Labotronics

Digital Electric Overhead Stirrer

LB-310HS

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1. Introduction

Digital electric overhead stirrer LB-31OHS is a digital electric overhead stirrer with a stirring capacity of 50 mL to 50 L. It has timer range of 0 min to 9999 mins and features a brushless DC motor along with a motor torque of 450 N.m.

2. Features

1. LCD display
2. Speed control with closed MCU control
3. Max timer set: 9999 mins
4. Stainless steel stir rod material

3. Specifications

Model No.	LB-31OHS
Stirring capacity	50 ml~50 L
Motor power	100 W
Motor torque	450 N.m
Timer range	0 min~999 mins
Rotational speed range	60 rpm~1500 rpm, 60 rpm~2000 rpm
Stir rod length	350 mm
Holder length	700 mm
Voltage	220 V ± 10%, or 110 V ± 10%
Chuck clamping range	Ø 1.5~10 mm
Product dimension	390 x 93 x 160 mm
Weight	12.1 Kgs

4. Applications

Used for mixing and stirring processes in various studies of biological sciences.

5. Instrument Introduction

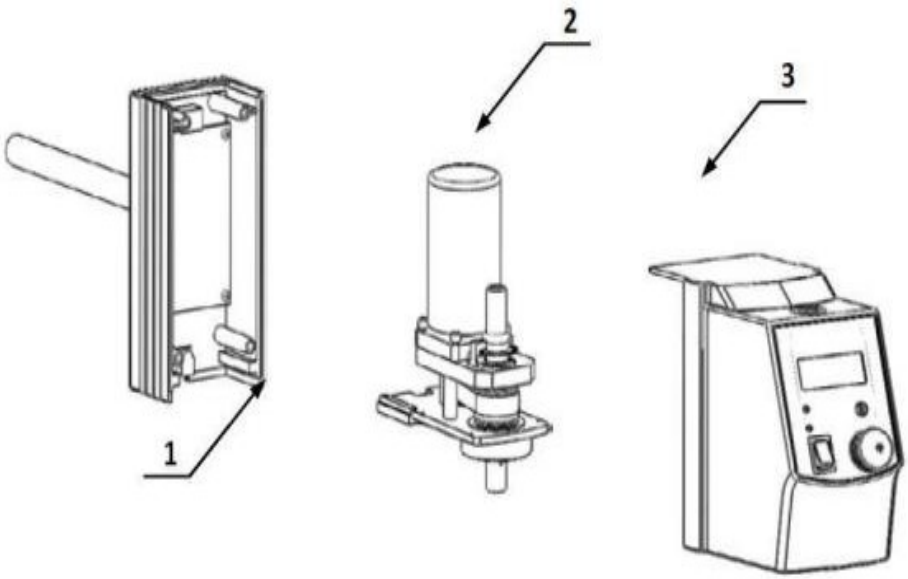

Figure-1

1) Production Module
2) Function Module
3) Control Module

- The Control Module is composed of the front panel, film, speed/timer knob, power switch, rubber cap, LCD, and command button.
- The Production Module is composed of the back plate, driver circuit, power socket, and RS232 interface.
- The Function Module is composed of the motor, encoder, spindle, belt pulley, bearing, transmission belt, photoelectrical switch, and base plate.
- **Stirring:** The motor drives the belt pulley to rotate, and further drives the stirring paddle to rotate and mix the sample.
- **Speed feedback:** It implements speed feedback control with the Hall effect of the brushless motor.
- **LCD:** It is connected to the driver circuit to show the running status and user settings.

6. Installation

If the instrument does not work, analyze the cause first. Replace/ repair the failed components if the failure is due to a hardware problem. Follow the instructions below to disassemble the instrument and replace components.

1) **Disassembly Tool:** Cross screwdriver, M2.5 socket wrench, M3 socket wrench

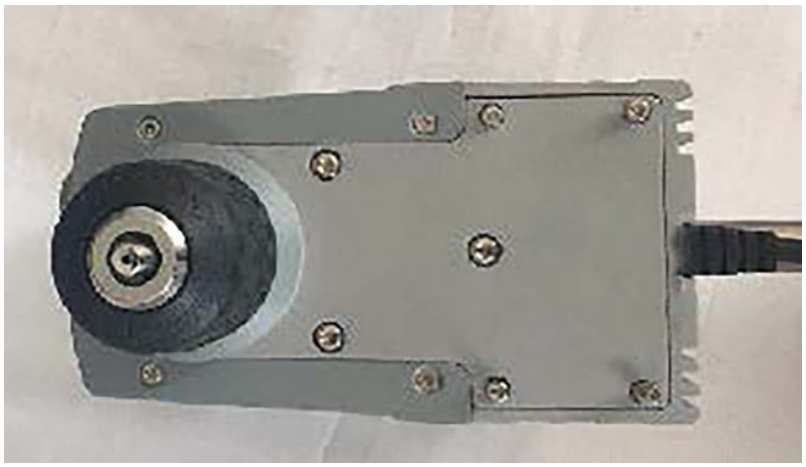

Figure-2

Step 1:

- Turn the stirrer head upside down.
- Remove the four screws marked with red circles and put them away.

