Service Manual

Centrifuge FX

VERSION020220421

Contents

Chapter I Introduction

Centrifuge FX is a medical device (laboratory centrifuge), applied for the separation of blood, urine or stool sample mixture.

Figure 1 Front View

Figure 2 Rear View

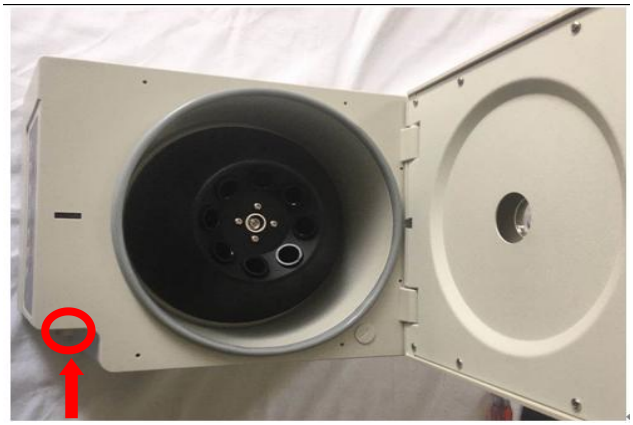
Figure 1 and Figure 2 show the major interfaces of Centrifuge FX. On the front control panel there are command buttons and an LED display. On the rear of the instrument there is a power switch and a power socket. Connect the power cable and switch power ON. Users can set the experimental conditions using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

Chapter II Disassembly and installation

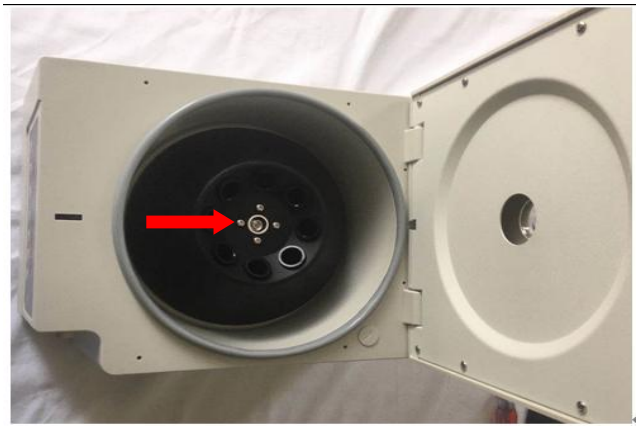
If the instrument does not work, analyze the cause first. Replace/ repair the failed components if the failure is due to hardware problem. Follow the instructions below to disassemble the instrument and replace components.

2.1 Disassembly

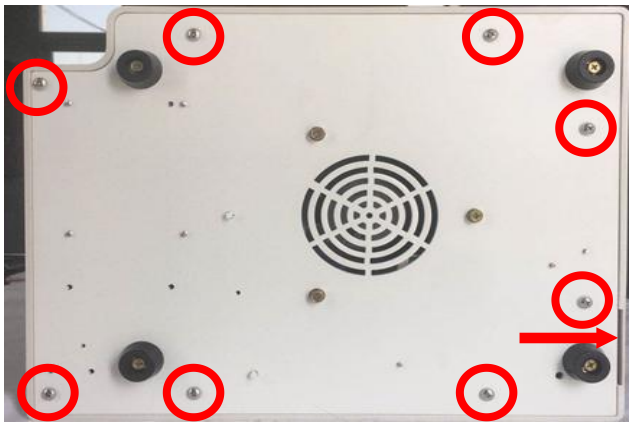
Tool: slotted screwdriver, cross screwdriver, M6 socket wrench, M10 socket wrench



Step 1:
Press the door button on the right side of the instrument to open the chamber.



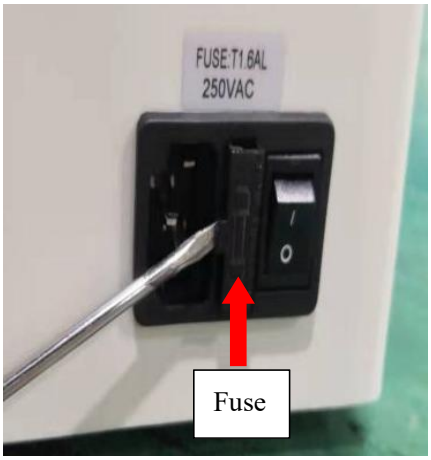
Step 2:
Remove the nut (pointed by the red arrow in the figure left) at the center of the rotor with M10 socket wrench. And then remove the rotor from the chamber.



Step 3:
Turn the instrument upside down or sideways and then remove the 8 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 in the figure left) if the bottom plate is too tight.

