

# Service Manual

Centrifuge HX

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*VERSION020220421*

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## Chapter I Introduction

Centrifuge HX is applied for the separation of sample mixture in clinical laboratories



Figure 1 Front View

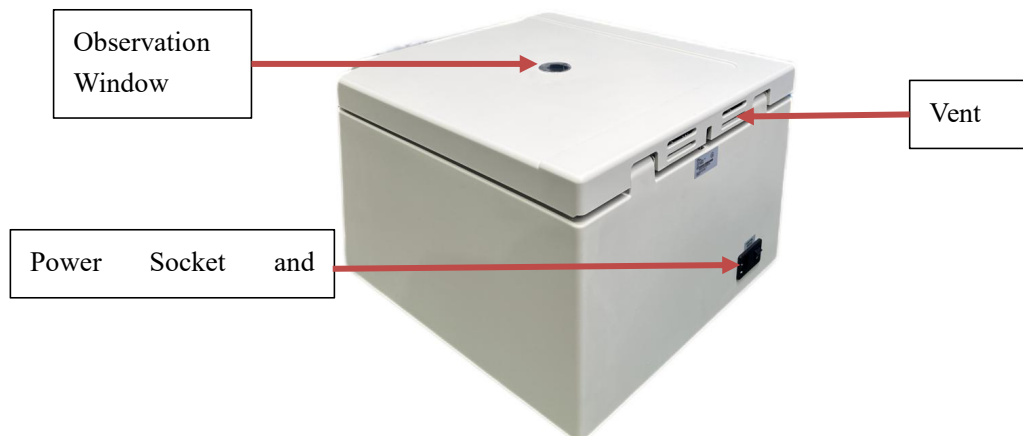


Figure 2 Rear View

Figure 1 and Figure 2 show the major interfaces of Centrifuge HX. On the front control panel there are command buttons and an LCD display. On the rear of the instrument there is a power switch and a power socket. Connect the power cable and switch power ON. User can set the experimental conditions using command buttons on the control panel.

## Chapter II Disassembly and installation

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

### 2.1 Disassembly

Tool: small cross screwdriver, large cross screwdriver, M4 hexagonal wrench



Step 1:

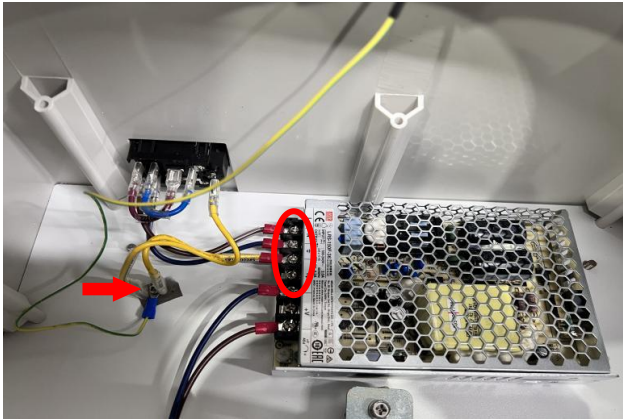
Insert a small cross screwdriver into the door latch and flick to the upper left to open the chamber.



Step 2:

Remove 3 fixing screws with a small cross screwdriver (in red circles as depicted in the figure left), and then remove the motor cover by hand.

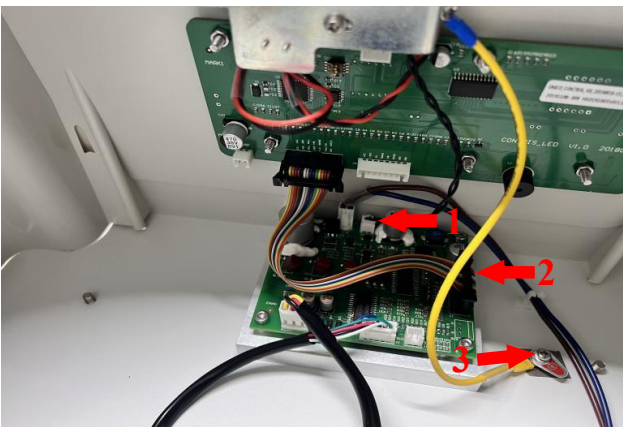
Remove 3 fixed screws with a large cross screwdriver (pointed by the red arrow in the figure left). Then lift the chamber up and remove it from the rest of the instrument.



