BeneHeart DX&DM Series External Defibrillators

Service Manual

Version 4.0

P/N: 0659B-IS001

Table of Contents

1 Preface

1.1 Revision History

This manual has a revision number. This revision number changes whenever the manual is updated due to software or technical specification change. Contents of this manual are subject to change without prior notice. Revision 1.0 is the initial release of the document.

Version	Revision Date	Revision Description	Effective Date
4.0	2024–12–27	Add the description of ultrasonic probe software upgrade	
3.0	2024–07–19	Add WiFi + 4G module package	2024–07–26
2.0	2024–06–13	Change the CO2 maintenance description.	Not effect, invalid
1.0	2023–08–28	Initial version released.	2023–9–18

1.2 Intellectual Property Statement

Statement

Mindray has the final right to interpret this manual. Only when all of the following requirements are met, Mindray is responsible for the safety, reliability and performance of the product, namely:

- Assembly operation, expansion, readjustment, improvement, and repair are all carried out by professionals recognized by Mindray.
- All parts to be replaced during maintenance, accessories, and consumables used are original parts (original) of Mindray or approved by Mindray.
- The relevant electrical equipment complies with the national standards and the requirements of this manual.
- The product is operated as instructed in this manual.

1.3 Description

This manual provides detailed information about the hardware components, assembling, dissembling, testing and troubleshooting of this product and relevant accessories to support effective troubleshooting and repair. It is not intended to be a comprehensive, in-depth explanation of the product architecture or design principles. If you have any questions, please contact our Customer Service Department. This manual is based on the maximum configuration. Therefore, some content may not apply to the products that you repair. If you have any questions, contact our Customer Service Department. Read this manual carefully before you repair this product and ensure that you fully understand the content in this manual and can properly repair the product to prevent equipment damage and physical injury.

1.4 Applicability

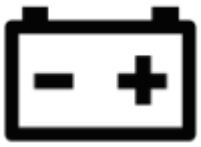
This manual is intended for professional biomedical engineers, authorized technicians or service representatives responsible for maintaining this product.

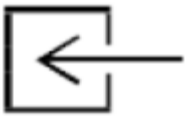
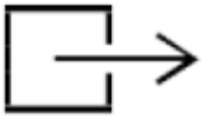
1.5 Password

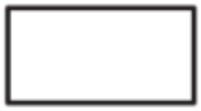
A password may be required to access different modules of the equipment. The passwords are listed below:

- User maintenance: 888888
- Factory maintenance: 332888
- Configuration management: 315666
- Demo: 2088

1.6 Symbols on the Device

	Refer to instruction manual/booklet		General warning sign
	Dangerous voltage		Shock button
	Manufacturer		Date of manufacture
	Alternating current		Direct current
	Power indicator		Status indicator
	Battery indicator		Computer network
	DEFIBRILLATION-PROOF TYPE CF APPLIED PART		DEFIBRILLATION-PROOF TYPE BF APPLIED PART
	Equipotentiality		Dust-protected; Protected against water jets

	Unlocking		Stand-by
	USB connector		Stop USB
	Medical Device		Input/output
	Gas inlet		Gas outlet
	Stacking limit by number		Keep dry
	This way up		Fragile; handle with care
	Humidity limitations		Atmospheric pressure limitations

	Temperature limitations		Non-ionizing electromagnetic radiation
	Serial number		No pushing

CE 2797	The product bears CE mark indicating its conformity with the provisions of the REGULATION (EU) 2017/745 on medical devices and fulfills the general safety and performance requirements of Annex I of this regulation.
	The following definition of the WEEE label applies to EU member states only. This symbol indicates that this product should not be treated as household waste. By ensuring that this product is disposed of correctly, you will help prevent bringing potential negative consequences to the environment and human health. For more detailed information with regard to returning and recycling this product, please consult the distributor from whom you purchased it. * For system products, this label may be attached to the main unit only.

1.7 Safety

Safety Information

DANGER

Indicates an imminent hazard that, if not avoided, will result in death or serious injury.

WARNING

Indicates a potential hazard or unsafe practice that, if not avoided, could result in death, serious physical injury, or product/property damage.

CAUTION

Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor physical injury or product/property damage.

NOTICE

Provides application tips or other useful information to ensure that you get the most from your product.

DANGER

DANGER

- **The equipment generates a high voltage during defibrillation, which may cause serious injury or death. Therefore, the equipment must be used by or under the instructions of clinical professionals. It must only be used by persons who have received adequate training in its use. Anyone unauthorized or untrained must not perform any operation on the equipment.**
- **Do not open the shells of the equipment, as you may suffer an electric shock. All servicing and upgrading operations of the equipment must be performed by the service personnel trained and authorized by our company only.**
- **To avoid explosion hazard, do not use the equipment in the presence of oxygen-rich atmospheres, flammable anesthetics, or other flammable agents (such as gasoline). Keep the equipment and the operating environment dry and clean.**
- **Defibrillation current can cause severe injury or even death to operators or bystanders. Keep a distance with the patient or metal devices connected to the patient during defibrillation.**

