operating this product by trained personnel is required.
- To avoid the abnormal running, please keep the product away from the high electromagnetic machine or electro pulse generator.
- Please don't operate when environment temperature is above 45°C or below 0°C.
- Avoid operating in the area where humidity is 30% less and 95% more, also keep away from dew or acid spray area.
- Effective and stable ground connection is a must.
- All the maintenance parts need to be approved or provided by delegation.
- Turn off the power and unplug the cord before mounting motor and any accessories
- To avoid the static interference and current leakage, all grounding must be done. Use the correct connector and extension wire when connecting ground wire to Earth and secure it tightly.
- Power must be turned off first, when:
  (1).Uninstall the motor or the control box, or plug and unplug any connector.
  (2). Turn off the power and wait 5 minutes before opening box cover.
  (3). Raising the machine arms or changing needle, or threading needle. (Shown as above)
  (4). Repairing or doing any mechanical adjustment.
  (5). Machines rest.
- Regulation in Maintenance and Repairs :
  (1). Maintenance and repairs must be done by trained personnel.
  (2). Don't use any objects or force to hit the product.
  (3). All spare parts for repair must be approved or supplied by the manufacturer.

1 Installation Instructions

1.1 Product specifications

Product Type	AHE58-55	Supply Voltage	AC 220 ± 44 V
Power frequency	50Hz/60Hz	Maximum output power	550W

1.2 Interface plug connections

The pedals and the machine head of the connector plug are mounted to the corresponding position in the controller back of socket, as shown in Figure 1-1. Please check if the plug is inserted firmly.

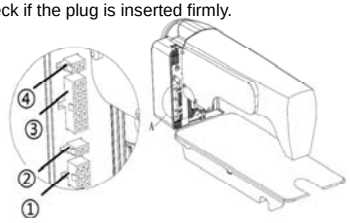
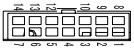


Fig.1-1 Controller Socket Diagram

①Pedals socket; ② Foot lifter solenoid socket ; ③ Machine head solenoid socket; ④ LED light socket(black);

⚠: The use of the normal force are not inserted into the plug and socket, please check whether the matching, direction or needle insertion direction is correct! Lighting interface and presser foot lifting electromagnet interface is a 1*2 interface, head lamp interface using black interface, please pay attention to the distinction .

Foot Lifter		
1	VDD	+32v
2	Dout	Dout3

OUT 3

Pedal interface		
1	Pedal	Pedal signal
2	GND	5V GND
3	VCC	+5V
4	Din6	Singal 6
5	Din5	Singal 5
6		

Note:Terminal 4and5 are not useless to control

Machine Head solenoid				
	5 Output		4 Output	
1	VDD (+32V)	+32V	VDD (+32V)	+32V
2	VDD (+32V)	+32V	——	——
3	+5V	+5V	+5V	+5V
4	GND (+32V)	32V GND		
5	GND (+32V)	32V GND	GND (+32V)	32V GND
6	VDD (+32V)	+32V	VDD (+32V)	+32V
7	VDD (+32V)	+32V	VDD (+32V)	+32V
8	JX	Trimming	JX	Trimming
9	BX	wiping	——	——
10	——	——	——	——
11	Din2	FILL NEEDLE	Din2	FILL NEEDLE
12	Din1	Back tack SW.	Din1	Back tack SW.
13	DF	Back tack	DF	Back tack
14	SX	Nipping	SX	Nipping/Wiping

JX
BX
DF
SX

Fig.1-2 Controller Interface Definition

1.3 Wiring and Grounding

We must prepare the system grounding project, please a qualified electrical engineer to be construction. Product is energized and ready for use; you must ensure that the power outlet the AC input is securely grounded. The grounding wire is yellow and green lines, it must be connected to the grid and reliable security protection on the ground to ensure safe use, and prevent abnormal situation.

⚠: All power lines, signal lines, ground lines, wiring not to be pressed into other objects or excessive distortion, to ensure safe use!

