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BM110   3.3KW
Manual for Quick Installation of Auto Focus Cutting Head + BC

BM111S SERIES 3.3KW Auto-Focusing Laser Cutting Head BC User Manual

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One.   BM111S with Bertrand System-Position Ring

Step 1: Electrical wiring

- Driver + stepper motor:

  The motor is a hybrid stepping motor, which needs to be connected to 24V, 0V and earth, a +, a –, respectively, at the VDC, GND and PE of the driver

  B + and B – are the power lines of the stepping motor. Please connect them according to the line mark. (24V power supply shall be provided by the customer)
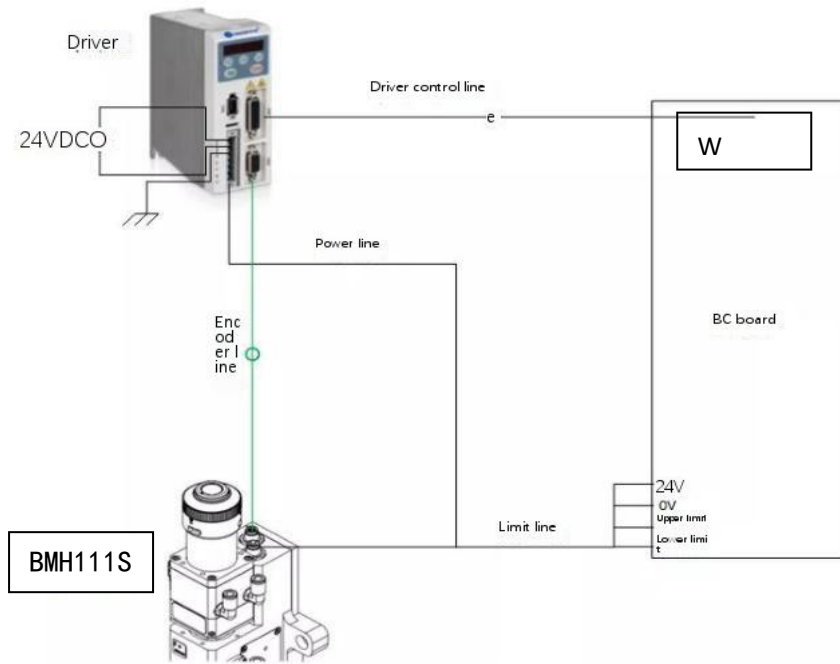
- Limit signal:

white	gules	Pink	blue
+24V	OV	Upper limit	Lower limit

Note: the limit sensor is a low-level effective, normally closed signal, and continuously outputs 0V signal when it is not triggered. See Figure 4-1 for the schematic diagram of limit.

Suggestion: Connect all four limit wires to the board, and do not transfer them to avoid voltage difference caused by external power supply.

Thunderplug driver

interface defines

Terminal number	Symbol	Name	Explain
the motor and power input ports:			
1	Vde	24V	External 24V power supply
2	GND	0V	
3	PE	PE	External Earth
4	A+	A phase motor winding +	A + (brown)
5	A-	A phase motor winding-	A- (green)