WARNING

⚠WARNING

- Before putting the system into operation, the operator must verify that the equipment, connecting cables, and accessories are in correct working order and operating condition.
- Make sure the synchronous input system is applied to this equipment and the input signal is correct if necessary.
- To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth. If the installation does not provide a protective earth conductor, disconnect it from the power cord and operate it on smart lithium-ion batteries.
- This equipment is used for a single patient at a time.
- This equipment is not suitable for use in a nuclear magnetic resonance (MR) environment.
- To avoid fire or explosion hazard, do not use the equipment in the oxygen-rich environment, or with the presence of flammable anesthetics, vapor, or liquids.
- Do not open the shell of the equipment, as you may suffer an electric shock. All servicing and upgrading operations of the equipment must be performed by the service personnel trained and authorized by our company only.
- Medical electrical equipment which does not incorporate defibrillator protection should be disconnected during defibrillation.
- Do not defibrillate a patient who lies on the wet ground.
- Set alarm volume and alarm limits based on the patient's actual condition. Do not rely exclusively on the audible alarm system for patient monitoring. Adjustment of alarm volume to a low level or off may result in a hazard to the patient.
- Do not perform any functional check if the equipment is connected with a patient; otherwise, the patient might be shocked.
- Remain attentive to the patient during applying therapy. Delay in delivering a shock may result in a rhythm that was analyzed as shockable converting spontaneously to non-shockable and could result in inappropriate delivery of a shock.
- For the treatment of patients with implantable pacemakers, place therapy pads or paddles away from internal pacemaker generator if possible to help prevent damage to the pacemaker.
- To avoid inadvertent disconnection, route all cables in a way to prevent a stumbling hazard. Wrap and secure excess cabling to reduce risk of entanglement or strangulation by patients or personnel.

- Do not touch device connectors, recorder thermal print head, battery connector or other live equipment if in contact with the patient; otherwise, patient injury may result.
- To ensure patient safety, use only parts and accessories specified in this manual.
- Package material may contaminate the environment. Properly dispose of the package material according to applicable waste control regulations and keep it out of children's reach.
- Do not touch the patient and live parts simultaneously.

CAUTION

⚠CAUTION

- **Use of Manual Therapy security password requires the clinician to know and remember the password. Failure to enter correct password will prevent the delivery of manual defibrillation, synchronized cardioversion, and pacing therapy.**
- **At the end of its service life, the equipment, as well as its accessories, must be disposed of in compliance with the guidelines regulating the disposal of such products to avoid contaminating the environment.**
- **Electromagnetic field may affect the equipment performance. Therefore, other devices used in the vicinity of the equipment must meet corresponding EMC requirements. Mobile phones, X-ray equipment or MRI devices are a possible source of interference as they may emit higher levels of electromagnetic radiation.**
- **Before connecting the equipment to the power cord, check that the voltage and frequency ratings of the power cord are the same as those indicated on the equipment's label or in this manual.**
- **Always install or carry the equipment properly to avoid damage caused by drop, impact, strong vibration or other mechanical force.**
- **Dry the equipment immediately in case of rain.**
- **Never charge and deliver shock frequently in non-clinical situations. Otherwise, equipment damage could occur.**
- **Do not mix electrodes of different types or brands. Mixing electrodes may lead to a great baseline drift or longer baseline recovery time after defibrillation.**
- **To avoid polluting or infecting people, the environment, or other equipment, the equipment and its accessories that have reached the service life must be disposed of according to the relevant local regulations or the hospital system.**

NOTE

NOTICE

- **Put the equipment in a location where you can easily view, operate, and maintain the equipment.**
- **The equipment uses a mains plug as isolation means to the AC mains power supply. Do not locate the equipment in a place difficult to operate the mains plug.**
- **During normal use, the operator shall stand in front of the equipment.**
- **Keep this manual in the vicinity of the equipment so that it can be obtained conveniently when needed.**
- **If the equipment runs on a DC power supply, a DC/AC adapter supplied by our company should be used.**
- **This manual describes all features and options. Your equipment may not have all of them.**

2 Product Knowledge

2.1 Product Overview

2.1.1 Introduction

This product is intended for use in medical institutions.
The BeneHeart DX Defibrillator/Monitor provides manual defibrillation, AED, cardiac pacing, and monitoring functions, and can be used for first aid and monitoring in or out of a hospital.

Indications

Monitoring	Applicable to adults, pediatrics, and neonates.
Semi-automatic external defibrillation	Applicable to patients with all the following conditions: • Be delirious. • No breathing. • No pulse.
Manual external defibrillation	Applicable to patients with ventricular fibrillation or tachycardia and no breathing and no pulse.
Synchronized cardioversion	Used to stop atrial fibrillation.
Cardiac pacing	Applicable to patients with bradycardia, and helpful to patients with cardiac arrest if used in time.

Contraindications

Monitoring	Unknown
Semi-automatic external defibrillation	Not applicable to patients with any of the following conditions: • Be conscious. • Have breathing. • Have pulse.
Manual external defibrillation	Not applicable to patients with any of the following conditions: • Be conscious. • Have breathing. • Have pulse.
Cardiac pacing	Not applicable to patients with ventricular fibrillation. Use the non-invasive cardiac pacing function with caution when the patient's temperature drops seriously.

2.1.2 Main Functions

The BeneHeart D30 Defibrillator/Monitor mainly provides the following functions:

- Manual defibrillation
  The manual defibrillation mode supports manual defibrillation and synchronized cardioversion. Manual defibrillation can be performed with external paddles, internal paddles, or multifunctional electrode pads. This mode provides a simple three-step defibrillation procedure. The operator needs to analyze the patient's ECG waveforms and perform the following steps:

1. Turn on the defibrillator and select the energy level.
2. Charge the defibrillator.
3. Deliver an electric shock to the heart of the patient.

