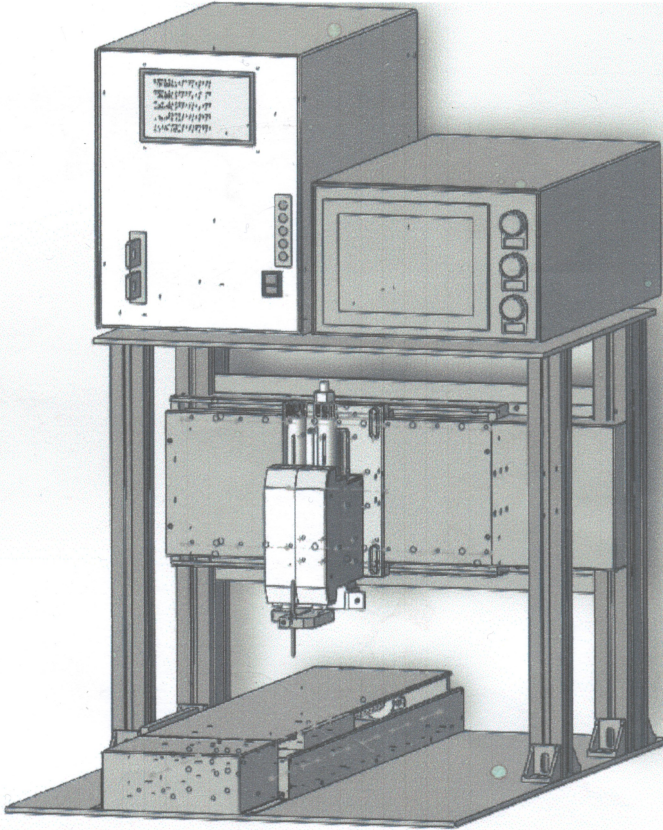


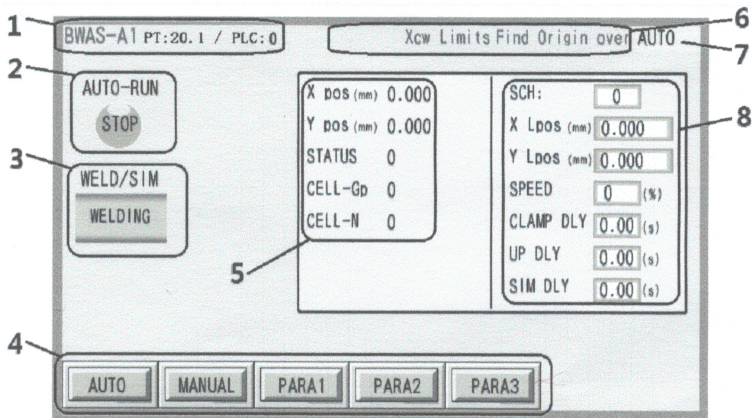
Automatic Battery Packs Welding Machine Manual



Machine Name: SHBA-42A Auto Battery Packs Welding Machine
Manufacturer Name: Dongguan Will-Best Intelligent Equipment Co., Ltd.

X: 0~244.5mm; Y:0~446.5

1. 【Automatic】Interface



(1) Machine model and program version number

(2) 【Auto-Run】Indicator: "Stop" is displayed in standby mode and "run" is displayed in welding mode

(3) 【Run/simulation】Button: switch button of "welding operation" mode or "simulation operation" mode.

"welding operation" mode: normal operation mode of the machine.

"simulation operation" mode: all actions of the machine are consistent with "welding operation" mode, but the welding power is not started during the whole process.

(4) Interface switch button column

- a. 【Auto】Button: It is used to switch to the automatic interface.
- b. 【Manual】Button: It is used to switch to the 【Manual 1】 interface.
- c. 【Parameting 1】Button: It is used to switch to the 【Parameting 1】 interface.
- d. 【Parameting 2】Button: It is used to switch to the 【Parameting 2】 interface.
- e. 【Parameting 3】Button: It is used to switch to the 【Parameting 3】 interface.

