Roller AC Servo System

HMI-15 User Manual

Safely 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 personnel are required.
- Please try to stay away from arc welding equipment, in order to avoid electromagnetic interference and malfunction of the controller.
- Keep in room bellow 45℃and above 0℃.
- Do not humidity below 30% or above 95% or dew and mist of places.
- Install the control box and other components, turn off the power and unplug the power cord.
- To prevent interference or leakage accidents, please do the ground work, the power cord ground wire must be securely connected to an effective way to earth.
- All parts for the repair provided by the Company or approved before use.
- Performing any maintenance action, you must turn off the power and unplug the power cord. There are dangerous high voltage control box, you must turn the power off after one minute before opening the control box.
- This manual marked with the symbol of the Department of Safety Precautions must be aware of and strictly adhered to, so as not to cause unnecessary damage.

1 Installation Instructions

1.1 Product specifications

Product Type	ASE59	Supply Voltage	AC 220 ± 44 V
Power frequency	50Hz/60Hz	Maximum output power	750W

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.

① Foot lifter solenoid socket; ② Machine head solenoid socket;

③ Lifter needle lock socket; ④Pedals socket;

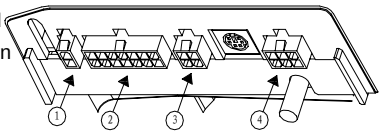
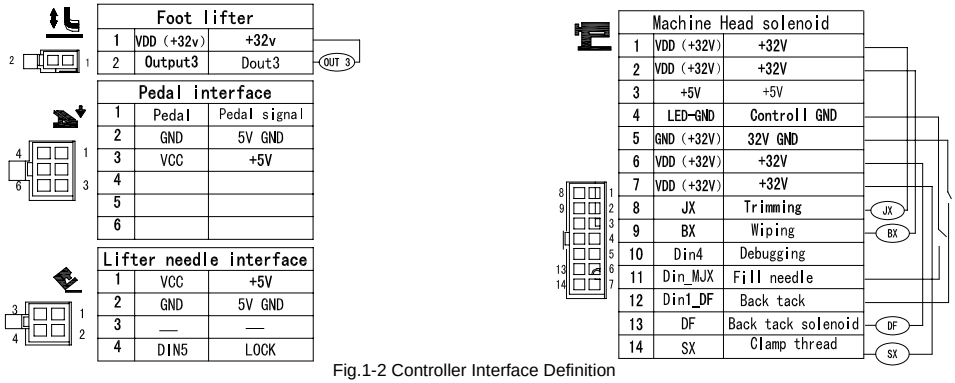


Fig.1-1 Controller Socket Diagram

⚠: 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!



Foot lifter

1	VDD (+32v)	+32v
2	Output3	Dout3

Pedal interface

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

Lifter needle interface

1	VCC	+5V
2	GND	5V GND
3	—	—
4	DIN5	LOCK

Machine Head solenoid

1	VDD (+32V)	+32V
2	VDD (+32V)	+32V
3	+5V	+5V
4	LED-GND	Controll GND
5	GND (+32V)	32V GND
6	VDD (+32V)	+32V
7	VDD (+32V)	+32V
8	JX	Trimming
9	BX	Wiping
10	Din4	Debugging
11	Din_MJX	Fill needle
12	Din1_DF	Back tack
13	DF	Back tack solenoid
14	SX	Clamp thread

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

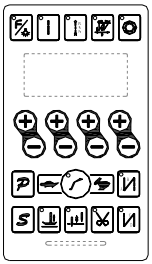


Fig.2-1H-15 Operation Panel

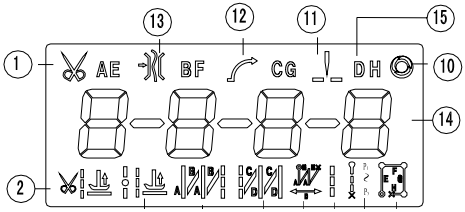


Fig.2-2 LCD Display

Index	Icon	Description	Index	Icon	Description
①		Automatic trimming	⑨		four-constant-stitch sewing
②		Presser foot lifting after trimming	⑩		One-shot sewing
③		Presser foot lifting at seam end	⑪		Position up
④		Start back tacking	⑫		Soft start
⑤		End back tacking	⑬		Thread clamp
⑥		W sewing	⑭	8888	Number display
⑦		Free sewing	⑮	AE BF CG DH	Sewing segments index
⑧		Multi-section constant-stitch sewing			

2.2 Key Functions

Key	Name	Description
P	**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.
S	**modification setting key**	Parameter to modify the confirmation key, press the S again to return to the standby interface.
W	**W sewing**	The system enter to W sewing mode when press the W key is lit. Show A B D 4 4 4 is w sewing interface,default range 1~F corresponds to the 1~15 pin.