**Step 3:**

Use a cross screwdriver to loosen the fixing screws for L, N, and PE cables (in red circles as depicted in the figure left).

Then loosen the plug of the ground cable of the coupler (pointed by the red arrow in the figure left) with a cross screwdriver.



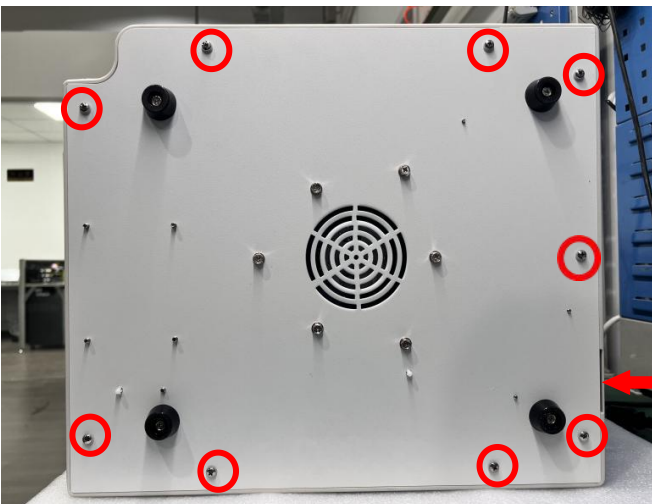
**Step 4:**

Pull out the magnet cable plug (pointed by the red arrow 1 in the figure left).

Then pull out the flat cable from the main circuits (pointed by the red arrow 2 in the figure left).

Remove the door lock ground cable (pointed by the red arrow 3 in the figure left) with a small cross screwdriver.

Then we can separate the bottom plate and upper casing.



**Step 5:**

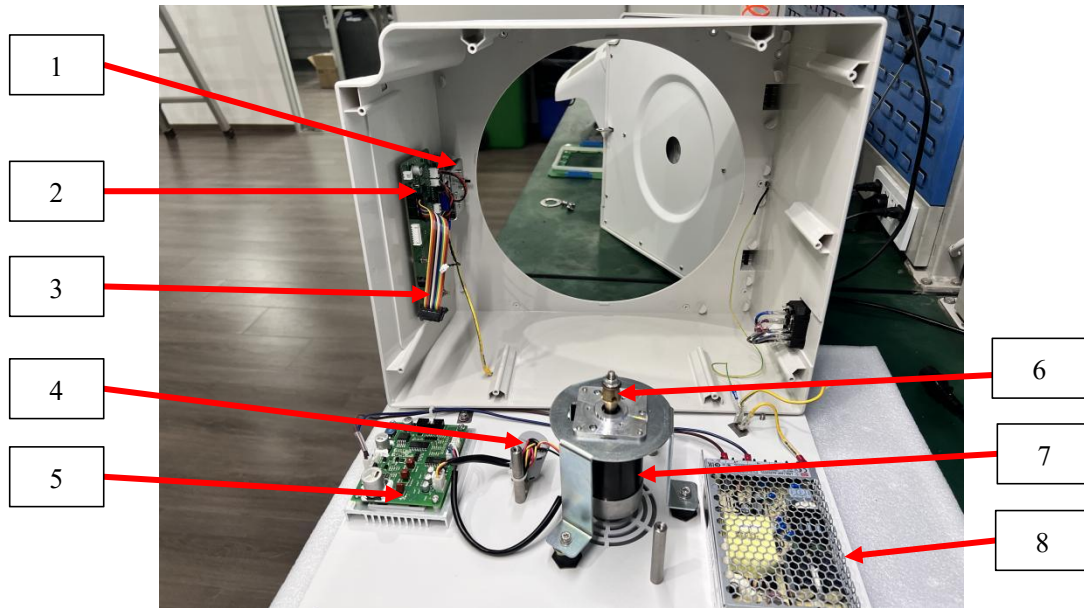
Turn the instrument upside down or sideways and then remove the 9 screws (in red circles as depicted in the figure left) with a cross screwdriver to remove the bottom plate.