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Step 2: Software settings

1. After opening the Platform Configuration Tool, enter the values shown in the following figure:
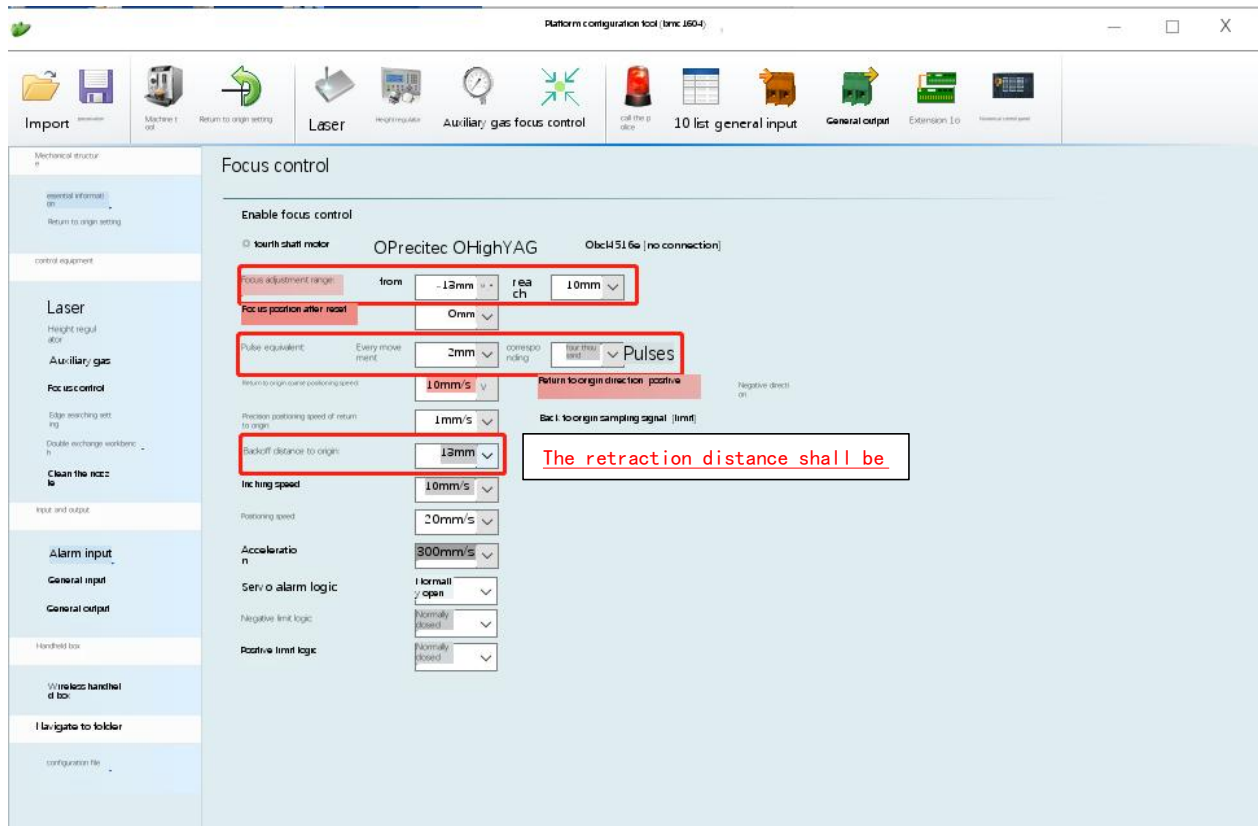
Step 3: Interface operation

1. Confirm that the wiring is correct. After power-on, the driver L 0

2. Click "+" or "−" on the interface to trigger the positive-negative limit, and confirm that the direction and limit signals are normal.

3. Jog to control the focus scale to return to the vicinity of the 0 scale, click the zeroing icon, and the focusing axis moves in the negative direction. After touching the negative limit, the second zeroing is automatically and slowly performed. At this time, the zero position of the software coincides with the zero focus position on the cutting head. If it does not coincide, modify it appropriately (return to the original point and retreat distance), and the zeroing is completed.

Important tips:

1) Click−, the lens barrel moves downward, and jog until it reaches the negative limit (the same is true for the positive direction). The zeroing operation can be carried out only after the limit is confirmed to be effective. Otherwise, it may cause mechanical seizure.

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2) Return to the negative direction of the origin, and take the negative limit as the sampling signal.

3) A pitch of 2 mm corresponds to a turn of 4000 pulses.

4) The positioning speed is recommended to be 20-30mm/s

5) Acceleration setting 300mm/s ²

4. Save parameters and enter the interface
   + -5 fixed focus is set on the test software respectively,
Observe whether the focus scales of the cutting head correspond to each other.