Key	Name	Description
	**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.
	**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.
	**Multi-section constant-stitch sewing**	Also known as fixed length seam, press this key, the system is to enter a multi section seam work mode. The LCD screen is lit and displayed on the n X yy, where X is the current segment, the maximum 15 segment can be set, YY is the current number of pins, the maximum 99 pin can be set. If the current number of X is set to 00, the total number of valid segments is (X-1).
	**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).
	**Trimming cycle selection**	Enable or disable the trimming cycle.
	**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.
	**Stop position key**	When sewing midway stop, system upper / lower needle stop position by pressing the key, is lit, that is up needle stop position, then press the key, show down needle stop. the sewing complete trimming, the system will stop up needle position. Note: the H-43 panel without the key, the key + combination to achieve the function.
	**Custom function key**	Special function according to the custom requirement.
	**Increasing and decreasing motor speed**	The maximum motor speed can be adjusted using the keys.
	**Up and down keys**	Adjust the values in plus and minus state.
	**Soft start setting key**	Soft start at the first seam is enabled (icon on) or disabled.

3 System Parameters Setting List

3.1 Parameter table Mode

NO.	Range	Default	Description
1、Long press P key , the digital tube display P100;			
2、Press S key to display the value of the current parameter			
3、Press the corresponding ⊕key and⊖key to change the parameter value or selection parameter number, Press S key to save;			
4、At last press S key to exit parameter setting mode,return to sewing work mode.			
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
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
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.
138	0~1024	580	Accelerated point of pedal
139	0~1024	962	Max speed point of pedal
			Figure 4-1 shows the specific setting method
13A	0~800	100	The running delay time of footer lifting
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
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.
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
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
216	11-359	318	Thread clamp end angle
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

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	Oil refill time alarm (hour. 0: function deactivated)
248	0～4000	0	Oil alarm, stop operation time (hour. 0: function deactivated)
274	1～500	70	No.2 electromagnet fully output time ms
275	1～ 100	1	No.2 electromagnet chopping on time ms(Reserved)
276	1～ 100	1	No.2 electromagnet chopping off time ms(Reserved)
278	1～500	150	No.3 electromagnet fully output time ms
279	1～ 100	1	No.3 electromagnet chopping on time ms(Reserved)
27A	1～ 100	1	No.3 electromagnet chopping off time ms(Reserved)

3.3 Monitor mode

1. Pressing P+ ✕ key to enter monitor mode.
2. Press ⊕and⊖key to adjust the parameter number, press S key and the para value is shown at the same time.
3. Press S 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

3.3 The Warning Message

Alarm code	Description	Corrective
A-1	Fuel filling warning	Fuel filling. Press P key to clear.
A-2	Count over for stitches	The counter reaches the limit. Press P key to reset the counter.
A-3	Count over for sewing pieces	The counter reaches the limit. Press P key to reset the counter.
A-4	Emergency stop	Press the key of emergency stop to clear.
A-5	Lift needle locking	Then press the needle lifting locking button, can eliminate the needle lifting locking state.
oFF	Power is off	Please wait for 30 seconds, then turn on the power switch.
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. Reload the factory setting and try again.

Error Code	Description	Solution
Er-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.
Er-02	Software overcurrent	
Er-03	Under-voltage	- Check mains voltage - Stabilize mains voltage
Er-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.
Er-05	Over-voltage in operation	
Er-06	Short circuit of solenoid voltage 24V	- Take plug out, if error continues, replace control box - Test inputs/ outputs for 24V short circuit
Er-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.
Er-08	Sewing motor blocked	- Eliminate sluggish movement in the sewing machine - Replace encoder - Replace sewing motor
Er-09	Brake circuit failure	Check the brake resistor plug on the electric board. Replace the control box
Er-10	Communication failure	Check the connection and if necessary plug in. Replace the control box.
Er-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.
Er-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.
Er-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.
Er-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.
Er-15	Motor over-speed protection	
Er-16	Motor reversion	
Er-17	HMI Read/Write EEPROM failure	
Er-18	Motor overload	
Er-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	P024 0000	The control system in the restoration of the factory, can be reset up needle stop position. Step 1: Press P+ ✕ key, then Press S ,enter the monitor mode. Parameter 024 is shown, which means the default up needle stop position in angle(0°).
2	0124	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	0000	Step 3: Long press P+i key, the new up needle position is preserved and the parameter is set to zero.Press S key to exit.

4.2 The Recovery of Default Factory Setting

1	P024	Step 1: Press P+ ✕ key, then press S enter the monitor mode.
2	----	Step 2: Press key S for about 5 seconds, then Default Factory Setting is recovered displaying as left LCD.
3	8888	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.

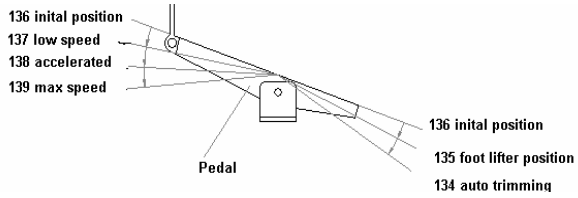


Fig. 4-1 pedal movement of each position parameter

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