(5) Operation parameter display column

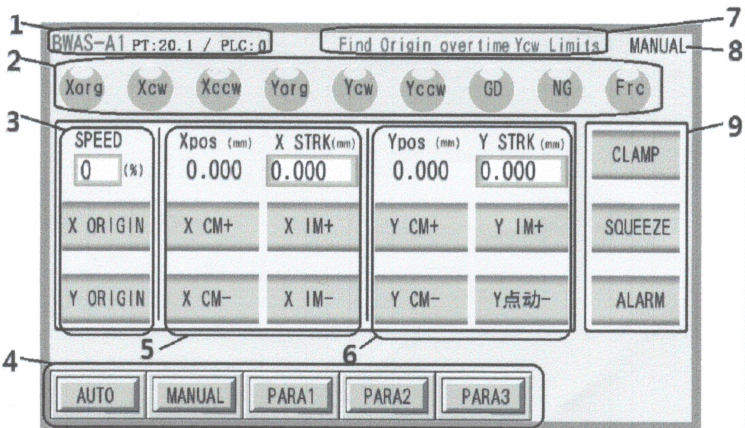
- a. 【X position】Displays the current position of the X drag board.
- b. 【Y position】Displays the current position of the Y drag board.
- c. 【Auto status】Displays the running status of the current program.
- d. 【Cell group number】Display the cell group number of current welding.
- e. 【Cell number】Display the cell number under the current welding cell group.

(6) Alarm information display column

- a. 【Xcw Limits】The right limit of the X drag board.
- b. 【Xccw Limits】The left limit of the X drag board.
- c. 【Ycw Limits】The forward limit of the Y drag board.

- d. 【Yccw Limits】 The back limit of the Y- drag board.
 - e. 【Welding overtime】 The weld head is pressed down to the welding completion time of more than 10 seconds.
 - f. 【find origin overtime】 X,Y drag board takes more than 30 seconds to find the origin.
 - g. 【Origin to loading and unloading position overtime】 X,Y drag board runs from origin to loading and unloading position for more than 30 seconds.
 - h. 【Return to loading and unloading position overtime】 It takes more than 30 seconds from the end of the soldering point to the time to return to the loading and unloading position.
 - i. 【Shift overtime】 It takes more than 20 seconds to move from one solder joint to the next.
- (7) Auto interface label
- (8) Operation parameter setting column
- a. 【Program number】 Select working program (0 ~ 7, 8 parameter programs in total).
 - b. 【X loading and unloading】 Set the position of the X- drag board when loading and unloading the battery, the accuracy 0.001mm.
 - c. 【Y loading and unloading】 Set the position of the Y- drag board when loading and unloading the battery, the accuracy 0.001mm.
 - d. 【Running speed】 Set the running speed of X Y drag board and set the range (1% ~ 100%).
 - e. 【Positioning delay】 Set the action time of positioning and clamping cylinder, and the set range is 0 ~ 2.00 seconds.
 - f. 【Up delay】 Set the up delay time of welding head cylinder, and the set range is 0 ~ 2.00 seconds.
- * This delay prevents the XY drag board from starting to move when the welding head is not lifted, causing the battery fixture to collide with the welding electrodes.
- g. 【simulate delay】 Set the pause time of each solder joint during simulation operation, and set the range of 0 ~ 2.00 seconds.