- AED
  In AED mode, BeneHeart D30 automatically analyzes the patient's ECG waveforms and provides a suggestion on whether to deliver an electric shock. The operator can follow the voice and text instructions to complete the defibrillation procedure. In AED mode, if an electric shock is recommended, the defibrillator charges automatically, and the operator only needs to press the electric shock button. This button is highlighted by blinking backlight.
- Cardiac pacing
  The cardiac pacing mode provides the non-invasive cardiac pacing function. Pacing pulses are made in single-phase waveforms and transfer energy through multifunctional electrode pads.
- Monitoring
  In monitoring mode, the monitoring of vital sign parameters such as ECG, SpO2, TEMP, NIBP, two-channel IBP, CO2, and Resp can be implemented through external modules (hard connection or wireless connection). The monitor supports display, review, storage, and printing of monitoring information.

2.2 Main Unit Composition

2.2.1 System Composition

The BeneHeart D30 Defibrillator/Monitor is composed of the main unit, accessories, and PC software. The main unit is the core of the system and provides the following functions:

- System control
- Power supply to the system
- Display
- Defibrillation and cardiac pacing
- AED
- User input
- Sound and light alarms

- Measurement of multiple parameters
- Interfacing and communication with other systems
- Record printing and data storage

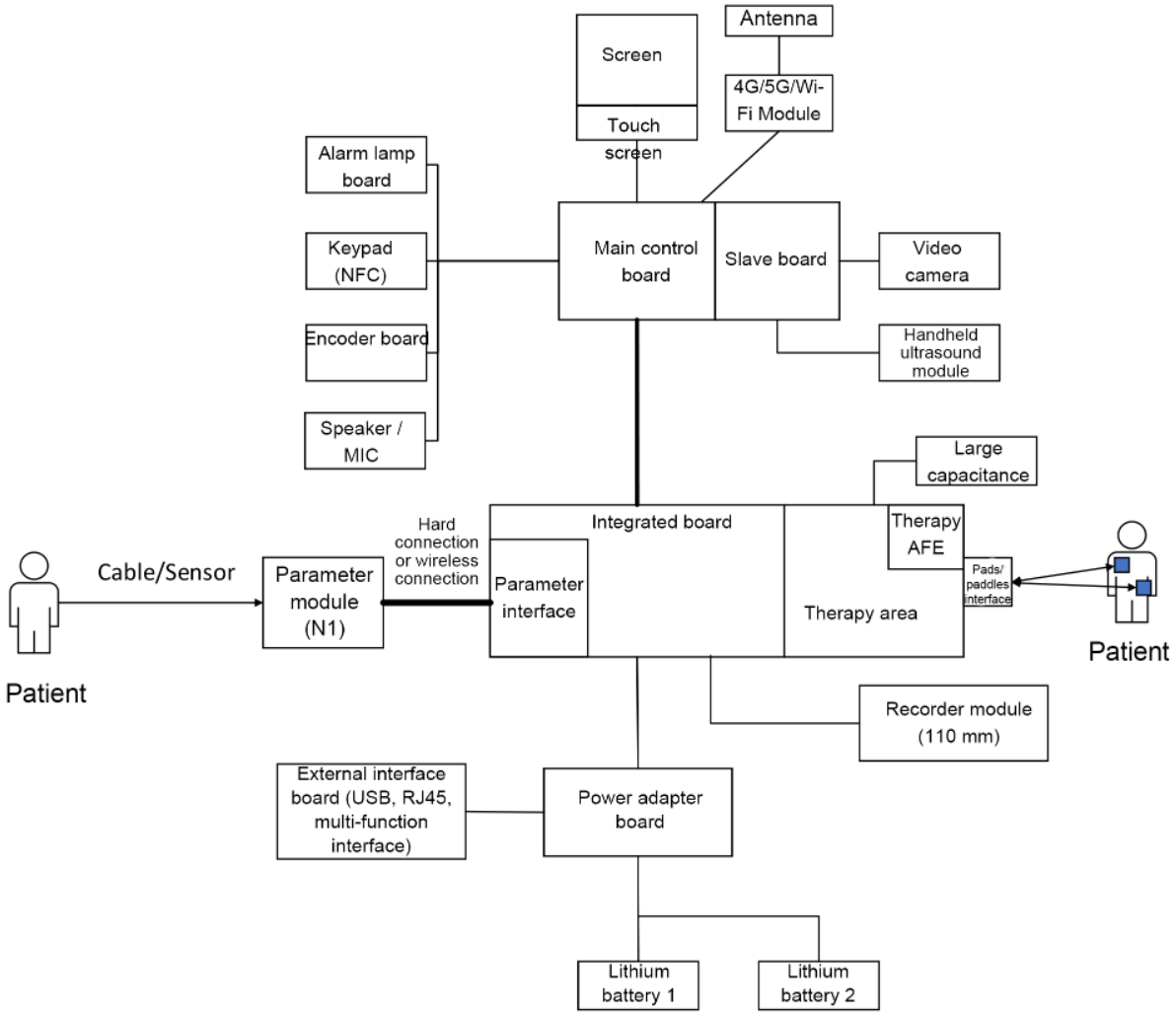
Hardware Working Principles

Hardware Working Principles Overview

The system structure is shown in the following figure. The front shell is carried by the main control board and secondary processor board. The 4G/5G/Wi-Fi module, encoder board, keypad, alarm LED board, touch screen, display, and speaker are connected to the main control board with cables. The main control board and secondary processor board are the core components for system control, and provide human-machine interfaces for system control, voice prompt, display, and button control. The 4G/5G/Wi-Fi module is connected to the main control board to provide information for pre-hospital emergency care (such as parameters, waveforms, and reports), send system self-test