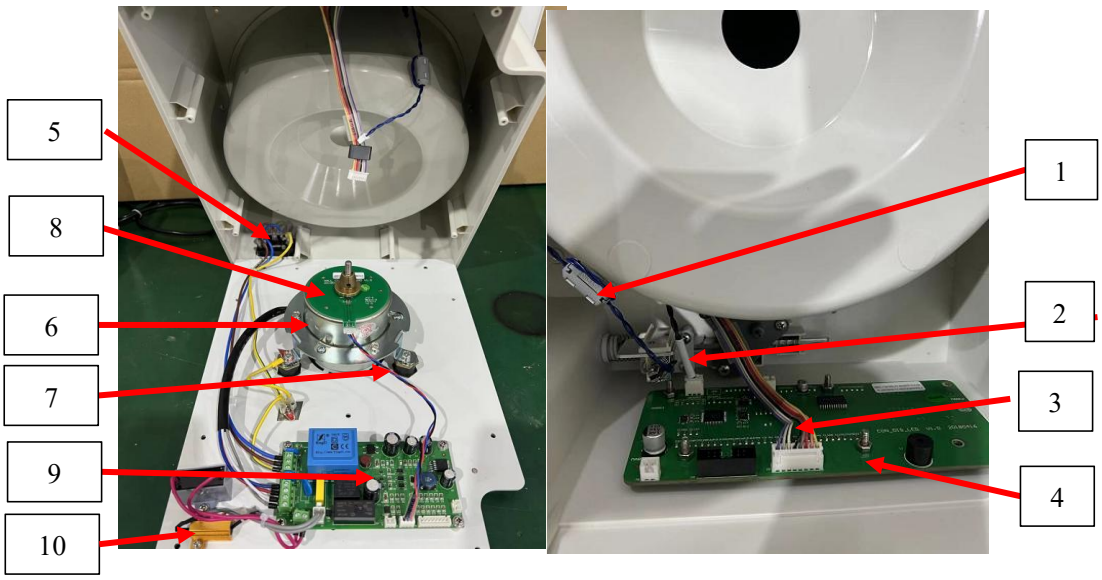
(2) Please make sure you do not break internal cables when removing the bottom plate.



Step 4: Use a small slotted screwdriver to pry (the position pointed by the red arrow in the figure left)and then take out the fuse.

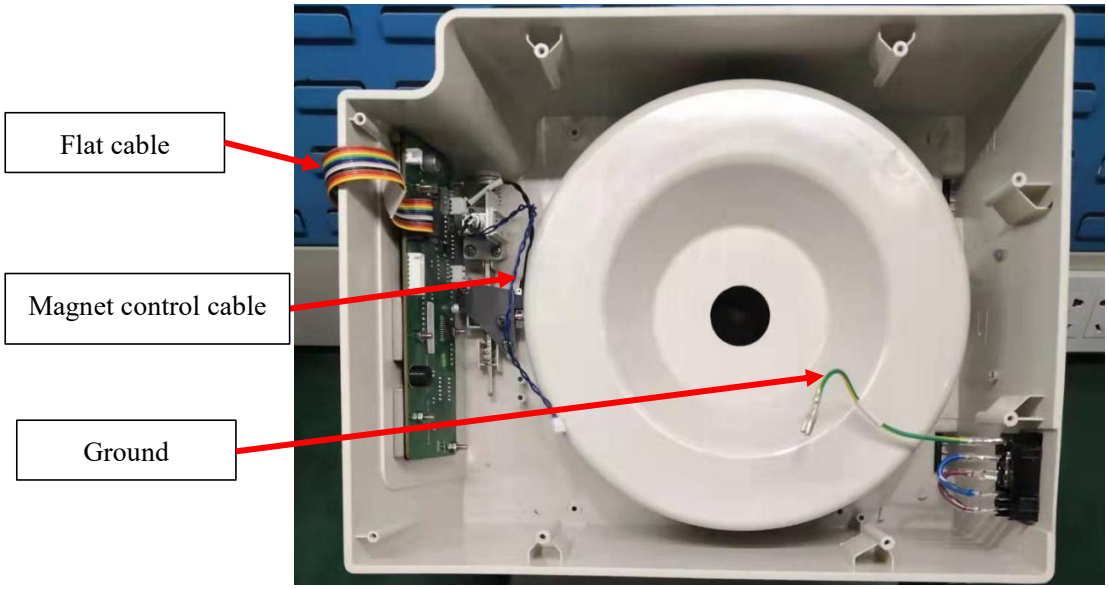
Step 5:
Unplug flat cable and magnet cable by hand (in red circles as depicted in the figure left) connecting with the main circuits.

