

ZB-A2S Electric control manual (V1.0)

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 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 Product installation

1.1 Product specifications

Model	A2S	voltage	AC 220±20% V
Frequency	50Hz/60Hz	Max output power	550W

1.2 Plug connection

Connecting plugs of the the pedal or machine head to the related socket on the control box. More details please check the below map 1-1.

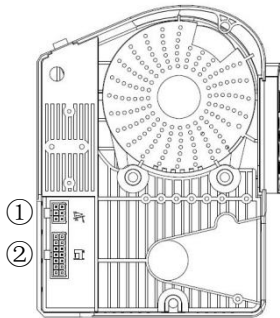


Figure 1-1 A2 series control box

1	GND	The GND of +5V
2	-	-
3	VCC	+5V
4	RX	UART communication receive
5	TX	UART communication transmit
6	Pedal	Analog signal of pedal

1	EM-JX	Cut thread electromagnet
2	EM-QX	Clip thread electromagnet
3	EM-TVJ	Presser foot electromagnet
4	GND (+5V)	Machine head light GND
5	DF	Back sewing button
6	EM-DF	Back sewing electromagnet
7	BZ	Adding stitch button
8	VDD	+30V
9	VDD	+30V
10	VDD	+30V
11	+5V	Machine head light +5V
12	GND (+30V)	The GND of +30V
13	VDD	+30V
14	GND (+30V)	The GND of +30V

1-2 Controller interface definition

①pedal & upgrade socket; ②Electromagnet and Machine head button socket.

Note: please check if the plug and socket match or the direction of the plug is right when we can't plug in under normal condition.

1.3 Wiring and grounding

Please make qualified grounding system with professional technicians. Make sure the AC plug is grounded safely before power on. The yellow and green wire is for grounding, and please make sure it is grounded before operating thus can prevent abnormal conditions.

- Note: please don't twist or press while grounding power wire, signal wire, grounding wire etc for making sure safety

2 Operation panel instructions

2.1 Operation panel display instructions

- According to the system working state, The Digital pipe of the operation panel will display the current sewing status Contains (stop needle position, thread trimming indicaton). The operation panel looks as follows.



2-1 operation panel

2.2 The description of each key function

Nu.	picture	diagram	Function description
1		Enter the parameter area function key	Parameter function entry key
2		Parameter view save key	View and save the selected parameter number
3		Speed plus	Initial standby speed plus
4		Speed reduction	Initial standby speed reduction
5		Left key	1、 adding 2、 adding
6		Right shift key	1、 reducing 2、 reducing
7		Display cutover key	Toggles the window display and needle setting for the ABCD segment or EFGH segment
8		Front safety switch	Reinforcement sewing part(A-B) one time or two times Before switching
9		Back safety switch	Reinforcement sewing part(C-D) one time or two times Before switching
10		W stitch / multi-section stitch	Short press to select W sewing mode / long press to select multi-segment sewing mode
11		Restore factory settings key	Press and hold 3S to restore the factory settings
12		Free stitch/ cut thread	Short press to select free stitch mode /long press to turn on the thread trimming function or off it
13		Stop needle position selection/clip thread	Switch on/off the tension post function when pressing the top/down needle position shortly

3 Parameters adjustments

3.1 Method to enter into operators parameters and saving

- Press for a long time and then press shortly then enters into parameters. Press or to modify related parameters. If not modified, press to back ; if modified successfully, press then shows ok and back to the main menu. Press to exit the parameters mode.

3.2 Method to enter into technicians parameters and saving

- Press + for a long time and power on, same method as operators parameter.

3.3 Speed adjustment

- Press or to change the speed. 50 difference once a time and can press constantly.

3.4 Factory setting

- Press for factory setting.

3.5 Method to monitors mode

- Press and shows monitors number , press or to change the monitors number , press to enters into the related value of monitors number, press again to return the monitors reference number.(if the monitor number is 24、 25、 26、 28, press shortly when shows the related value then can back to the monitors number , press to save the current monitors' value and if shows ok, it means saved successfully. Press shortly and exit the monitors mode.)
- Note:** how to set needle position, enters parameter 24 and adjust hand wheel to change the needle position, then press check the value, then press for a long time (needle position will change accordingly), press to exit monitors mode.

3.6 Parameters

3.6.1 Operators parameter

Nu.	descriptions	Factory value	range	Nu.	descriptions	Factory value	range
P00	Starting speed (r/min)	200	100-800	P23	Curve mode of the pedal 0 : straight line 1 : two phase slope 2 : curve (square) 3 : S curve	0	0-3
P01	Highest speed (r/min)	3500	200-5000	P24	Thread trimmer position of the pedal	150	0-4095
P02	Multi-phase speed (r/min)	3000	200-3500	P25	Back safty stitch(sucking)	27	1-120
P03	Needle position 0 : top 1 : down	1	0-1	P26	Front safty stitch(releasing)	18	1-120
P04	Front bar tack sewing speed (r/min)	1800	200-3000	P29	Auxiliary parameters 0 : aquare 1: cube	1	0-1
P05	Back bar tack sewing speed(r/min)	1800	200-3000	P30	Powerful when the motor under low speed 0 : normal 1—31 more powerful	0	0-31
P06	W sewing speed(r/min)	1800	200-3000	P31	Thread trimmer strength	40	10-60
P07	Slow starting sewing speed(r/min)	800	100-800	P32	Tread tension magnet time(from beginning to full energy)	40	1-200
P08	Slow starting sewing stitches	1	1-9	P33	Tread tension magnet period (from beginning to full energy)	6	1-10
P09	Slow starting sewing switch 0 : off 1 : on	1	0-1	P34	Multi-phase mode 0:off 1:on	0	0-1