2 Operation Panel Instructions

2.1 Operation panel display instruction

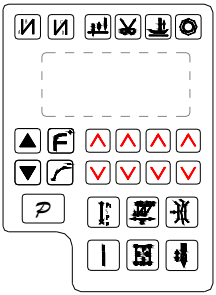


Fig.2-1 Operation Panel

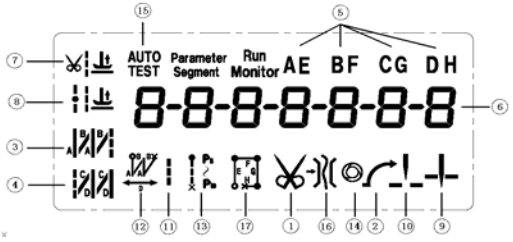


Fig.2-2 LCD Display

Index	Icon	Description	Index	Icon	Description
①		Automatic Trimming	⑩		Position up
②		Soft start	⑪		Free Sewing
③		Start back tacking	⑫		Bar Tack Sewing
④		End back tacking	⑬		Multi-section Constant-Stitch Sewing
⑤	AE BF CG DH	Sewing segments index	⑭		One-shot Sewing
⑥	8 8 8 8 8 8 8	Number Display	⑮	AUTO TEST	Automatic Test
⑦		Presser Foot Lifting after trimming	⑯		Thread clamp
⑧		Presser Foot Lifting at Seam End	⑰		Four-segment Constant-Stitch sewing
⑨		Position Down			

2.2 Key functions

Key	Name	Description
	**Parameter setting key**	Use the key to switch to the program mode. The key is parameters confirm key, and back to the previous menu until the operator sewing mode state. In addition, work with other key to set a higher level of the parameter.
	**Start back tacking setting key**	Switch during all start tacking type when pressing. (No tacking, Once tacking, double tacking, 4 repeat tacking). Tacking stitches A、B can be set using the key and the key.
	**End back tacking setting key**	Switch during all end tacking type when pressing. (No tacking, Once tacking, double tacking, 4 repeat tacking). Tacking stitches C、D can be set using the key and the key.
	**Free sewing**	1). As the pedal is toed down, machine will start sewing. Once the treadle returned to neutral, machine will stop immediately. 2). As the pedal heeled back, the trimming cycle will be finished automatically.
	**Bar tack sewing**	Once the pedal is toed down, all the seams of Bar Tacking, A、B sections will be completed with D times, and the trimming cycle will be finished automatically. **Note：When the bar tack sewing start, it will not stop until the trimming cycle finished, except for the pedal heeled back to cancel the action.**
	**Four-section constant-stitch sewing**	1). As the treadle is toed down, Constant-stitch Sewing E、F、G or H performed section by section. 2).Once the pedal returns to neutral intermediately in any one section, the machine will stop immediately. When the pedal toed down again the balanced stitches of E、F、G or H goes on. 3). If the one-shot sewing key is set, the machine will not stop and automatically start trimming cycle and end back tacking at the end of the last section H.
	**Multi-section constant-stitch sewing**	As the treadle is toed down, Constant-stitch Sewing P01、P02、P03 etc. performed section by section. As following, P040 H16, 1st number is total sections, 2nd number is which section, and 3rd number is the stitches of the section. P04 is total segment, use key and the key to adjusting, the default maximum 24 segments, -01 as the current setting segment, -16 as the sewing needle NO.of the current segment, they are used the key and the key to adjusting.
	**Soft start setting key**	Soft start at the first seam is enabled (icon on) or disabled.
	**Clamp setting key**	Clamp function is enabled (icon on) or disabled.
	**Forward stitch correction**	One touch of this key act as stitch correction.
	**Trimming cycle selection**	Enable or disable the trimming cycle.
	**Presser foot lifting mode**	Switch during all presser foot lifting mode when pressing the key. (No lifting, lifting after trimming cycle only, lifting at machine stop only, lifting at machine stop and after trimming cycle both).
	**One-shot-sewing selection**	In Constant-stitch sewing：a. One shot to the pedal, automatic performed number of stitches of every section. b. Toe down the pedal again and again to finish rest the sections until it finish pattern.
	**Custom function key**	Special function according to the custom requirement.