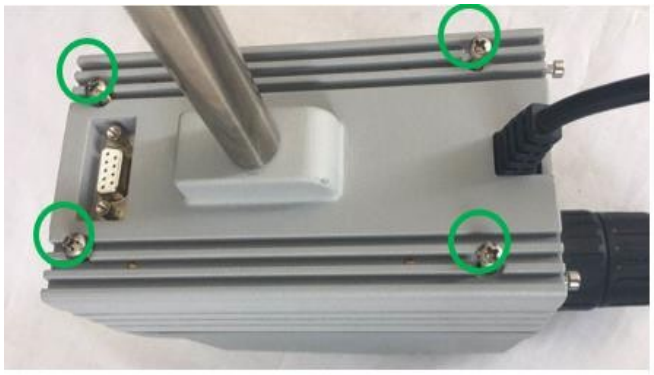

Figure-3

- Remove the four screws marked with green circles at the rear of the instrument and put them away.

Step 2:

- Take the control module off from the rest of the instrument.
- Remove the flat cable and power cable respectively.

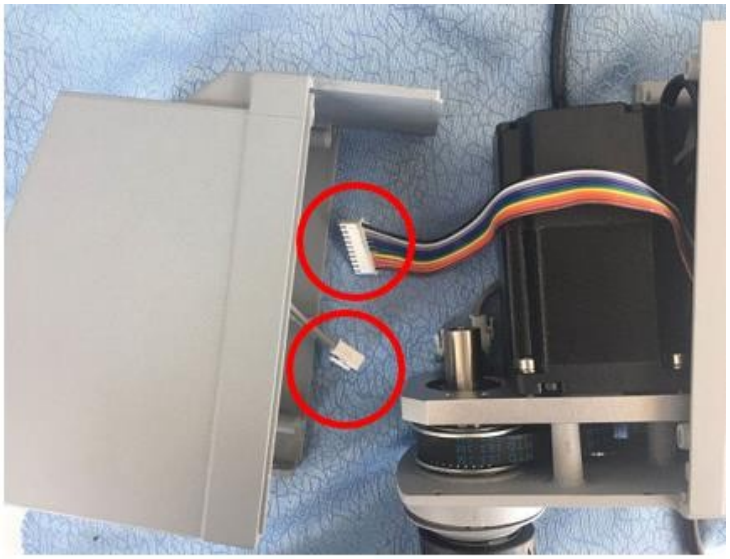

Figure-4

Step 3:

Remove the four screws marked with red circles with the M2.5 socket wrench and put them away.

Figure-5

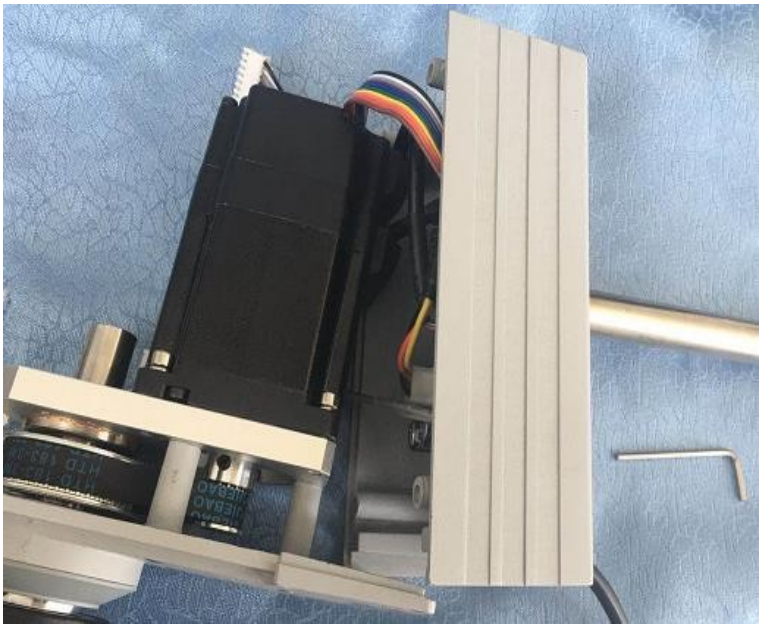

Figure-6

Step 4:
Take the function module off from the rest of the instrument.