Note:

(1) Use a small slotted screwdriver to gently move the bottom plate (pointed by the red arrow 3 in the figure left) if the bottom plate is too tight.

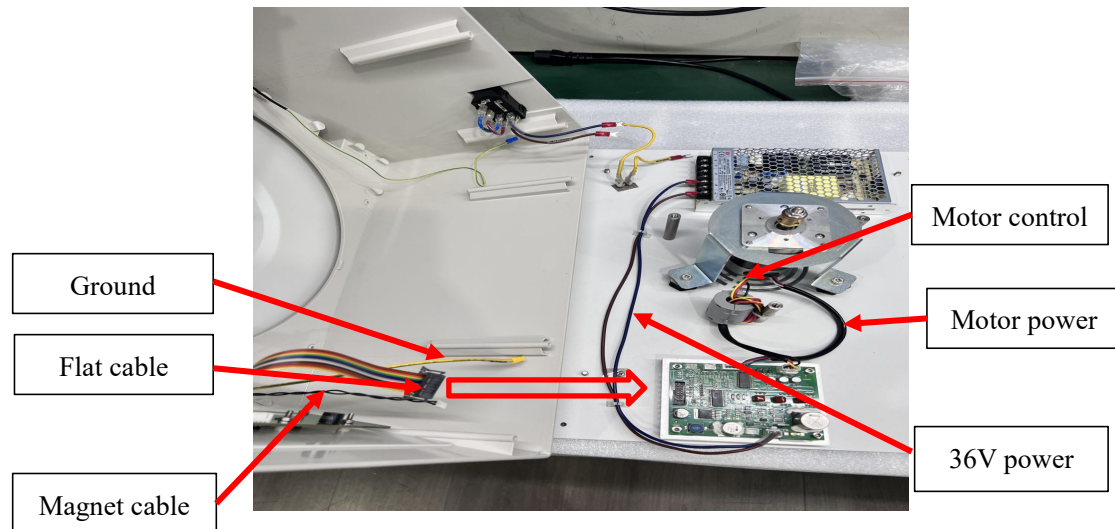
(2) Please make sure you do not break internal cables when removing the bottom plate.

**2.2 Description of key components**

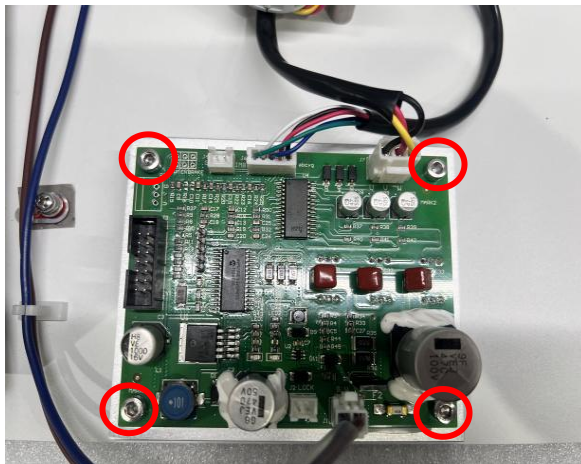


No.	Component	Part No.	No.	Component	Part No.
1	Door lock component	19100336	6	Motor shaft taper	19200854
2	Main circuits	19100354	7	Motor	19100341
3	Flat cable	19100347	8	Switching mode power supply (SMPS)	19100342
4	Magnet ring	19200403			
5	Driver circuits	19100350			

## 2.3 Cable layout and connections



## 2.4 Replace the driver circuits



### Step 1:

Disconnect cables from the driver circuits, including flat cable, magnet cable, motor power cable, motor control cable and 36V power cable.