P10	W sewing stitch (sucking)	27	1-120	P35	Thread tension switch	1	0-1
P11	W sewing stich (releasing)	18	1-120	P36	Angle of finishing testing the top thread	25	1-360
P12	Half stitch delaying time(ms)	150	1-180	P37	Closing time of tension post period	4	1-10
P13	One stitch delaying time(ms)	180	150-250	P38	Thread trimer 0: off 1: on	1	0-1
P14	Adding stitch sewing speed(r/min)	200	100-500	P39	Presser foot switch during sewing 0: off 1: on	0	0-1
P15	Adding stitch type 0 : by time 1 : half stitch 2 : one stitch	0	0-2	P40	Presser foot switch after trimming 0:off 1:on	0	0-1
P18	Front safty sewing stitch	27	1 - 120	P41	Stitch number	1	1-50
P19	Back safty sewing stitch	18	1 - 120	P42	Stitch number calculation	9999	1-9999
P21	Manual back sewing speed (r/min)	5000	200-5000	P43	Stitch counting number 0 : off 1 : up 2 : down 3 : alarm and stop when arrive the highest point 4 : alarm and stop when arrive the lowest point 5 : alarm and run when arrive the highest point 6 : alarm and run when arrive the lowest point	0	0-6
P22	Value of back sewing fuction when adding stitch	8	0-9999				

3.6.2 Technicians parameters

Nu.	Descriptions	Factory -value	Range	Nu.	Descriptions	Factory -value	range
P44	Delaying time when touching the front pedal 0 : off 1-300 : on	0	0-300	P68	Maximum speed setting (r/min)	3700	200-5000
P45	Working time of presser foot every period(ms)	1	1-10	P69	Stich quantityby testing the top thread	5	0-100
P46	Closing time of presser foot every period (ms)	2	1-10	P70	Presser foot position setting	800	0-4095
P47	Reverse pulling after trimming	360	200-360	P71	Slowly presser foot	125	100-150
P48	Back sewing magnet protection time (s)	10	1-60	P72	Initial position when pressing the pedal	400	0-4095
P49	Trimming time(r/min)	250	100-500	P73	Ending position of pedal under low speed	700	0-4095
P50	Duration of presser foot magnet to the power fullest (ms)	150	100-500	P74	Maximum value of pedal	4000	0-4095
P51	Working time of presser foot magnet every period (ms)	3	1-10	P75	Mid position of pedal	1650	0-4095
P52	Presser foot delaying time (ms)	200	100-500	P76	Back sewing magnet from starting to the fullest time (ms)	60	1-200
P53	Automatic presser foot function 0 : manual 1 : automatic	0	0-1	P77	Motor direction 0 : opposite 1 : converse	0	0-1
P54	Closing time of presser foot every period(ms)	5	1-10	P78	Tension post starting angle	150	10-359
P55	Top thread testing switch	0	0-1	P79	Tension post finishing angle	280	0-359
P56	Automatic top needle position 0 : manual 1 : automatic	1	0-1	P80	Trimmer starting angle	0	0-359
P57	Presser foot magnet protection time(s)	10	1-30	P81	Trimmer enforcement angle	100	0-359
P58	Top needle position angle	67	0-359	P82	Angle of after trimming	160	0-359
P59	Down needle position angle	176	0-359	P83	Confirmation time of presser foot pedal(ms)	50	1-500
P60	Testing speed(r/min)	3000	200-5000	P84	Confirmation time of safety switch alarm(ms)	300	1-500
P61	Aging operation time(s)	3	1-255	P85	Restoring time of safety sitch alarm(ms)	50	1-200
P62	Special test mode 0: normal 1:simple sewing 2:initial angle test 3:automatic testing mode	0	0-3	P86	Transition point speed between two phase slope(r/min)	1500	0-4000
P63	Aging stopping time(s)	2	1-255	P87	Analog quantity between two phase slope	2700	0-4095
P64	Retain	0	0-1	P88	Piece number unit	1	1-50
P65	Factory setting 0: no operation 1:factory value 2:technicians value	0	0-2	P89	Piece number calculation	9999	1-9999
P66	Machine head safety switch test	1	0-1	P90	Piece counting number 0 : off 1 : up 2 : down 3 : alarm and stop when arrive the highest point 4 : alarm and stop when arrive the lowest point 5 : alarm and run when arrive the highest point 6 : alarm and run when arrive the lowest point	0	0-6
P67	Logic of machine head protection switch	1	0-1				

