A5 Operation Manual

Safety Instruction

- · **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 engineers are required.**
- · **Please stay away from arc welding equipment, in order to avoid electromagnetic interference and malfunction of the controller.**
- · **Keep room temperature bellow 45°c and above 0°c**
- · **Do not use in humidity below 30% or above 95% or dew and mist places.**
- · **Please turn off the power and unplug the power cord, before install the control box and other components,**
- · **To prevent interference or electric leakage accidents, please make the ground work; the power cord ground wire must be securely connected to earth by an effective way.**
- · **All parts for the repair provided by the Company or approved before use.**
- · **Please turn off the power and unplug the power cord before any maintenance action. There is dangerous high voltage control box, you must turn the power off after one minute before opening the control box.**
- · **The symbol ⚠ in this manual means Safety Precautions, please pay attention to it and strictly follow it, to avoid any unnecessary damage.**

1 Installation Instructions

1.1 Product specifications

Product Type	AHE59	Supply Voltage	AC 220 ±20%V
Power frequency	50Hz/60Hz	Maximum output power	550W

1.2 Interface plug connections

Connecting the plugs of pedaland machine head to the corresponding sockets at the back of controller, as Figure 1-2. Please check and confirm the plug is inserted firmly.
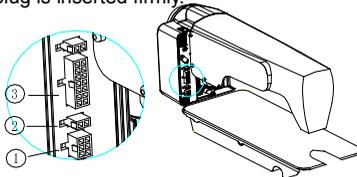

Fig.1-1 Controller Socket Diagram

① Pedal socket; ② Presser Foot lifter solenoid socket ; ③ Solenoid socket;

⚠ : If it is difficult toinserted plug into socket, please check whether them are matching with each other, or the inserting direction or needle insertion direction is correct!

Foot Lifter

1	VDD	+32v
2	Dout	Dout3	OUT 3

Pedal Interface

1	Pedal	Pedal signal
2	GND	5V GND
3	VCC	+5V
4		
5		
6		

Machine Head Solend

1	VDD（+32V)	+32V
2	VDD（+32V)	+32V
3	+5V	+5V
4	GND（+5V)	Sensor Input -
5	GND（+5V)	5V GND
6	VDD（+32V)	+32V
7	VDD（+32V)	+32V
8	JX	Trimming
9	DWQ	RP Input
10	SI	Sensor Input +
11	DIn2	Fill needle SW.
12	Din1	BT SW.
13	DF	Back tack
14	SX	Nipping

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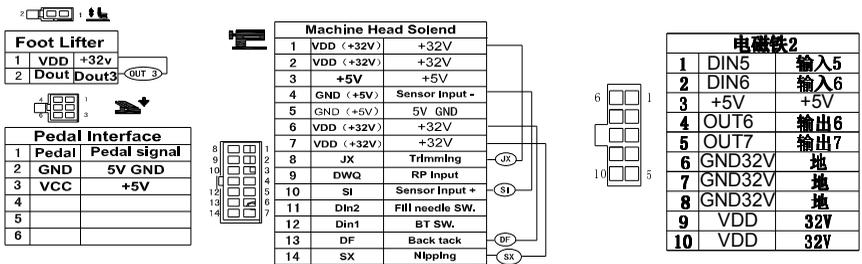| 1	DIN5	输入5
2	DIN6	输入6
3	+5V	+5V
4	OUT6	输出6
5	OUT7	输出7
6	GND32V	地
7	GND32V	地
8	GND32V	地
9	VDD	32V
10	VDD	32V

Fig.1-2 Controller Interface Definition

1.3 Wiring and Grounding

We must prepare the system grounding project, a qualified electrical engineer is requested for the 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