results, and support remote device management through wireless communication. The system delivers the hand-held ultrasound function through the slave board. The rear shell takes the integrated board (including power management, parameters, and therapy board) as the core. The parameter module (N1) is connected to the integrated board through hard connection or wireless connection to implement the functions of measuring and monitoring the patient's vital sign parameters. ECG, SpO2, NIBP, TEMP, Resp, IBP, CO2 and other monitoring functions can be implemented simultaneously through the parameter module. The recorder module, power adapter board, and other board are connected to the non-therapy part of the integrated board to implement their functions. The recorder module prints measurement records on 110-mm-wide paper tape. The power adapter board provides external interfaces and connections with lithium batteries, and works with the power part of the integrated board to implement system power switching control, system power monitoring, and battery charge/discharge management. The therapy part of the integrated board connects to the patient (under treatment) through the external/internal paddles and multifunctional electrode pads to measure ECG data, impedance, and other parameters, and provide defibrillation therapy.

Block Diagram of Hardware Working Principles

Figure2–1



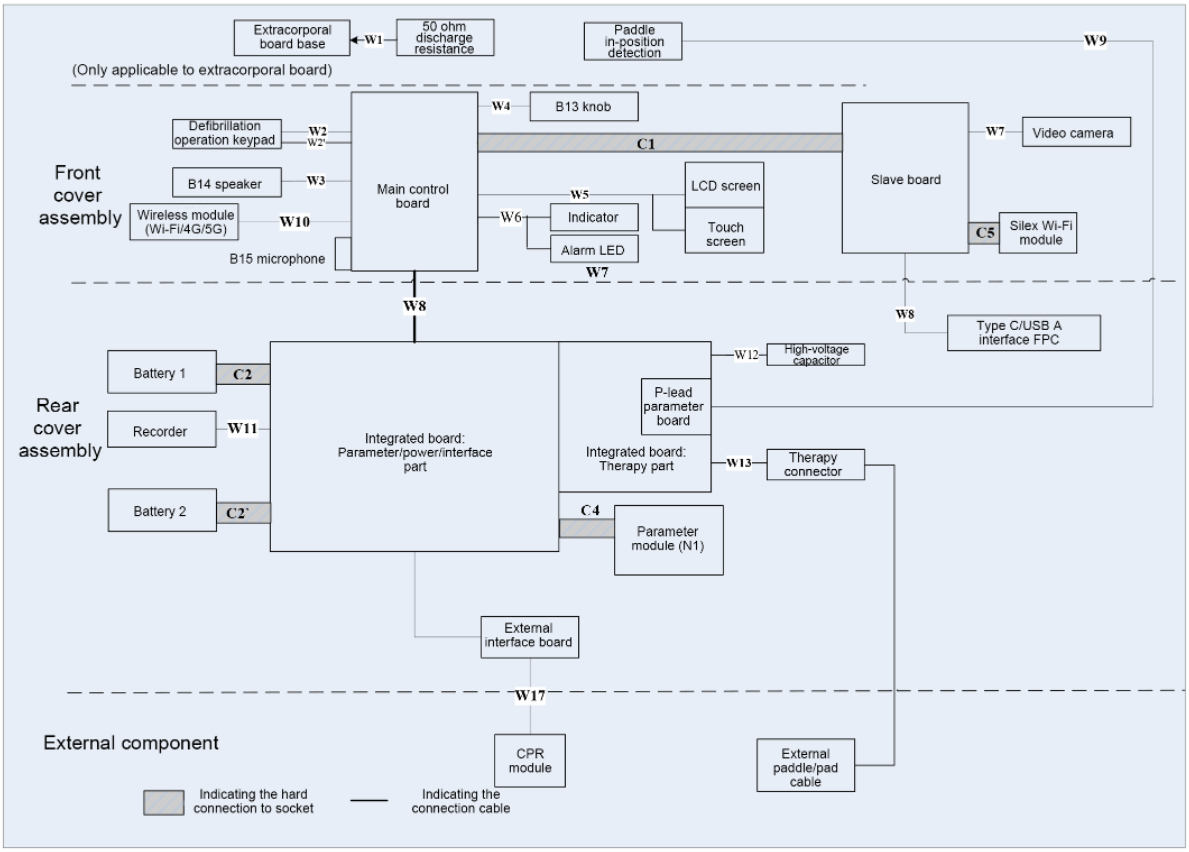
2.2.2 System Structure/Connection Diagram

The main unit consists of the front cover assembly, rear cover assembly, and electrode base that holds external paddles.

- The front cover assembly consists of the following parts: LCD screen/touchscreen, keypad board, speaker, microphone, main control board, slave board, knob, alarm/indicator board, encoder board, Wi-Fi module (Wi-Fi, 4G, and 5G), and front shell.
- The rear cover assembly consists of the following parts: integrated board, power interface board, external interface board, high-voltage capacitor, parameter module connectors, therapy interface, recorder, main bracket, and rear shell.
- The electrode base assembly consists of the contact resistor, top shell, and in-position detection connector. It holds a pair of external paddles.