2) Description of key components

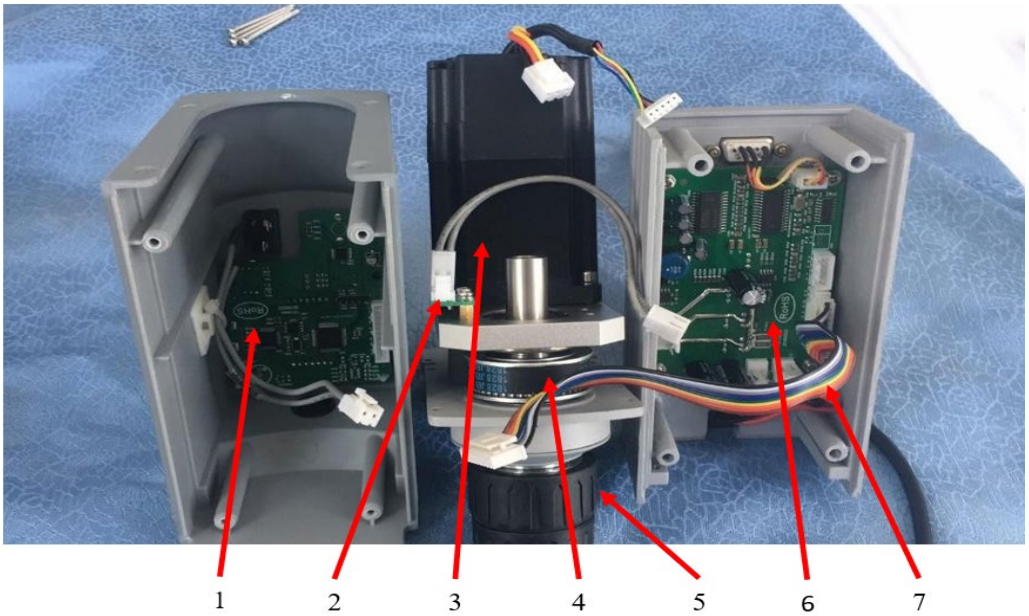

Figure-7

No.	Component
1.	Main circuits
2.	Adapter
3.	Motor
4.	Transmission belt

3) Cable layout and Connections

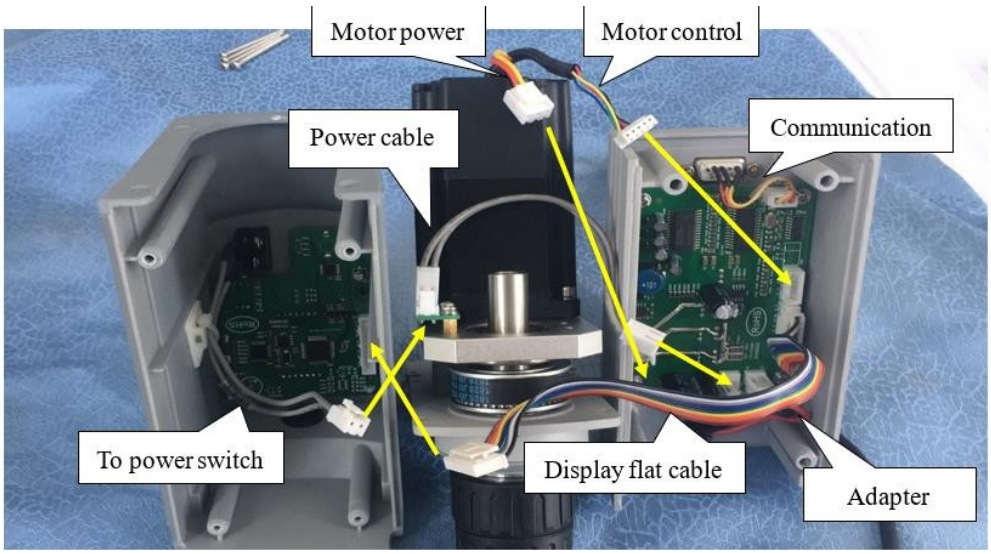

Figure-8

4) Replace the main circuits

Step 1:

- Follow the instructions to disassemble the instrument.
- Disconnect cables from the main circuits, including flat cables and power switch cables.