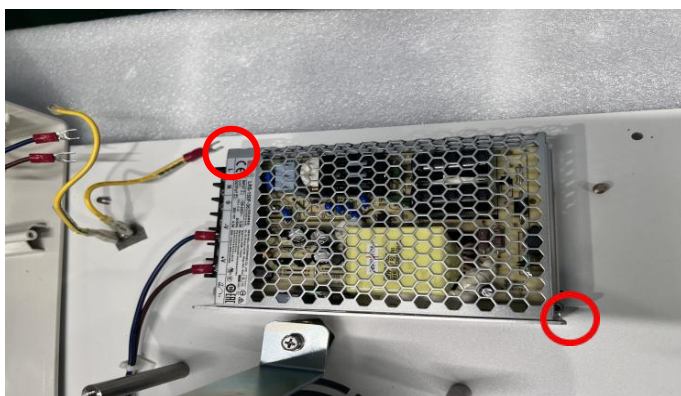
### Step2:

Remove the 4 fixing screws (in red circles depicted in the figure left) with M4 hexagonal wrench, and then remove the driver circuits from the aluminum heat sink.

### Step 3:

Replace the driver circuits with a new one and mount it back in position in reversed order. Please make sure the cables are connected to the correct position. For details, please refer to 2.3 Cable layout and connections.

## 2.5 Replace the switching mode power supply



### Step 1:

Disconnect the cables from the power supply, including AC input cables L, N and PE (Live wire, Neutral wire and Earth wire), DC output cables -V and +V.

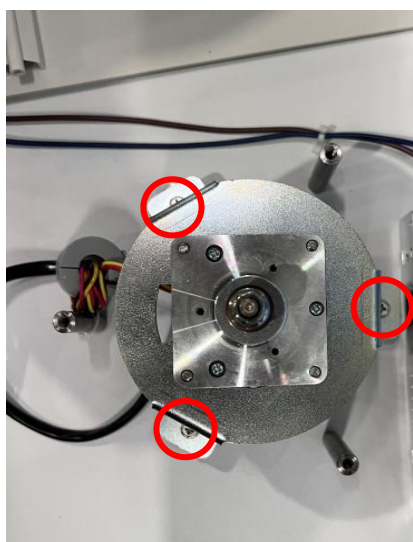
### Step2:

Remove the 2 fixing screws (in red circles depicted in the figure left) with a cross screwdriver, then remove the switching mode power supply.

### Step 3:

Replace the power supply with a new one. Mount it back in position in reversed order. For details, please refer to 2.3 Cable layout and connections.

## 2.6 Replace the motor



### Step 1:

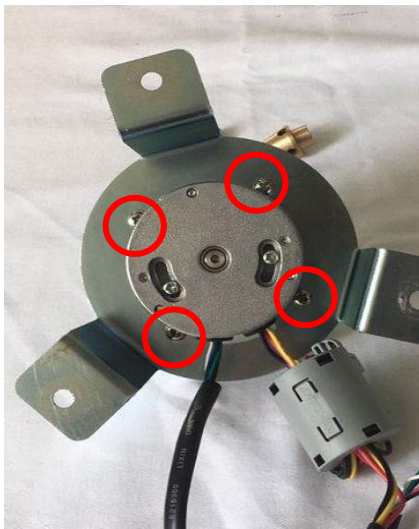
Remove the 3 fixing screws (in red circles depicted in the figure left) with a cross screwdriver, and then remove the motor together with the motor bracket.