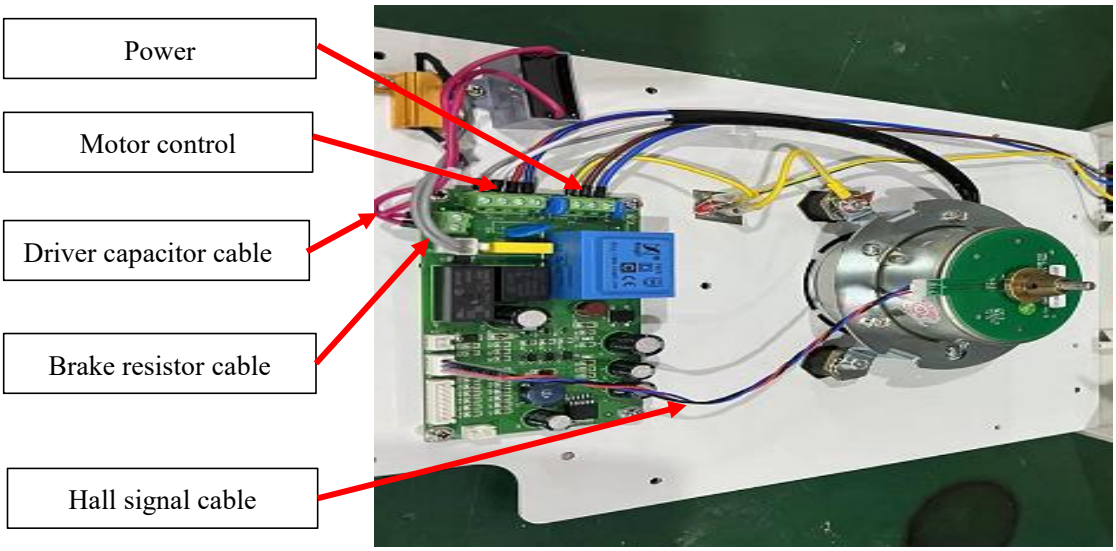
2.2 Description of key components



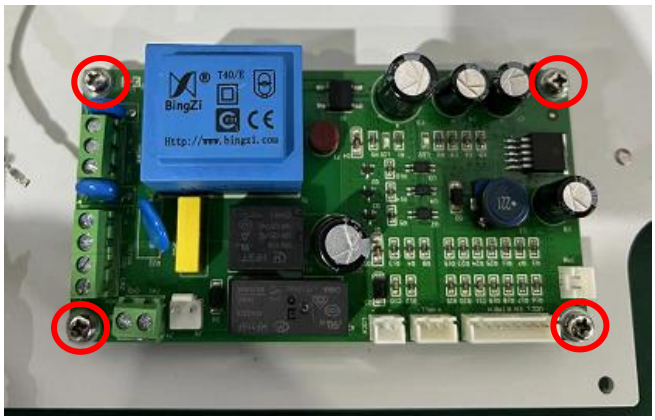
No.	Name	Part No.	No.	Name	Part No.
1	Magnet	19100362	6	Motor	19100366
2	Door lock signal cable	19100356	7	Vibration damper	19200871
3	Flat cable	19100373	8	HALL welding	19100417
4	Main circuits	19100374	9	Driver circuits	19100375
5	Power socket	19100152	10	Brake resistance	19100367

2.3 Cable layout and connections





2.4 Replace the driver circuits

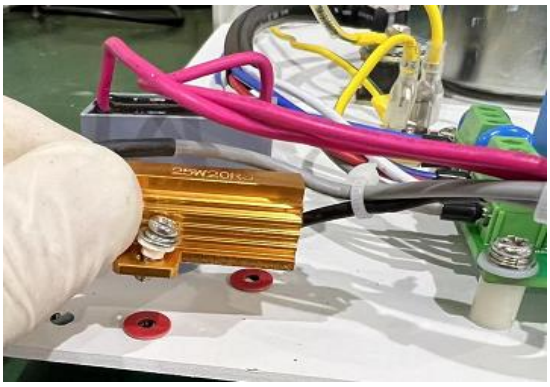


Step 1:
Disconnect cables from the driver circuits, including flat cable, magnet cable, motor power cable, motor control cable, brake resistor cable, and drive capacitor cable.

Step2:
Remove the 4 fixing screws (in red circles depicted in the figure left) with cross screwdriver, and then remove the driver circuits.

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 brake resistor



Step 1:
Disconnect the cable plug 2P of the brake resistor.