2. 【Manual 1】 Interface



- (1) Machine model and program version number
- (2) Indicator column
 - a. **【Xorg】** Indicator: X drag board reaches the origin position indicator.
 - b. **【Xcw】** Indicator: X drag board reaches the right limit indicator.
 - c. **【Xccw】** Indicator: X drag board reaches the left limit indicator.
 - d. **【Yorg】** Indicator: Y drag board reaches the origin position indicator.
 - e. **【Ycw】** Indicator: Y drag board reaches the forward limit indicator.
 - f. **【Yccw】** Indicator: Y drag board reaches the back limit indicator.
 - g. **【GD】** Indicator: Solder joint qualified indicator.
 - h. **【NG】** Indicator: Solder joint NOT qualified indicator.
 - i. **【Frc】** Indicator: The welding pressure reaches the indicator.
- (3) X, Y drag board control column
 - a. **【Moving speed】** : Set the manual running speed of X, y drag board, and the set range is 1%~100%.
 - b. **【X Back to zero】** Button: Start the X drag board to return to the origin.
 - c. **【Y Back to zero】** Button: Start the Y drag board to return to the origin.
- (4) Interface switch button column
 - a. **【Auto】** Button: It is used to switch to the automatic interface.
 - b. **【Manual】** Button: It is used to switch to the **【Manual 1】** interface.
 - c. **【Parameting 1】** Button: It is used to switch to the **【Parameting 1】** interface.
 - d. **【Parameting 2】** Button: It is used to s to switch to the **【Parameting 2】** interface.
 - e. **【Parameting 3】** Button: It is used to s to switch to the **【Parameting 3】** interface.
- (5) X drag board Manual control column
 - a. **【X postion】** Displays the current position of the X drag board, the accuracy 0.001mm.
 - b. **【X stroke】** Set the inching stroke of X drag board, and set the range 0-999.999mm.
 - c. **【X continuous move +】** Button: Drive x drag board forward continuously.
 - d. **【X continuous move -】** Button: Drive x drag board back continuously.
 - e. **【X inching move +】** Button: Drive x drag board forward [x stroke] setted distance.
 - f. **【X inching move -】** Button: Drive x drag board back [x stroke] setted distance.
- (6) Y drag board Manual control column
 - a. **【Y postion】** Displays the current position of the Y drag board, the accuracy 0.001mm.
 - b. **【Y stroke】** Set the inching stroke of Y drag board, and set the range 0-999.999mm.
 - c. **【Y continuous move +】** Button: Drive Y drag board forward continuously.
 - d. **【Y continuous move -】** Button: Drive Y drag board back continuously.
 - e. **【Y inching move +】** Button: Drive x drag board forward [Y stroke] setted distance.
 - f. **【Y inching move -】** Button: Drive x drag board back [Y stroke] setted distance.
- (7) Alarm information display column
 - a. **【Xcw Limits】** The right limit of the X drag board.
 - b. **【Xccw Limits】** The left limit of the X drag board.
 - c. **【Ycw Limits】** The forward limit of the Y drag board.
 - d. **【Yccw Limits】** The back limit of the Y- drag board.
 - e. **【Welding overtime】** The weld head is pressed down to the welding completion time of more than 10 seconds.
 - f. **【find origin overtime】** X,Y drag board takes more than 30 seconds to find the origin.

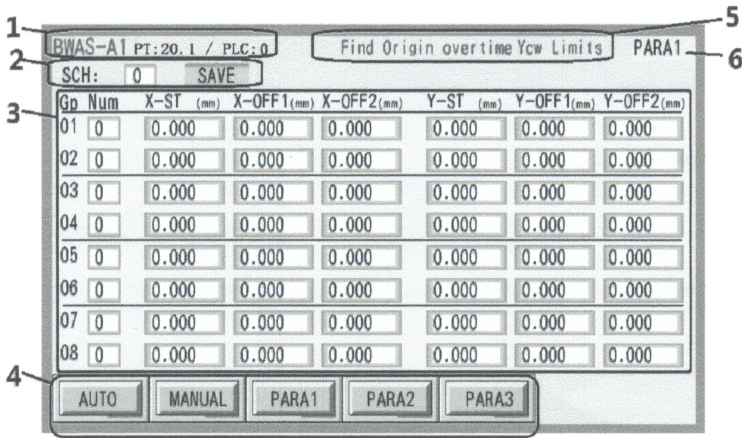
- g. 【Origin to loading and unloading position overtime】X,Y drag board runs from origin to loading and unloading position for more than 30 seconds.
- h. 【Return to loading and unloading position overtime】It takes more than 30 seconds from the end of the soldering point to the time to return to the loading and unloading position.
- i. 【Shift overtime】 It takes more than 20 seconds to move from one solder joint to the next.

(8) Manual 1 interface label

(9) Output device button column

- a. 【Clamp】 Button: Drive positioning clamping cylinder action.
- b. 【Welding heads】 Button: Drive the head cylinder action.
- c. 【Alarm】 Button: Drive the buzzer action.

3. 【Parameter 1】 Interface



(1) Machine model and program version number

(2) Program selection and saving

a. 【Program number】 Select the setting work program, set the range 0 ~ 7, 8 parameter programs in total

b. 【Save】 Button: Save the set parameters.

(3) Program parameter setting

*Each battery pack corresponds to a program, and each program has 20 groups of parameters; each group of parameters corresponds to a regular cell row.

a. 【Group】 There are 1-20 cell row parameters.

b. 【Number】 Set the number of cells in each group, set the range 0 ~99.

* If it is set to 0, the machine will stop running when it reaches this set of parameters.

c. 【X starting point】 Set the X position of the first cell in this group, set the range 0~999.999mm.

d. 【X offset 1】 Set the X distance between the two cells in the group, set the range -99.999~+99.999mm.