Key	Name	Description
▲ ▼	**Increasing and decreasing motor speed**	The maximum motor speed can be adjusted using the keys.
^ v	**Up and down keys**	Adjust the values in plus and minus state.

3 System Parameters Setting List

3.1 Technician mode

NO.	Range	Default	Description
100	100~800	200	Minimum speed
101	200~5000	3500	Maximum speed
102	200~5000	3000	Constant-stitch sewing speed
105	100~500	250	Trimming speed
106	0 / 1	0	Soft start mode: 0：Soft start only after trimming 1：Soft start after both trimming and stop
107	1~9	2	Stitch numbers for soft start
108	100~800	200	Soft start speed
110	200~2200	1800	Start back tacking speed
111	200~2200	1800	End back tacking speed
112	200~2200	1800	Bar tacking speed
113	1~70	24	Stitch balance for start back tacking No.1
114	1~70	20	Stitch balance for start back tacking No.1
115	1~70	24	Stitch balance for end back tacking No.3
116	1~70	20	Stitch balance for end back tacking No.4
117	1~ 100	90	Stitch balance for back tacking speed (P107 - Tacking stitches A = 1)
118	1~ 100	30	Stitch balance for back tacking speed (P107 = Tacking stitches A)
11b	0~4	0	Start and end back tacking type (CD and AB) 0:B->AB->ABAB->none 1:B->none 2:B->AB->none 3:AB->none 4:AB->ABAB->none
11C	0~9999	0	Tens digit for each segment of A/B/C/D
11d	0~9999	0	Tens digit for each segment of E/F/G/H
11E	0~9999	0	Tens digit for each segment of A/B/D
11F	0~359	0	Back tacking under angle control
130	0 / 1 / 2 / 3	2	Speed curve adjustments: 0：ramp curve 1：polygonal curve. 2：quadric curve 3：S-type curve
131	200~4000	3000	The turning point speed of two segment curve.
132	0~ 1024	800	The turning point sampling voltage of the pedal when two segment curve (Between parameter 138 and 139)
133	1 / 2	1	The type of polygonal curve: 1: square 2：rooting
134	0~ 1024	90	Trimming point of pedal
135	0~ 1024	300	Footer lifting point of pedal
136	0~ 1024	460	Neutral point of pedal
137	0~ 1024	480	Motor running point of pedal in low speed.

Figure 4-1 shows the specific setting method

138	0~1024	580	Accelerated point of pedal
139	0~1024	962	Max speed point of pedal
13A	0~800	100	The running delay time of footer lifting
140	0 / 1	1	Soft start at the first cycle of power ON. 0: Disable 1: Enable
141	0 / 1	1	Auto bar tacking function: 0: Disable 1: Enable
142	0 / 1	0	Bar tacking mode selection: 0: Juki mode. Active when motor stop or running. 1: Brother mode. Active only when motor running.
143	0 / 1 / 2 / 3	0	Special mode: 0: Normal mode 1: Simply sewing mode 2: Motor initial angle measurement (Do not remove the belt) 3: Automatically setting the pulley ratio by the CPU. (synchronizer is necessary and the belt not removed)
144	0~31	0	Feedforward torque of motor: 0: Normal functions 1-31: Feedforward torque level
148	0 / 1 / 2	0	Mode of stitch correction 0: continuous; 1:half stitch; 2: one stitch
149	0~10	0	The time of chopping on for the presser foot slow down (uint is 100us)
14C	1~9999	40	The time of chopping off for the presser foot slow down (uint is 100us)
150	1~100	1	The proportion coefficient of the stitches counter
151	1~9999	1	Maximum stitches of the counter
152	0~6	0	Count mode selection (For Bobbin Thread) 0: The counter is invalid 1: Count up by stitches. When count over, counter will be auto-reset. 2: Count down by stitches. When count over, counter will be auto- reset. 3: Count up by stitches. When count over, motor stops and the counter must be reset by the external switch or the P key on the panel. 4: Count down by stitches. When count over, motor stops and the counter must be reset by the external switch or the P key on the panel. 5: Count up by trimming. When count over, panel alarms and motor stops after trimming. 6: Count down by trimming. When count over, panel alarms and motor stops after trimming.
153	1~100	1	The proportion coefficient of the pieces counter
154	1~9999	1	Maximum pieces of the counter
155	0~4	0	Count mode selection (For Sewing Piece) 0: The counter is invalid 1: Count up by pieces. When count over, counter will be auto- reset. 2: Count down by pieces. When count over, counter will be auto- reset. 3: Count up by pieces. When count over, motor stops and the counter must be reset by the external switch or the P key on the panel. 4: Count down by pieces. When count over, motor stops and the counter must be reset by the external switch or the P key on the panel.
156	0~9999	0	The output chopping duty cycle of No. 1/2/3/4 solenoid in each bit.
157	0~9999	0	The output chopping duty cycle of No. 5/6/7/8 solenoid in each bit.
158	0~1	0	Counter adjustable: 0:adjustable, 1:not adjustable