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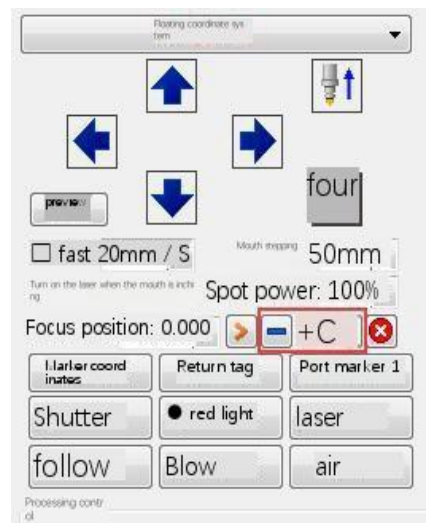
Step 4: Servo part

1. Control line definition

Bochu DB 15-pin			Razor drive	
A+	3		20	EA+
A-	11		21	EA-
B+	4		22	EB+
B-	12		23	EB-
Z+	5		24	Z+
Z-	13		25	Z-
PUL+	1		3	PUL+
PUL-	9		4	PUL-
DIR+	2		5	DIR+
DIR-	10		6	DIR-
24V	8			Spare
SON	6		1	ENA+
0V	7		9/18/26	SGND
ALM	14		12	ALM+
0V	15		2/13	ENA-/ALM-
Shielding layer			Enclosure	

Note: If the control line is changed, the shielding wire must be used, and the shielding layer and the shell must be grounded to avoid interference!

2. Drive parameters

BMH109 driver parameter table

Comparison of common parameters of H2-506		
Parameter number	Set the value	Functional description
PR07	4000	Pulse number corresponding to 2mm
PR08	8000	The resolution of the encoder
PR15	1	
PR16	1	
PR19	1	Direction of rotation of the motor
PR29	1	Open-loop/closed-loop selection, 0/1
PR59	20	Overvoltage value

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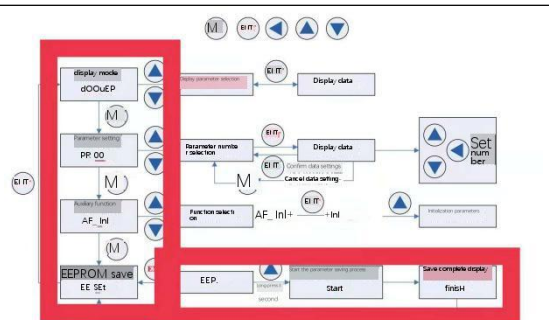| PR66	10	Rigidity
PR67	100	Inertia ratio

The above parameters can be used as a reference when encountering problems.

Leisai Drive Common Faults

Fault phenomenon 1: The fourth axis servo alarms, but the driver does not alarm.

Fault cause treatment method

① Parameter 16 is the fault output resistance state ② The parameter of using Bochu board is 1. ③ Use Jiaqiang system or F100 to control to 0	 **The following is a video tutorial** WeChat_202106 28103532.mp4
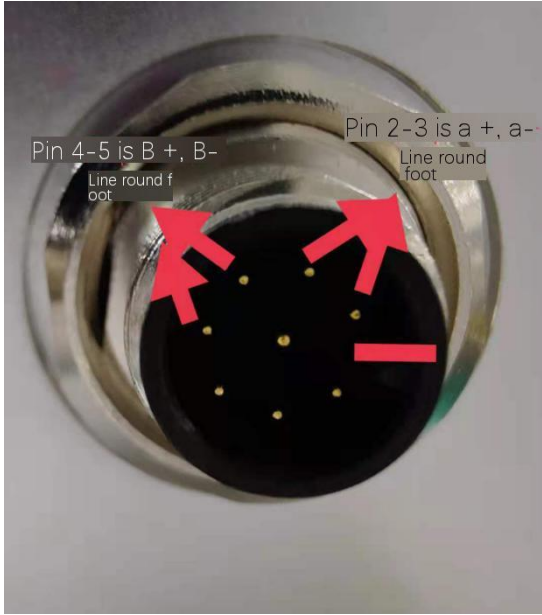
Fault phenomenon 2: Er020 alarm

Fault cause treatment method

The motor is mechanically stuck at the limit	Power off the driver, and manually turn the focus to the middle position to return to zero.