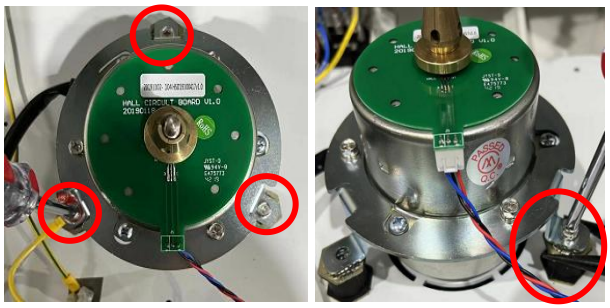
Step 2:
Remove the screws and gaskets with cross screwdriver, and then remove the brake resistor.

2.6 Replace the drive capacitance

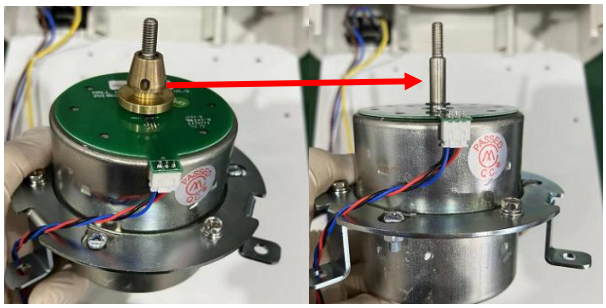
Remove the screws securing the capacitor and then remove the capacitor.

Replace the driver capacitor 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.

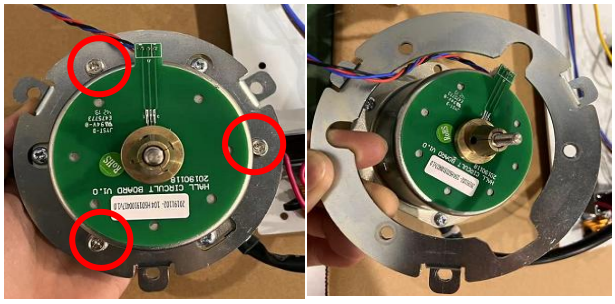
2.7 Replace the motor



Step 1:
Remove the 3 fixing screws with a cross screwdriver, and then remove the motor together with the motor bracket. Please hold the vibration damper in position with proper tools to prevent deformation when removing the bracket.

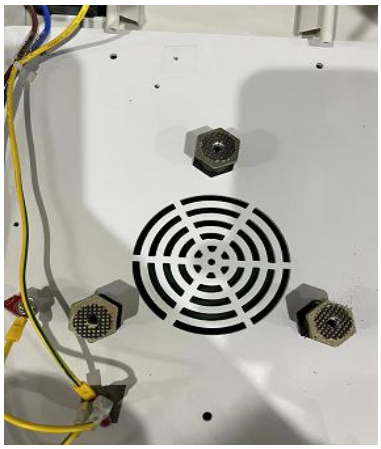


Step 2:
Then remove the motor shaft taper upwards by hand.



Step 3:
Remove the 3 fixing screws in red circles with a cross screwdriver or socket wrench, and then take the motor off the bracket.
Replace the motor with a new one and mount it back in position in reversed order.

2.8 Replace the vibration damper



Step 1:
Remove the 3 mesh gaskets above the vibration damper.

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.

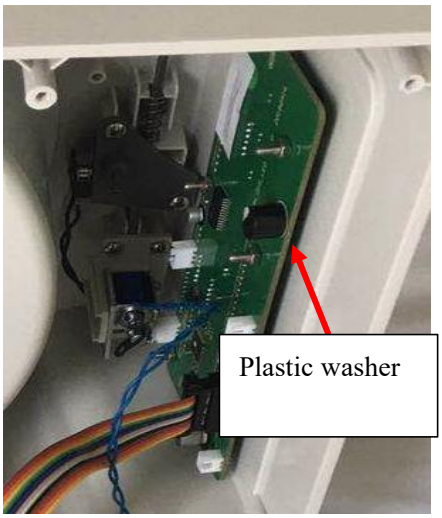
Step 3:
Replace the vibration damper with a new one and mount it back in position in reversed order.

2.9 Replace the main circuits

Step 1:
Peel off the film on the front panel.

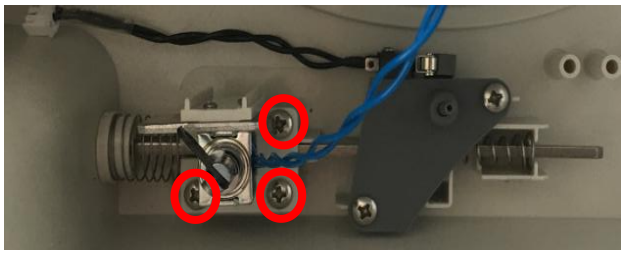
Step 2:
Remove the 4 fixing screws (in red circles depicted in the figure left) with a cross screwdriver.
Please use long nose pliers to fix the nuts inside.