161	0 / 1 / 2		Direction of parameter transfer: 0: no action 1: from operation panel to controller 2: from controller to operation panel.
162	1, 2		Restore factory setting
163	1, 2		Save current parameters as user-defined default parameters.
164	-		Password
165	-		Restore the default factory setting, and cover the user defined para setting,.

Note: To keep 160~164 parameters to be effective, you need press key about 3-5 seconds.

3.2 Administrator mode

NO.	Range	Default	Description
200	0 / 1 / 2	0	Trimming mode selection:0: lockstitch machine1: interlock machine: Needle stops at the up position and trim. 2: overlock machine: manual trimming
201	0～359	0	Mechanical angle after trimming
203	5-359	10	Trimming output start angle TS (down needle position angle as the reference point)
204	10-359	120	Trimming output end angle TE (Down needle position angle is the reference and this value should be bigger than TS)
20A	10-60	20	Motor torque improvement coefficient during trimming
211	5-359	25	Thread release output start angle LS (down needle position angle as the reference point)
212	10-359	350	Thread release output end angle LE (Down needle position angle is the reference and this value should be bigger than LS)
213	1-999	1	Thread release output start delay time T1 (ms)
214	1～999	10	Thread release output end delay time T2 (ms) after up needle position
215	0 / 1	1	Wiper function 0: disable 1: enable
216	1～999	10	Wiper output delay time (ms)
217	1～9999	70	Wiper output time (ms)
219	0 / 1	0	Thread clamp function 0: disable 1: enable
21A	10-359	120	Thread clamp start angle
21b	11-359	318	Thread clamp end angle
21E	11-359	160	The angle of presser foot solenoid off during thread clamping
220	200～360	360	Stop position after trimming (motor can stop with a reverse angle)
231	0 / 1	0	Auto test mode: 0: stitches mode 1: time mode
232	0～1000	300	Safe switch filtering time (ms)
234	0 / 1	0	Motor direction: 1: CCW 0: CW
240	0～9999	1000	The ratio between motor and machine (1000 stands for 1:1)
242	0～359	0	Up needle stop angle (After detecting the synchronizer signal)
243	0～359	175	Down needle stop angle
244	0~800	200	Running delay time when presser footer comes down (ms)
247	0～2000	0	The alarm time for adding oil (hours), disabled when setting 0

3.3 Monitor mode

1. Pressing + key.the LCD will display 0240000.
2. Press key to adjust the parameter number, and the para value is shown at the same time.
3. Press key then return to normal sewing mode.