Step2:

- Remove the thumb wheel of the knob.
- Then remove the locking nut with an M10 socket wrench.

Step 3:
Squeeze the clamps on the circuit board marked with red circles with a pair of pliers and remove the main circuit.

Step 4:
- Replace the main circuit with a new one.
- Put it back in reverse order.

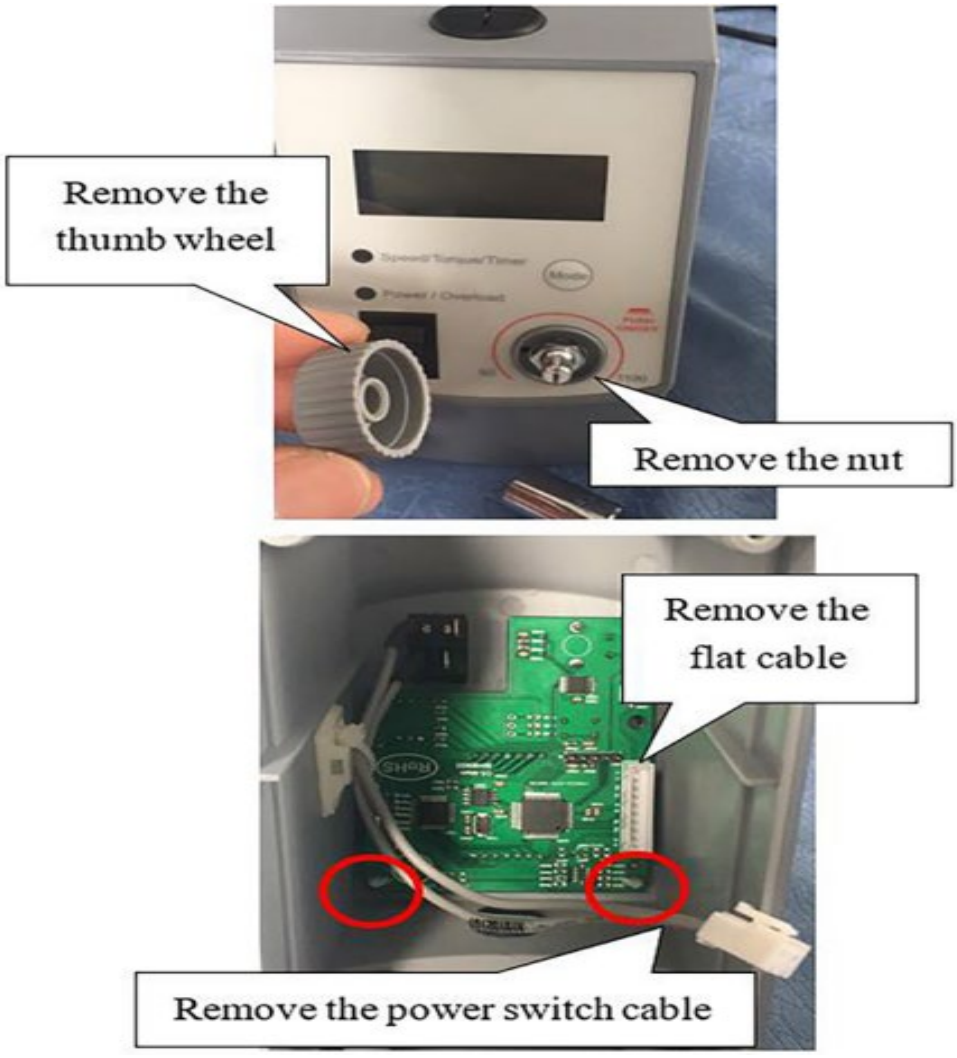

Figure-9

7. Working Principle

Figure-10

- Mix the sample in the container with stirring paddles on the overhead stirrer. Increase the power to mix highly viscous samples.
- The figure shows the major interfaces of the overhead stirrer.
- On the control panel there is LCD, mode button, speed/timer control knob, speed/torque/timer indicator, power/overload protection indicator, and power switch.
- On the rear of the instrument, there is an RS232 interface and power socket.
- Connect the power cable and switch the power ON.
- Users can set the experimental conditions using the button and knob on the control panel.
- **knob:** Rotate the knob to continuously adjust the parameter.
- Press the knob to confirm the current settings and start running.