Step 2:

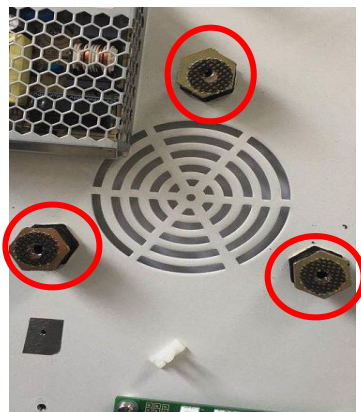
Screw the hexagon nut with flange out by hand and take out the motor shaft taper.



Step 3:

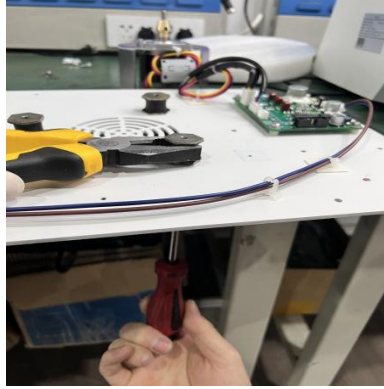
Remove the 4 fixing screws in red circles with a cross screwdriver, and then take the motor off the bracket.

## 2.7 Replace the vibration damper



Step 1:

After the motor is removed following the instructions in 2.6, you will notice that the vibration damper is secured on the bottom plate with three screws.



**Step 2:**

Use a plier to immobilize the vibration damper on one side with one hand. Use a cross screwdriver to rotate the screw counter-clockwise on the other side and remove it.



**Step 3:**

Replace the vibration damper with a new one. Mount it back in position in reversed order. Please make sure the cross screw is screwed into the threaded hole of the vibration damper.

## **2.8 Replace the main circuits**



**Step 1:**

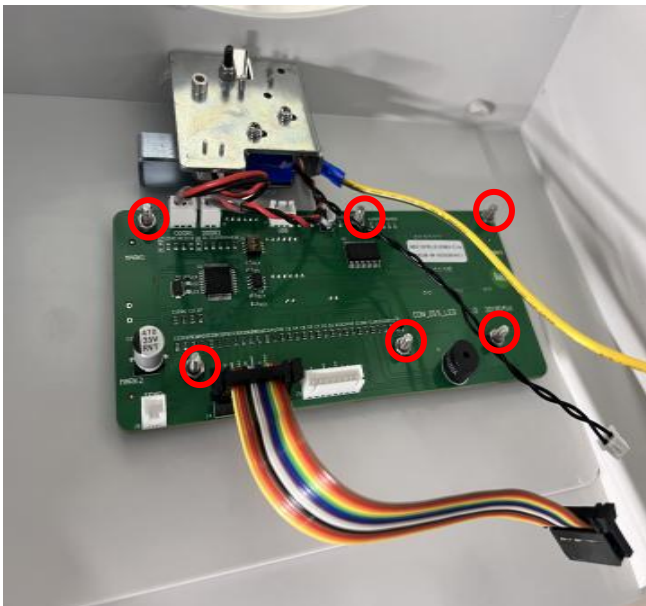
Peel off the film on the front panel.



Step 2:

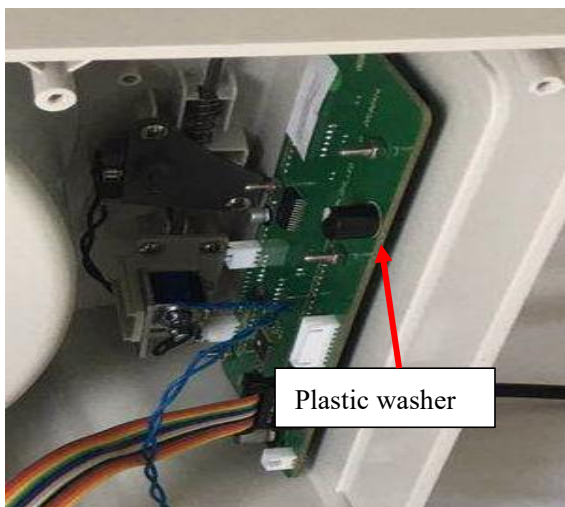
Remove the 4 fixing screws (in red circles depicted in the figure left) using a cross screwdriver.