Step 3:
Disconnect the flat cable and door lock signal cable with main circuits, then remove the main circuits.

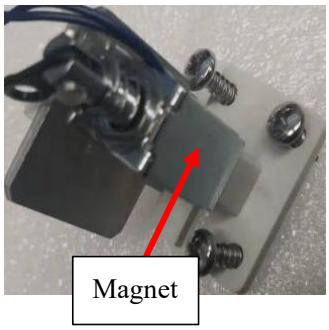


Step 4:
Replace the main circuits with a new one. Mount it back to position in reversed order.
Please make sure the 4 plastic washers are installed between the main circuits board and the chassis of instrument and make sure the position of flat cable plug and door lock signal cable plug. For details, please refer to 2.3 Cable layout and connections.

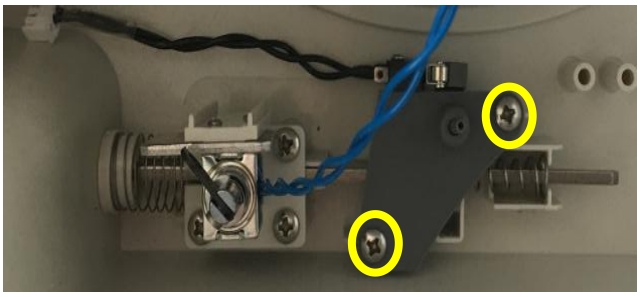
2.10 Replace the magnet



Remove the 3 fixing screws (in red circles depicted in the figure left) with a cross screwdriver, then replace the magnet.

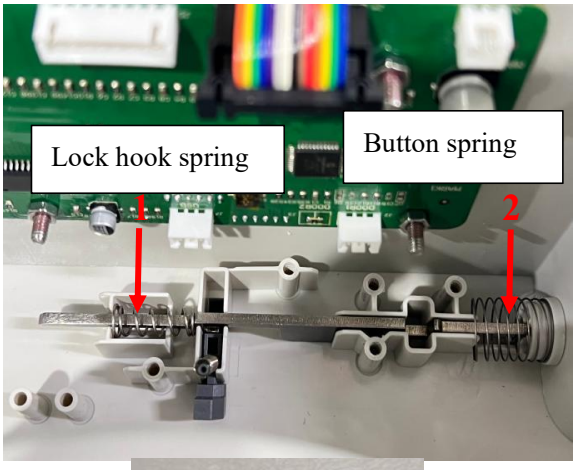


2.11Replace the door lock control components

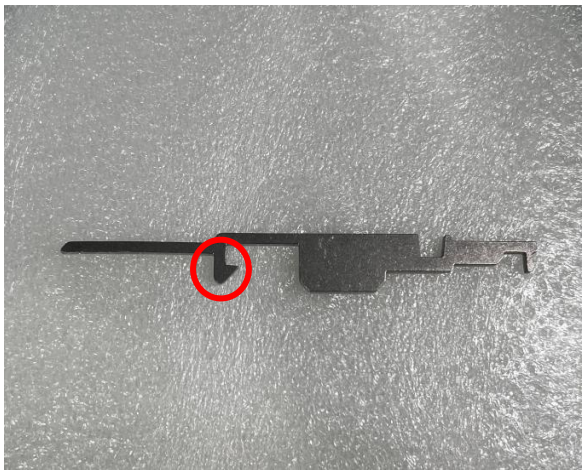


Remove the 2 fixing screws (in yellow circles depicted in the figure left) with a cross screwdriver, then replace the door lock control components.

2.12 Replace the lock hook



Step 1:
After removing the door lock control components and the magnet, we can see the lock hook and two springs next to the lock hook. Replace the lock hook with a new one. Mount it back in position in reversed order. Please make sure the springs are connected to the correct position.



Step 2:
If the upper cover of the centrifuge cannot be opened smoothly, remove the lock hook and observe whether there are burrs. If there are, use a metal file to eliminate them. Please refer to the step 1 to install the lock hook again.

Chapter III Analysis on FAQs

An error code will appear in the time section on the LED 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	1. Overloaded. 2. Driver bridge damaged. 3. Driver control signal abnormal.	1. Power off the centrifuge immediately. 2. Check if the rotor is compatible. 3. Check if the rotor is overloaded.
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.