According to the system working state, the LCD module of operation panel will display the current sewing mode, parameters, start / end back tacking, and presser foot, needle position, trimming, soft start sewing etc. Function mark of the operation panel is as follows:
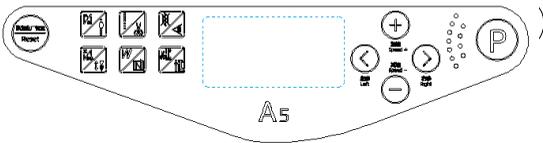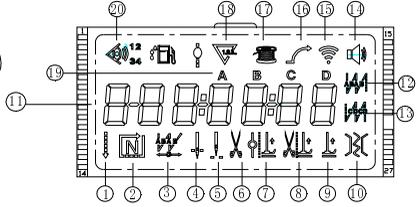

Fig.2-1 Operation Panel

Fig.2-2 Operation Panel LCD display

Index mark Description Index Icon Description

Index	Icon	Description	Index	Icon	Description
①		Free sewing	⑪	88888888	Number/parameter display
②	N	Multi-section constant-stitch sewing	⑫		Start back tacking
③		W bar tacking sewing	⑬		End back tacking
④		Down needle Position	⑭		Voice reminder
⑤		Up needle Position	⑮		One-Shot-Sewing in constant-stitch
⑥		Automatic trimming	⑯		Soft start
⑦		Foot lifting at seam End	⑰		Stitch counter
⑧		Foot lifting after trimming	⑱		Trimming counter
⑨		Presser foot lifting	⑲	A B C D	Sewing segments
⑩	‼	Thread clamp	⑳		Sensor for automatic presser foot lifting

2.2 Key Functions S/L mark Key Name Description

Key	Name	Description
ⓅＰ	Parameter setting key	In the boot state, long press Ⓟkey to enter the parameter modes. After modify the parameters, press Ⓟkey to storage. Then long press Ⓟkey to exit this mode.
🔲	Presser foot key	Under the normal sewing mode, press 🔲 key, switch between cycle sewing midway parking presser foot and sewing after the end of automatic trimming presser foot.
🔲	Start back tacking setting key	Switch during all start tacking type when pressing. (No tacking, single tacking 🔲, double tacking 🔲). The icon of LCD is lit. The number of needle selecting the corresponding keys can be set to A, B segment, default needle number 0~F corresponds to the 0~15 stitch.
🔲	End back tacking Stop position key	Short press 🔲 Key, Switch during all end tacking type when pressing. (No tacking, single tacking 🔲, double tacking 🔲). The icon of LCD is lit. The number of needle selecting the corresponding keys can be set to C, D segment, default needle number 0~F corresponds to the 0~15 stitch. Long press 🔲 Key, Select up/down stop position。
🔲	Thread clamp/ sensor for automatic presser foot lifting key	1, Short press 🔲 key, the icon ⌇ of LCD is lit, the thread clamp function turns on. Then short press 🔲 key, the thread clamp function turns off. 2, Long press 🔲 key, the icon ◁⁰⁚ of LCD is lit, the sensor for automatic presser foot function turns on. Then long press 🔲 key, the sensor for automatic presser foot function turns off.
🔲	Free sewing/trimming key	1, Short press 🔲 key, the free sewing mode is selected. 2, Long press 🔲 key, the icon ✄ of LCD is lit, the automatic trimming function turns on. Then long press 🔲 key, the automatic trimming function turns off.
🔲	W bar tacking / Multi-section constant-stitch sewing	1, Short press 🔲key, the icon 🔲 of LCD is lit, W seam marking function turns on. 2, Long press 🔲key, the icon 🔲 of LCD is lit, the multi-section constant-stitch sewing function turns on.
➕	The parameter increment setting key	Parameter value increment key.
➖	The parameter decrement setting key	Parameter value decrement key.
◁	The left selection key	Parameters selection toward to left key. (In constant-stitch sewing mode, long press this key, One-shot-sewing can be turned on or turned off.)
▷	The right selection key	Prameters selection toward to right key.
0 Reset	factory reset	Insert the hole with the machine needle to touch the switch to restore the factory

3 System parameters setting list

3.1 Parameter mode

1、 In the standby state ,press ⓟkey to enter the parameter modes.

2、 Press corresponding key � ⓢ and key ⊕⊖ to adjust the corresponding parameter.