8. Troubleshooting

Error Code /Description	Possible Causes	Solutions
The LCD display is off.	No power.	• Check the power. • Connect to the power and try again.
	Powered off.	Switch on the power.
	Power connection failure.	Disassemble the instrument and check all the cable connections.
No stirring	• The target speed is not set. • Power connection failure. • Transmission belt failure. • Driver circuit failure. • Photoelectrical sensor failure.	• Rotate the knob to set the target speed. • Press it to start stirring. • Make sure all the connections are secured. • Replace the belt. • Replace the driver circuit. • Replace the photoelectric sensor
E03/The motor engages in protection mode.	The motor is stalled.	• Power off the instrument. • Remove the substance that causes the malfunction. • Set target speed and start running.
Inaccurate speed control.	Drill chuck failure.	Reconnect the drill chuck.
	Photoelectrical sensor failure.	Replace the sensor.

9. Accessories

Optional Accessories

Accessory No	Accessories	
A1	Stir rod	400 x Φ7 mm
		Stainless steel
		Diameter 60 mm
		3pcs paddles
A2	Stir rod	400 x Φ7 mm
		PTFE coated stir rod
		Maximum diameter 60 mm
		Minimum diameter 25 mm
A3	Stir rod	400 x Φ7 mm
		Stainless steel
		Diameter for span 60 mm
A4	Stir rod	400 x Φ7 mm
		Stainless steel
		Diameter for paddle 60 mm

10. Replacement

1) Replace the driver circuit

Step 1:

- Follow the installation instructions for the instrument.
- Disconnect cables from the main circuits, including communication, motor power, motor control, power, adapter, and flat cable.
- Follow the instructions to check the cable connection layout.

Step 2:

- Remove the four screws marked with red circles with a cross screwdriver.
- Remove the driver circuit.
- Replace it with a new one.
- Put it back in reverse order.

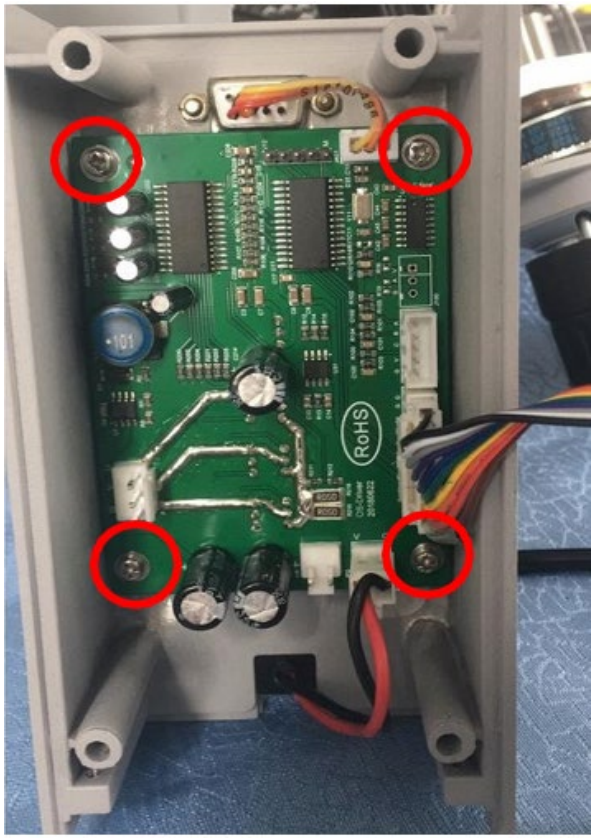

Figure-11

2) Replace the function module

Step 1:

- Follow installation and separate the function module from the protection module.
- Disconnect cables from the main circuits, including motor power, motor control, power, and switch cable.

Step 2:

- Replace the function module with a new one.
- Put it back in reverse order.

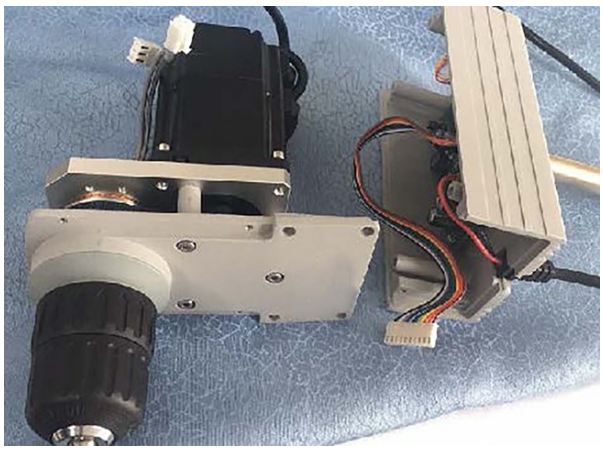

Figure-12