System Structure/Connection Diagram

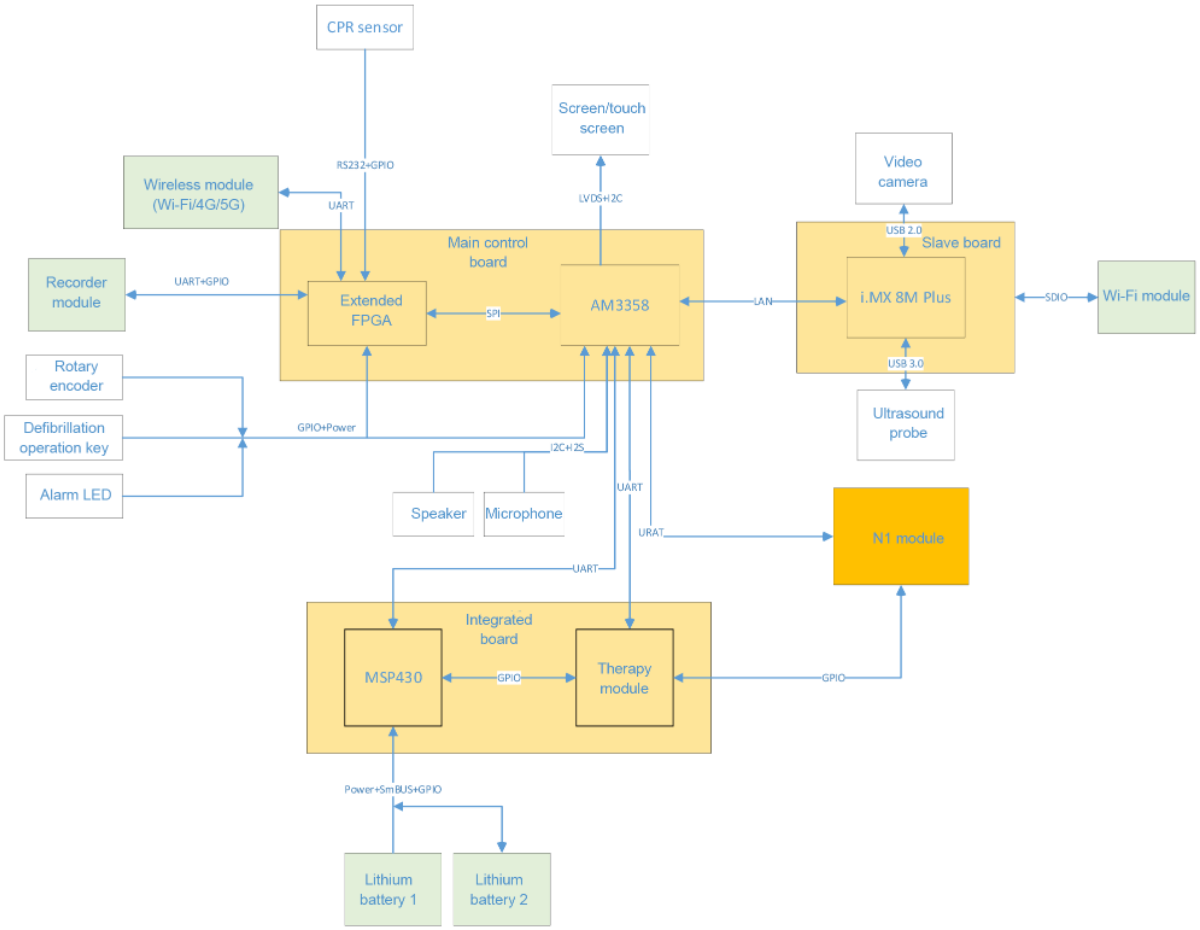
Figure2–2



2.2.3 System Signal Flow Diagram

The system uses the main control board as the core to control the power supply, therapy module, and multi-parameter module. The main control board uses AM3358 as the main processor, which supports peripherals by expanding through FPGA. For reliability purposes, peripherals related to core functions of the system, such as the therapy module, multi-parameter module, power management module, and speaker directly interact with AM3358. Other none-core modules such as the recorder module, Wi-Fi module, and CPR sensor, interact with the expanded FPGA. Modules with a high failure rate such as keys and encoder are connected to both AM3358 and FPGA for redundancy design. The system can use the slave board to realize functions of the camera and hand-held ultrasound image module, and expands other wireless functions through the high-speed Wi-Fi module. The main control board interacts with the slave board through a LAN. See the following figure:

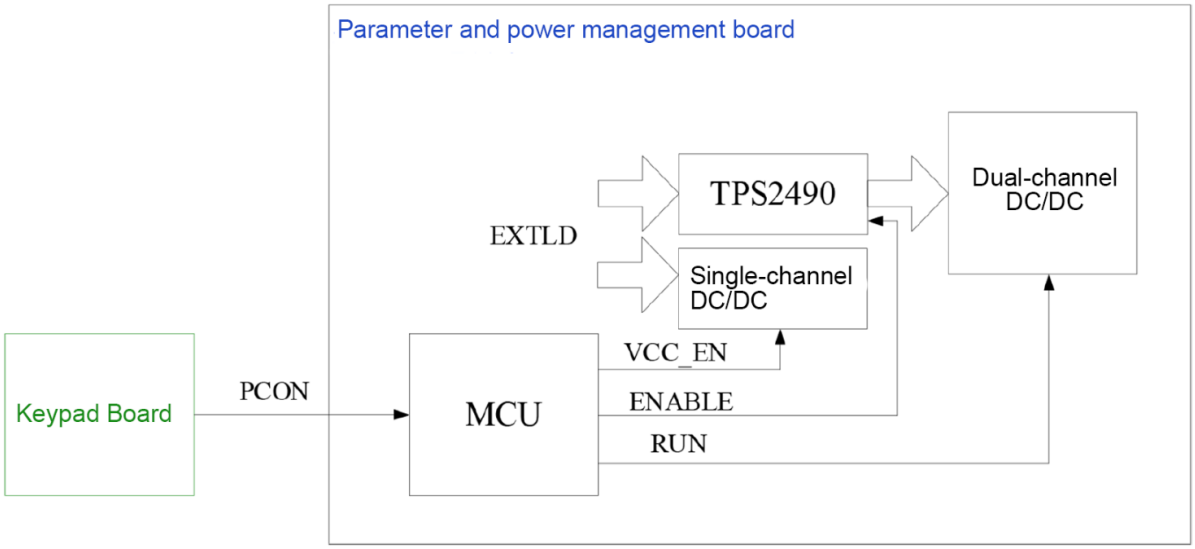
Figure2–3



2.2.4 Sequence of Power-On/Off Signals

The equipment is powered on and off by the power key on the front shell keypad board. The process is controlled by the power management processor as follows:

Figure2–4



Power-on: Press the power key on the front panel of the equipment. The PCON signal changes from 1 to 0. The MCU wakes up, immediately outputs an ENABLE signal to TPS2490 to enable VBUS, enables the RUN signal of the dual-channel DC-DC module, and then outputs 5 V (VBB) and 12 V voltages.

Power-off: Hold down the power key for more than three seconds until the PCON signal changes from 0 to 1. The MCU notifies the upper controller of the power-off operation after detecting the power-off signal. After receiving the power-off command from the host controller, the MCU outputs ENABLE=0 and RUN=0, and then turns off the VBUS and lower-level DC-DC module.

2.2.5 Front Cover Assembly

The front cover assembly consists of a display assembly, a keypad board, a main control board, a Wi-Fi module, a speaker, a microphone, a knob, an alarm board, an encoder board, and a front shell.

Knob

You can rotate the knob encoder clockwise or counterclockwise and then press it to confirm a selection. The knob encoder is connected to the main control board through the encoder board.

Keypad Board

The keypad board provides defibrillation buttons such as Energy+, Energy-, Charge, Discharge, and AED, and power-on and power-off buttons of the equipment.

Speaker

The speaker emits alarm tones, key-stroke tone, heart beats, and PR sound. It supports the functions of PITCH TONE and the multi-level volume. The speaker is connected to the main control board.

Microphone

It provides the function of voice recording.

Alarm lamp board

An alarm lamp board interface is provided. The alarm lamp transmits signals to drive the red and yellow alarm lamps. The drive current is 60 mA.

Wi−Fi Module

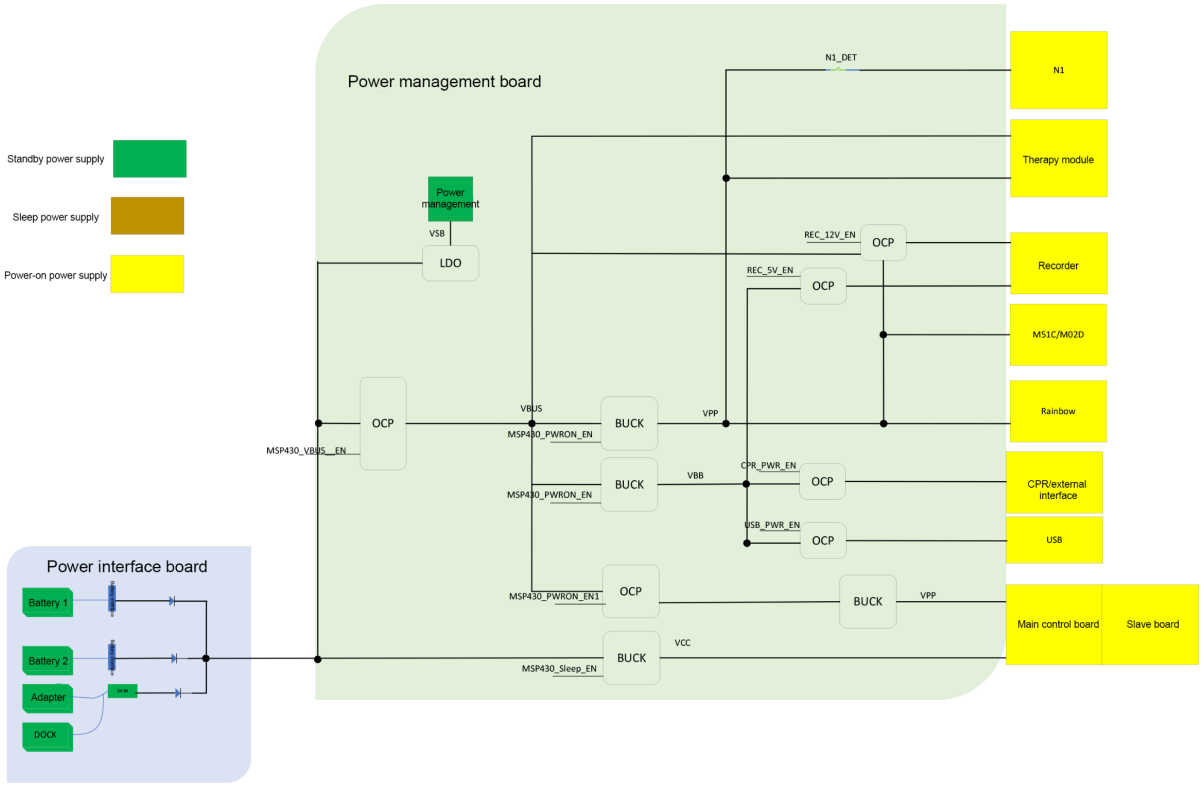
It supports wireless communication in Wi-Fi, 4G, or 5G mode.

2.2.6 Rear Cover Assembly

The rear cover assembly consists of the following parts: integrated board, high-voltage capacitor, recorder, lithium battery, rear shell, parameter module interface, and therapy interface.