3、 When the parameter values have increased and decreased, parameter interface flash. Short press ⓟkey to save the modified parameters .Long press ⓟkey to exit parameter interface, return to standby model.

NO.	Range	Default	Description
P99	0~2	1	language selection 0: off, 1: Chinese, 2:English, default language 1 Chinese
P01	200~5000	4000 3500 (Heavy Duty)	the maximum speed of free sewing (the global maximum speed)
P03	0/1	1	Needle stop position selection (0:up; 1: down)
P04	200~3000	1800	Start back tacking speed
P05	200~3000	1800	End back tacking speed
P06	200~3000	1800	Continuous back sewing speed (W sewing)
P07	5~720	300	Clamp start angle when the small nest open
P08	0~360	27	Clamp Angle compensation
P09	0/1	0	Soft start switch (0:off; 1: on)
P0A	100~1200	800	Short trim Speed
P0B	0~20	1	Short trim needle number
P0C	0~359	0	Short trim angle
P15	0~2	0	Mode of adding stitch 0: continuous；1:half stitch；2:one stitch
P16	0~9999	30	Adjust the lift foot response time after the sensor has detected the cloth.
P17	0~99	70	Automatic induction presser foot sensor setting (between the maximum and minimum value of the 02C parameter display)
P18	1~120	35	Stitch balance for start back tacking No.1(Pull in compensation)
P19	1~120	20	Stitch balance for start back tacking No.2(Release of compensation)
P22	0-50	8	Threshold of the backsewing function off.
P24	0~1024	80	Trimming point of pedal
P25	1~120	35	Stitch balance for end back tacking No.1
P26	1~120	20	Stitch balance for end back tacking No.2
P27	0/1/2	1	Presser Foot sensor mode setting: 0: off 1: turn on only after trimming 2: always ON
P30	0~31	0	Feedforward torque of motor: 0: normal functions 1-31: feedforward torque level
P31	10~199	50	Trimming afterburner coefficient (motor afterburner)
P32	1~500	400	Thread clamp solenoid full open time (ms)

P33	0~100	0	Thread clamp solenoid off time per cycle (ms)
P37	0~100	0	Thread clamp solenoid on time per cycle (ms), means the clamp strength.
P45	0~100	1	Back stitch electromagnet per cycle opening time (ms)
P46	0~100	2	Back stitch electromagnet per cycle closing time (ms)
P47	200~360	360	After trimming anti pull (It realizes trimming is pulled back function)
P49	100~500	250	Trimming speed
P50	1~500	150	Presser foot lifting electromagnet full output time ms
P51	0~100	3	Presser foot lifting electromagnet per cycle opening time (ms)
P52	1~800	100	Running delay time when presser footer comes down (ms)
P53	0/1	1	Presser foot lifting function selection 0: off 1: on
P54	0~100	5	Presser foot lifting electromagnet per cycle closing time (ms)
P56	0/1	1	Run to up needle position after Power on： 0: no action 1: action
P57	0~600	100	Presser foot lifting electromagnet protection time 100ms
P60	200~5000	3000	The maximum speed of constant sewing (Automatic test speed)
P62	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) 4: automatic test modle 1 (It has needle stop position of automatic test, running and stopping 5S)
P66	0/2	2	Safety switch function set: 2:on 0:off
P71	0~50	2	Slow release lifter level adjustment, the smaller values and the faster quickly (OC open time)
P76	1~500	60	Back sewing electromagnet full output time ms
P78	1~359	120	Start angle
P79	0~359	320	End angle
PA0	1～9999	5000	The lift foot release down Delay time after remove cloth when sensing turn on.
PA1	0~600	50	The lift foot release down Delay time with cloth when sensing turn on.
PA5	0-2	0	0:All voice 1:Only pow on voice 2:Only key-press voice
PA6	1～100	1	Needle count Proportion-set
PA7	1～9999	1	Needle count Value-set
PA8	0～6	0	Needle count Mode-set 0：OFF； 1：Ascending count, Cycle counting； 2：Descending count, Cycle counting； 3：Ascending count, When the set point is reached, The motor stops running； 4：Descending count, When the set point is reached, The motor stops running；
PA9	1～100	1	Trimming count Proportion-set
PAA	1～9999	1	Trimming count Value-set