* When the parameter is (+), the x-axis moves forward; when the parameter is (-), the x-axis

moves backward.

e. **【X offset 2】**Set the X distance between two welds on a cell, set the range -20.000~+20.000mm.

* If a cell is welded only once, the value set to 0.

* When the parameter is (+), the x-axis moves forward; when the parameter is (-), the x-axis moves backward.

f. **【Y starting point】** Set the Y position of the first cell in this group, set the range 0~999.999mm.

g. **【Y offset 1】** Set the X distance between the two cells in the group, set the range -99.999~+99.999mm.

* When the parameter is (+), the Y-axis moves forward; when the parameter is (-), the Y-axis moves backward.

h. **【Y offset 2】**Set the Y distance between two welds on a cell, set the range -20.000~+20.000mm.

* If a cell is welded only once, the value set to 0.

* When the parameter is (+), the y-axis moves forward; when the parameter is (-), the Y-axis moves backward.

(4) Interface switch button column

a. **【Auto】** Button: It is used to switch to the automatic interface.

b. **【Manual】** Button: It is used to switch to the **【Manual 1】** interface.

c. **【Parameting 1】** Button: It is used to switch to the **【Parameting 1】** interface.

d. **【Parameting 2】** Button: It is used to s to switch to the **【Parameting 2】** interface.

e. **【Parameting 3】** Button: It is used to s to switch to the **【Parameting 3】** interface.

(7) Alarm information display column

a. **【Xcw Limits】** The right limit of the X drag board.

b. **【Xccw Limits】** The left limit of the X drag board.

c. **【Ycw Limits】** The forward limit of the Y drag board.

d. **【Yccw Limits】** The back limit of the Y- drag board.

e. **【Welding overtime】**The weld head is pressed down to the welding completion time of more than 10 seconds.

f. **【find origin overtime】** X,Y drag board takes more than 30 seconds to find the origin.

g. **【Origin to loading and unloading position overtime】**X,Y drag board runs from origin to loading and unloading position for more than 30 seconds.

h. **【Return to loading and unloading position overtime】**It takes more than 30 seconds from the end of the soldering point to the time to return to the loading and unloading position.

i. **【Shift overtime】** It takes more than 20 seconds to move from one solder joint to the next.

(6) Parameter 1 interface label

4. **【Parameter 2】** Interface

1 RWAS-A1 PT:20.1 / PLC:0 3 Find Origin overtime Ycw Limits PARA2 5
 2 SCH: 0 SAVE 6

Gp Num	X-ST (mm)	X-OFF1(mm)	X-OFF2(mm)	Y-ST (mm)	Y-OFF1(mm)	Y-OFF2(mm)
09	0	0.000	0.000	0.000	0.000	0.000
10	0	0.000	0.000	0.000	0.000	0.000
11	0	0.000	0.000	0.000	0.000	0.000
12	0	0.000	0.000	0.000	0.000	0.000
13	0	0.000	0.000	0.000	0.000	0.000
14	0	0.000	0.000	0.000	0.000	0.000
15	0	0.000	0.000	0.000	0.000	0.000
16	0	0.000	0.000	0.000	0.000	0.000

4 AUTO MANUAL PARA1 PARA2 PARA3

* Refer to 【Parameter 1】 Interface

5. 【Parameter 3】 Interface

1 RWAS-A1 PT:20.1 / PLC:0 2 Ycw Limits Xcw Limits Find Or PARA3 5
 2 SCH: 0 SAVE 6

Gp Num	X-ST (mm)	X-OFF1(mm)	X-OFF2(mm)	Y-ST (mm)	Y-OFF1(mm)	Y-OFF2(mm)
17	0	0.000	0.000	0.000	0.000	0.000
18	0	0.000	0.000	0.000	0.000	0.000
19	0	0.000	0.000	0.000	0.000	0.000
20	0	0.000	0.000	0.000	0.000	0.000