Power System

Figure2–5

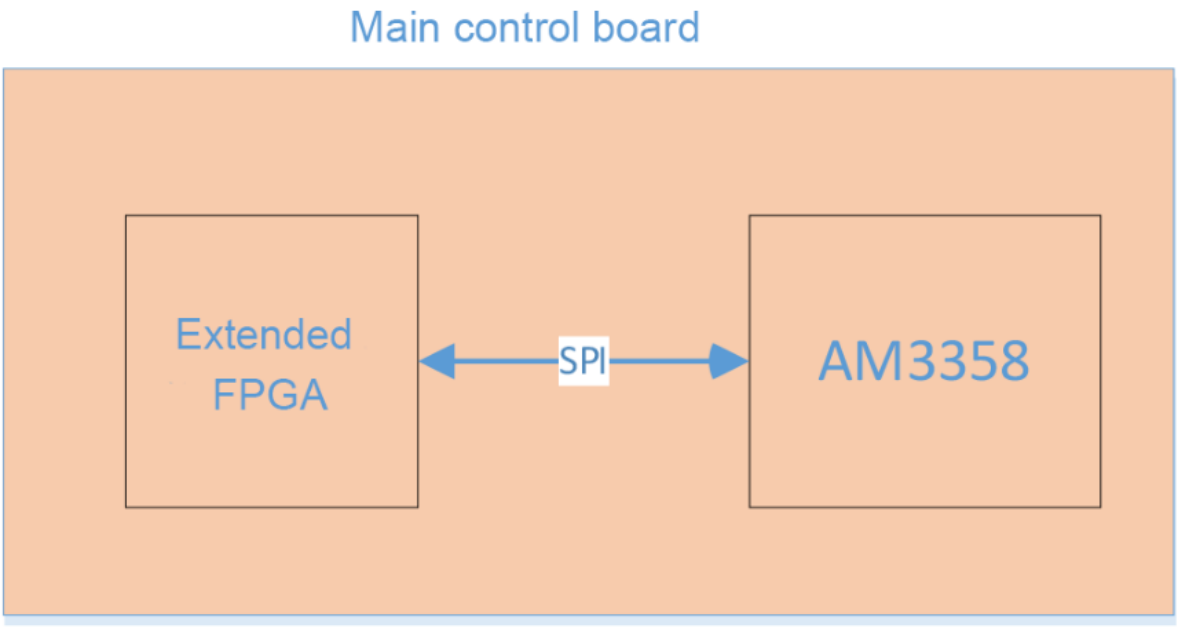


- The DX only supports DC input power supply or battery power supply.
  Battery: The rated voltage is 14.4 V, 4500 mAh.
  DC input: 18 V, output by adapter or Dock.
- The power management board manages the system power input, supplies different system power, and monitors the power status. The power management part implements battery charging and status information management.

Main Control System

Using AM3358 as the main controller, the main control system controls system functions through expanded FPGA peripherals. Serving as the core of the system, the main control system implements functions such as man-machine interaction, page display, parameter storage, printing, and review, and parameter algorithm processing.