PAB	0~4	0	Trimming count Mode-set 0：OFF； 1：Ascending count, Cycle counting； 2：Descending count, Cycle counting； 3：Ascending count, When the set point is reached, The motor stops running； 4：Descending count, When the set point is reached, The motor stops running；

3.2 Monitor mode

No.	Description	No.	Description
010	stitch counter	025	The sampling voltage of pedal
011	Counter for sewing pieces	026	The ratio between motor and machine
012	The head of real speed	027	The total used time(hours) of motor
013	State of encoder	028	The sampling voltage of interaction
020	DC voltage	029	Software version
021	Machine speed	02A	Analog input 1
022	The phase current	02B	Analog input 2
023	Initial electrical angle	02C	Error counter
024	Machine angle	030-037	The history record of error codes

3.3 The warning message

Alarm code	Description	Corrective
ALA-2	Stitch counter alarm	The stitch counter reaches the limit. Press ⓟ key to cancel the alarm and reset the counter.
ALA-3	Trimming counter alarm	The trimming counter reaches the limit. Press ⓟ key to cancel the alarm and reset the counter.
PoHoFF	Power is off alarm	Please wait for 30 seconds, then turn on the power switch
ArN UP	Safety switch alarm	Adjust the machine to the correct position.

3.4 Error mode

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

1.Make sure the machine has been connected correctly;   2. Confirm that the control box match with the

machine head.   3. Confirm factory reset is accurate

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	Disconnect the power to the controller; check the input power supply voltage is low or not (less than 176V). If the power supply voltage is low, please start the controller after recovers the voltage. If the controller still does not work, please inform the manufacturer and replace the controller.

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	Solenoid circuit fault	Turn off the system power. Check carefully, if the solenoid connection is loose or damage, please change it in time. Then restart the system after confirmation, if it still does not work, please inform the manufacturer and replace the controller.
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	Turn off the system power. Check whether the motor power input plug is off, loose or broken, or there is something tangled on the machine head. Please make them correct then restart the system. If it still does not work, please inform the manufacturer and replace the controller.
Err-09	Brake circuit fault	Turn off the system power. Check carefully, if white braking resistor connector on the power board is loose or fall off, please plug it tight then restart the system, if it still does not work, please inform the manufacturer and replace the controller.
Err-10	Communication failure	Check carefully, if the connection between the control panel and controller is off, loose, or broken, please make it correct then restart the system, if it still does not work, please inform the manufacturer and replace the controller.
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	Motor blocked encoder failure	Turn off the system power. Check whether the motor power input plug is off, loose or broken, or there is something tangled on the machine head. Please make them correct then restart the system. If it still does not work, please inform the manufacturer and replace the controller.

4 Pedal sensitivity adjustment

Pedal movement starts from the initial position (p.136) where the motor stops, slowly stepped forward to the low speed point (p.137) where the motor runs at the minimum speed (p.100), proceeding to the accelerated point (p.138) where the motor start fasten, 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 automatic presser foot lifting. Continuing back to the auto trimming position (p.134), thread trimming is completed automatic. The parameter value is set for an assurance (No. 134 parameters) < (No. 135 parameter) <(No. 136 parameters) <(No. 137 parameters) <(No. 138 parameters) <(No. 139 parameters). Adjusting the corresponding parameters, user can acquire the proper pedal response to fit the personal habit.
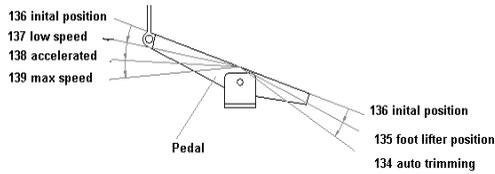

Fig. 4-1 pedal movement of each position parameter

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