3.6.3 Monitors parameters

Number	Descriptions	Number	Descriptions	Number	Descriptions
010	Stitch number	020	Voltage	025	Max value of front pedal
011	Piece number	021	speed	026	Value for mid pedal
012	Number of stitches per sewing	022	Phase current	028	Thread trimmer speed of the pedal
013	Panel version number	023	Initial angle	030-037	History errors
018	Controller version number	024	Mechanical angle		

4 Error code

4.1 Error code table

If the system shows error or alarm, please first check the following items:

1. first, confirm if the machine's connection cable is intact; 2. Confirm whether the electronic control box and the machine is matched or not; 3. Confirm whether the factory reset is accurate or not.

Error code	Code meaning	Countermeasure
Err-01	Hardware over current	Turn off the system power, re-connect the power after 30 seconds, if the controller still can not work, replace the controller and notify the factory.
Err-02	Software over current	
Err-03	System under voltage	Disconnect the controller power and check if the input supply voltage is low (under 110V). If the supply voltage is low, restart the controller after the voltage has returned to normal. If the voltage is still normal, start the controller still can not work properly, please replace the controller and notify the factory.
Err-04	Excessive shutdown	Disconnect the controller power and check that the input supply voltage is high (above 275V). If the supply voltage is high, restart the controller after the voltage has returned to normal. If the voltage is still normal, if restart the controller still can not work properly, please replace the controller and notify the factory.
Err-05	Running over voltage	
Err-07	Current detection circuit failure	Turn off the system power, re-connected after 30 seconds to observe whether the normal work. Retry several times, if the fault occurs frequently, replace the controller and inform the manufacturer.
Err-08	Motor stalled	Disconnect the power of the controller, check whether the motor power input plug is off, loose, broken, whether there is foreign body wrapped around the machine head. After resetting the system still does not work, replace the controller and inform the factory.
Err-09	Brake circuit failure	Turn off the system power, check the power board of white brake resistor connector is loose or fall off, put it tight and restart the system. If it still does not work, replace the controller and inform the manufacturer.
Err-10	HMI communication failure	Check whether the connection between the control panel and the controller is off, loosening, breaking, and restarting the system after returning to normal. If it still does not work, replace the controller and inform the manufacturer.
Err-12	Motor initial angle detection fault	Please try restart 2-3 times, if still reported failure, please replace the controller and notify the factory.
Err-13	Motor optical encoder signal missing	Turn off the system power, check the motor sensor connector is loose or off, to return to normal after the restart system. If it still does not work, replace the controller and inform the manufacturer.
Err-14	EEPROM Motherboard read and write EEPROM fault	Turn off the system power, restart the system after 30 seconds, if still can not work, please replace the controller and notify the factory.
Err-14	EEPROM Motherboard read and write EEPROM fault	
Err-15	Motor over speed protection	
Err-16	Motor reversal	
Err-18	Motor overload	

4.2 Safety alarm table

Error code	Code meaning	Solutions
ALR-2	Stitch number alarm	Means the number of pins has reached the set limit. Press P key to cancel the alarm and count again.
ALR-3	Package number alarm	Means the number of packages has reached the set limit. Press P key to cancel the alarm and count again.
A-UP	Flip switch alarm	Put the machine to ensure that the flip switch to restore

5 Foot pedal sensitivity adjustment

- 1) The pedal movement starts from the initial position ① (parameter 75), slowly stepping forward to ② (72 + 75 parameter) to start the low-speed sewing, and then proceed to step (75 + 73) to start accelerating Deep step to ④ (74 parameters) to achieve the highest speed. Between ② ③ segment to maintain the starting speed, between ③ ④ segment is the no-level speed control process;
- 2) When the foot pedal starts from the initial position ① (parameter 75) and slowly rises to ⑤ (parameter 70), the foot lifter is lifted automatically. When the foot pedal starts from the initial position ① (parameter 75) Slowly after the step to ⑥ (24 parameters) automatically cut the line when the finished the cutting action;
- 3) Make sure the value should be arranged as below: (parameter No. 24) < (parameter No. 70) < (parameter 75) < (parameter 75 + 72) < (parameter 75 + 73) < (parameter 74)
- 4) It can be monitored by the mode of 025,026,028 parameters in real time to monitor the pedal analog maximum, pedal back to the voltage sampling value, pedal trimming voltage sampling value, the operation mode with the stop position on the set, different positions of the pedal. The sampling value is used as the reference value for each parameter. If the machine is too sensitive, touch the pedal machine to start running, may be appropriate (if the machine is too sensitive, it is appropriate to reduce the 72 parameters (not less than the return position parameter 75), you can improve the sensitivity of the previous step; Increase the 72 parameters; if not easy to fill the needle, a little pre-step, the speed of the rapid increase caused by forward needle, may be appropriate to increase the 73 parameters or reduce the 72 parameters (that is, increase the pedal low speed range), can also be Reduce the initial seam speed (parameter 00) appropriate.