4 AUTO MANUAL PARA1 PARA2 PARA3

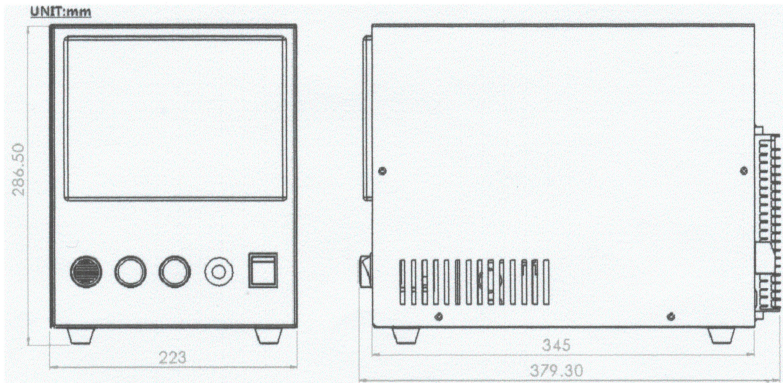
* Refer to 【Parameter 1】 Interface

BWAS-A1 Manual of electric control box

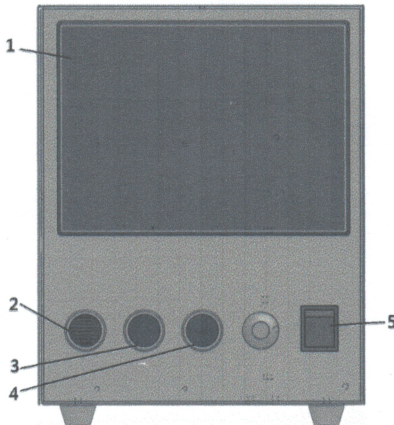
1. Description of the function

The electric control box is used to control the movement of the X and Y axes and the movement of the welding machine.

2. Dimension



3. Front panel



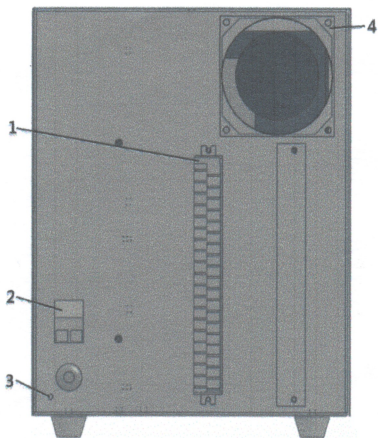
- (1) Touch screen:used to set the operating parameters of BWAS-A1 and the monitoring of the operation process.

* Refer to the BWAS-A1 Touch Screen Manual for details

- (2) Buzzer: Alarm

- (3) Reset button: Press this button, the machine will return to the state when it was started.
- (4) Start button: Press the key to start automatic welding once.
- (5) Power switch: For powering on and off 220vac.

4. Rear panel



(1) N1 Wiring block

The pin description is as follows:

Pin	Name	Fuction
1	XA	Connect the A line of the X-axis motor
2	/XA	Connect the /A line of the X-axis motor
3	XB	Connect the B line of the X-axis motor
4	/XB	Connect the /B line of the X-axis motor
5	24V+	io dc power supply (24Vdc) Positive
6	24V-	io dc power supply (24Vdc) negative
7	0.06	Connect the origin sensor of x-axis
8	0.00	Connect the CW limit sensor of x-axis
9	0.01	Connect the CCW limit sensor of x-axis
10	NOP	
11	YA	Connect the A line of the Y-axis motor
12	/YA	Connect the /A line of the Y-axis motor
13	YB	Connect the B line of the Y-axis motor
14	/YB	Connect the /B line of the Y-axis motor
15	24V+	io dc power supply (24Vdc) Positive
16	24V-	io dc power supply (24Vdc) negative
17	0.07	Connect the origin sensor of Y-axis
18	0.02	Connect the CW limit sensor of Y-axis
19	0.03	Connect the CCW limit sensor of x-axis
20	NOP	

21	24V+	io dc power supply (24Vdc) positive
22	100. 4	Connect the solenoid valve of the positioning cylinder
23	100. 5	Connect the solenoid valve of the welding head cylinder
24	24V-	io dc power supply (24Vdc) negative
25	0. 08	preserved function
26	24V-	io dc power supply (24Vdc) negative
27	0. 09	Connect the external start button
28	24V-	io dc power supply (24Vdc) negative
29	0. 04	Connect the 【GD】 output signal of welding power source
30	0. 05	Connect the 【NG】 output signal of welding power source

4. 1

- (2) Power wiring block: connect to 220 VAC power supply
- (3) Ground screw: connect the ground wire
- (4) Cooling fan