Note: use a pair of long nose pliers to fix the nuts from inside.



Step 3:

Disconnect the flat cable and door lock signal cable from the main circuits and remove 6 cross head screws, then remove the main circuits.



Step 4:

Replace the main circuits with a new one. Mount it back to position in reversed order.

Please make sure the 6 plastic washers are installed between the main circuits board and the chassis of instrument and make sure that the flat cable and door lock signal cable are plugged onto correct position. For details, please

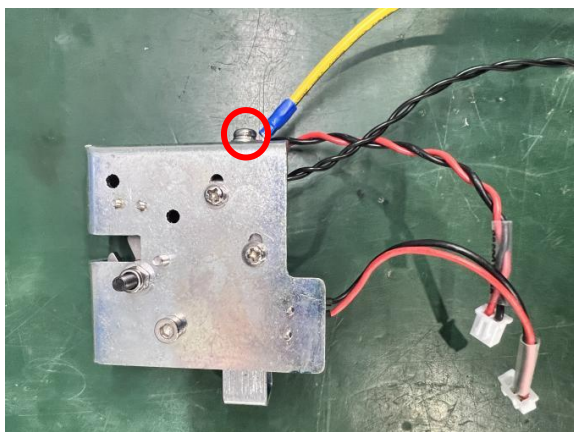
refer to 2.3 Cable layout and connections.

## 2.9 Replace the door lock component



Step 1:

Remove the 2 screws (in red circles depicted in the figure left) with a cross screwdriver, and then disconnect the cable between door lock component and main circuits. Then hold the door lock component and remove it.



Step 2:

Remove the screw from the ground wire with cross screwdriver and then replace the door lock component. For details, please refer to 2.1 Disassembly.

## Chapter III Analysis on FAQs

An error code will appear in the time section on the LCD display when the instrument malfunctions. Check the following table to locate the problem. Contact the manufacturer or certified distributor for more detail.

Error Code	Possible Causes	Solutions
E02 Door Lock	1. The door is open during running.	Power off the centrifuge immediately.
	2. The door lock component is not installed correctly.	Adjust or reinstall the door lock component.
	3. The door lock component failure.	Check and replace the door lock component.

E05 Driver Circuits Overload	<ol style="list-style-type: none"> <li>1. Overloaded.</li> <li>2. Driver bridge damaged.</li> <li>3. Driver control signal abnormal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Power off the centrifuge immediately.</li> <li>2. Check if the rotor is compatible.</li> <li>3. Check if the rotor is overloaded.</li> </ol>
E09 Imbalanced Rotor	1. The rotor is not balanced.	Rebalance the rotor with the scale and insert the tubes symmetrically into the rotor.
	2. The rotor does not fit onto the motor shaft.	Reinstall the rotor onto the motor shaft.
	3. Altered dynamic balance position.	Adjust the dynamic balance position.
	4. Vibration damper damaged.	Replace the vibration damper.
E11 Motor No Work	1. Unstable connection between the main circuits and the driver circuits.	Reconnect the circuits.
	2. Speed sensor malfunction.	Replace the speed sensor (motor).
	3. Driver circuits malfunction.	Check and replace the driver circuits.
E17 Shaft Taper (No Magnet)	1. Shaft taper mis-installation.	No magnet on the shaft cone.
	2. Incorrect shaft taper magnet polarity.	Check the magnet polarity.
	3. Unstable connection of HALL signal cable.	Reconnect the HALL signal cable.
	4. HALL component damaged.	Check if HALL component is damaged.
E20 Overspeed	The runtime speed is 1000rpm higher than the speed setting due to unstable speed control signals.	Replace the speed sensor component or main circuits.