No.	Description	No.	Description
010	Counter for stitches	024	Machine angle
011	Counter for sewing pieces	025	The sampling voltage of pedal
013	State of encoder	026	The ratio between motor and machine
020	DC voltage	027	The total used time(hours) of motor
021	Machine speed	028	The sampling voltage of interaction
022	The phase current	029	Software version
023	Initial electrical angle	030-037	The history record of error codes

3.4 The warning message

Alarm code	Description	Corrective
ALA-1	Fuel filling warning	Fuel filling. Press P key to clear.
ALA-2	Count over for stitches	The counter reaches the limit. Press P key to reset the counter.
ALA-3	Count over for sewing pieces	The counter reaches the limit. Press P key to reset the counter.
ALA-4	Emergency stop	Press the key of emergency stop to clear.
ALA-5	Lift needle locking	Then press the needle lifting locking button, can eliminate the needle lifting locking state
PoWoFF	Power is off	Please wait for 30 seconds, then turn on the power switch
ArM UP	Safety switch alarm	Adjust the machine to the correct position.

3.5 Error mode

If the error code appears, please check the following items first:

1.Make sure the machine has been connected correctly; 2. Reload the factory setting and try again.

Error Code	Description	Solution
Err-01	hardware overcurrent	Turn off the power switch, and restart after 30 seconds. If the controller still does not work, please replace it and inform the manufacturer.
Err-02	software overcurrent	
Err-03	Under-voltage	- Check mains voltage - Stabilize mains voltage
Err-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.
Err-05	over-voltage in operation	
Err-06	Short circuit of solenoid voltage 24V	- Take plug out, if error continues, replace control box - Test inputs/ outputs for 24V short circuit
Err-07	Motor current measuring failure	Turn off the system power, restart after 30 seconds to see if it works well. If such failure happens frequently, seek technical support.
Err-08	sewing motor blocked	- Eliminate sluggish movement in the sewing machine - Replace encoder - Replace sewing motor
Err-09	Brake circuit failure	Check the brake resistor plug on the electric board. Replace the control box
Err-10	Communication failure	Check the connection and if necessary plug in. Replace the control box.
Err-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.
Err-12	Initial motor electrical angle failure	-Try 2 to 3 more times after power down - if it still does not work, please replace the controller and inform the manufacturer.

Err-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.
Err-14	DSP 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.
Err-15	Motor over-speed protection	
Err-16	Motor reversion	
Err-17	HMI Read/Write EEPROM failure	
Err-18	Motor overload	
Err-23	sewing motor blocked Sector error	- Eliminate sluggish movement in the sewing machine - Replace encoder - Replace sewing motor

4 Special Functions

4.1 The adjustment of up needle stop position

1	024 0000	Step 1: Press P+ key, then enter the monitor mode. Parameter 024 is shown, which means the default up needle stop position in angle.
2	024 124	Step 2: Turn the hand wheel and adjust to the right position as up needle stop, and the needle position angle is shown simultaneously.
3	024 0000	Step 3: Press P+ key, the new up needle position is preserved and the parameter is set to zero.

4.2 The recovery of default factory setting

1	024 0000	Step 1: Press P+ key, then enter the monitor mode.
2	- - - - - - -	Step 2: Press key F for about 5 seconds, then Default Factory Setting is recovered displaying as left LCD.
3	8888888	When the LCD is displayed as 8888888, the recovery is accomplished. The machine is recovered back to the initial state in delivery.

4.3 Pedal sensitivity adjustment

Pedal starts moving from the initial position (p.136) where the motor stops, slowing forward to the low speed point (p.137) where the motor run as the minimum speed (p.100), continuing to the accelerated point (p.138) where the motor start to speed up, until the max speed point (p.139) where the motor run up to the maximum speed (p.101). And when the pedal steps back to the foot lifter position (p.135), the presser foot lift. Continuing back to the auto trimming position (p.134), the line is cut. Adjusting the corresponding parameters, user can acquire the proper pedal response to fit the personal habit.

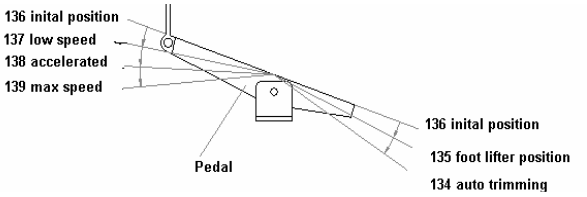


Fig. 4-1 pedal movement of each position parameter