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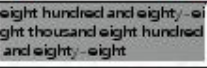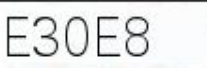|	
The coarse positioning speed of returning to zero is too fast.	Reduce the speed of returning to zero
Motor or line fault	1. Check for proper A +-, B +- wiring 2. Power off and measure whether the resistance values of A +-and B +-at the driver end are balanced. If not, measure the port of the cutting head. 3. Measure the resistance value of the cutting head port If the measured resistance values are similar, the motor is normal. Check whether the circuit is broken. If there is a large difference in the resistance value, the cutting head motor has been burned out.
No response from the limit switch, resulting in unsuccessful zero return	1. Check whether the power supply to the driver is 24 V and the power supply to the limit causes the limit to be unresponsive. Power the driver separately. 2. Observe that the W +-lamp of the board is not at the limit position and always outputs 0 V. It can be manually turned to the limit position to observe whether the lamp is off and whether the software alarm is normal. 3. If the W-limit switch is broken, it can be set to return to zero in the positive direction in the platform configuration.
Encoder line is worn out	4. Check the trunking encoder line

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Fault phenomenon 3: focus of cutting head cannot be controlled

Fault cause treatment method

④ Operate the JOG manually to observe whether the motor operates.	⑤ Step 1: Press the [ENT] button once, and d00uEP will be displayed on the screen; ⑥ Step 2: Press the [M] button once, and PR _ 00 will be displayed on the screen; ⑦ Step 3: press the up key [▲], and the number of PR _ 00 is added until PR _ 28; ⑧ Step 4: When the PR _ 28 parameter number is displayed on the screen, press the [ENT] button to display the number "0" on the screen; ⑨ Step 5: Press the up key [▲] once to change the number "0" on the display screen to the number "1"; ⑩ Step 6: Press the [ENT] button once, and observe that the lens barrel of the cutting head will move back and forth for about 2mm; ⑪ Video operation is as follows: WeChat_202106 28112655.mp4 ⑫ ⑬ If not, check the motor or driver
⑭ If the manual JOG runs normally, check whether the material number of the control line is correct and whether the platform configuration parameters are correct.	⑮ Bochu open-loop material No.: ELNAB102M00045 ⑯ Platform configuration parameters

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Step 5: Alarm processing

    1. The servo initially displays the interface when the motor is powered on

Display L 0 means that the difference between the given pulse and

LED display	meaning	remark s
(display)	data-low	
eight hundred and eighty-eight thousand eight hundred and eighty-eight	data-high	
E30E8	position error	Difference between given pulse and feedback pulse

    the feedback pulse is 0

When the driver controls the motor to move;

1. If the motor moves normally, the value will change in real time according to the position of the motor, and the value will be 0 after the motor is stable; It indicates that the wiring is normal and the server is working normally.

2. If this value remains at 0 and the motor does not move; It indicates that the server has not received the given pulse, and it is necessary to check whether the contact of the control line is good;

3. If this value keeps increasing or decreasing and the motor does not move; It indicates that the servo receives the given pulse, but does not receive the feedback pulse (from the motor). It is necessary to check whether the power line and the encoder are in good contact, or whether the motor is pushed to the upper and lower limits, which causes the motor to be unable to move;

4. When the value increases to 6000 or decreases to -6000, the server will generate an out-of-tolerance protection fault, and the interface displays Er _ 020. When the drive fails, the drive will stop and the corresponding fault code will

be prompted. The user needs to power off and power on again before the fault can be cleared. The driver displays ERR20, and confirm that the parameter setting is correct. If it cannot be cleared after restarting, please contact our technicians.

5. The software has no alarm, the driver always displays L0, the inching software displays the focus change, but the focus scale of the cutting head has no change, check:

A. Focus parameter setting

B. Check control line material number, drive parameters PR07 = 4000 and PR08 = 8000

C. Check the PCI slot, clean it again, plug and unplug it, and check for poor contact

D. Whether to use 4516E and other expansion cards, and directly use the W axis port to test

E. Automatic JOG movement 2mm using driver PR028 parameter

6. The limit position is abnormally stuck:

1. On the software, change the large acceleration of 5000 and the inching speed of 200 in the platform configuration interface, reverse the inching focus (before inching, it must be ensured that there is no alarm in the driver and there is no soft limit alarm in the software), and change the parameters back to the normal value after leaving the stuck position.

2. Remove the screw as shown in the figure with an Allen wrench, insert the Allen into the bayonet at the top of the screw rod, and turn the focus position to the middle of the screw rod stroke (as shown in Figure 6).

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