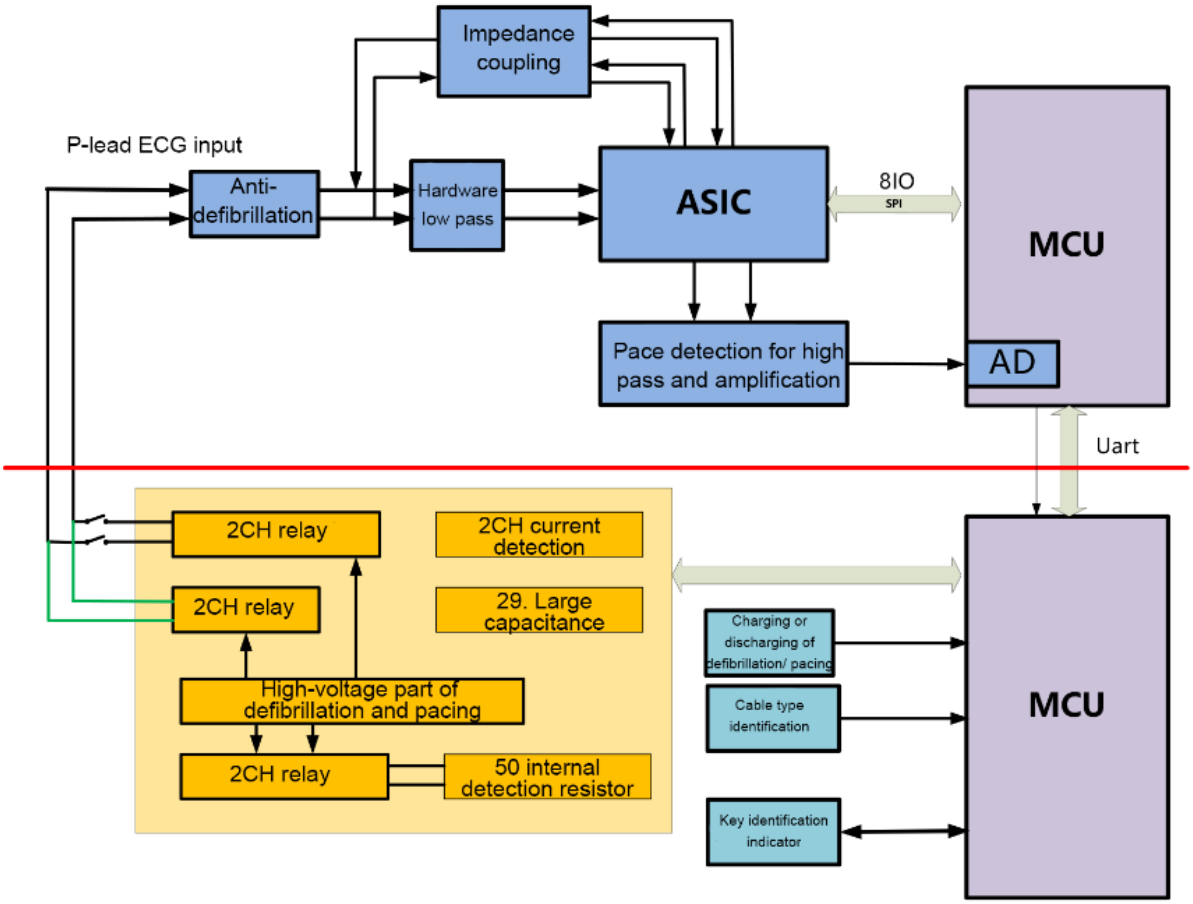
Figure2–6



Therapy System

The therapy system implements the measurement of P-lead input ECG and human body impedance, as well as the defibrillation and pacing functions.

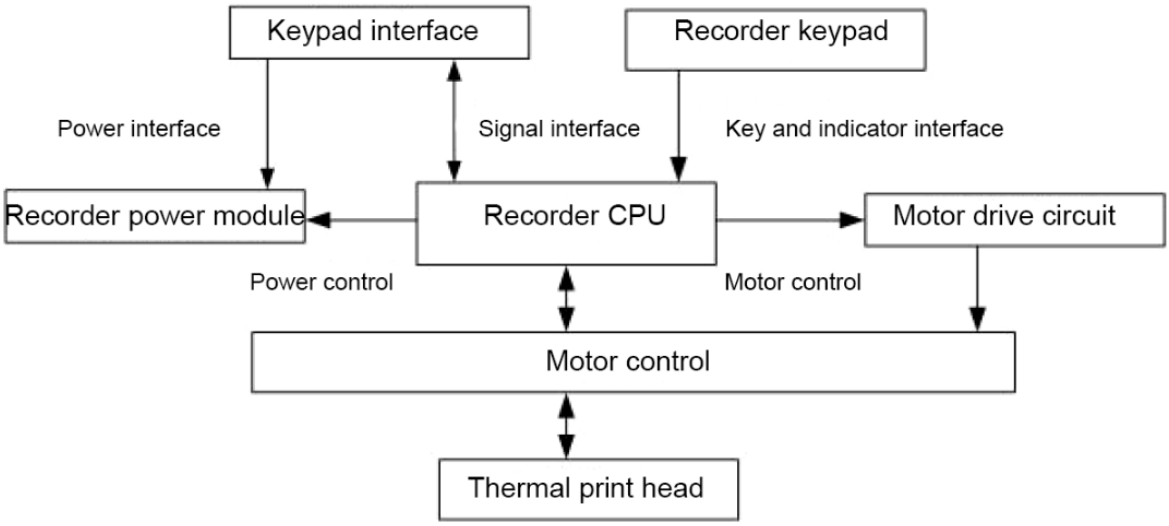
Figure2–7



Recorder

The recorder implements parameter and waveform printing through the 110-mm recorder module. The recorder receives data from the main control board and then transfers the data to the thermal print head to print the data. The working principles and module functions of the recorder as shown below. Function modules:

Figure2–8



Parameter Measurement System

The parameter measurement function is implemented by the BeneHeart N1 module. The system can perform measurement such as 3/5/12-lead ECG, SpO2, NIBP, RESP, Temp, IBP and CO2.

2.2.7 Electrode Base

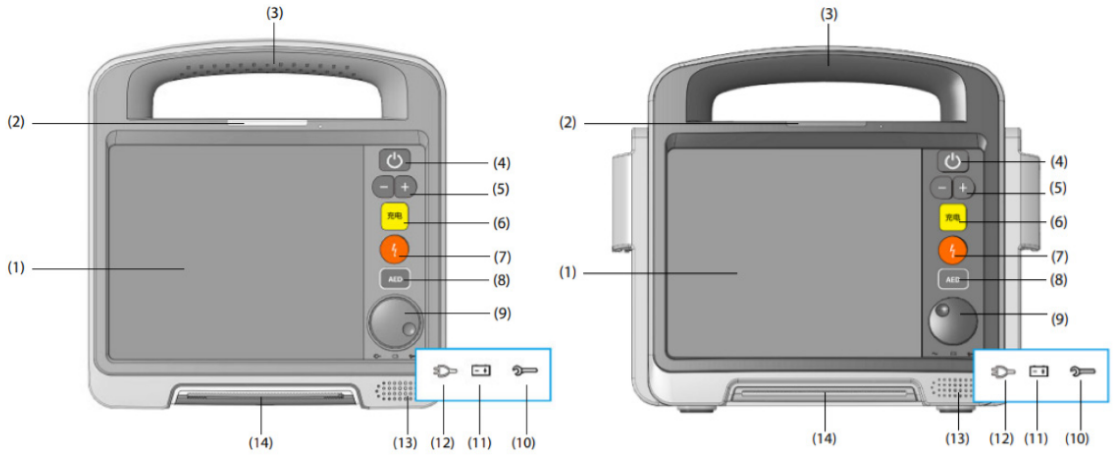
The electrode base holds paddles. The electrode base has a 50-ohm test load and an in-position detection switch. When the equipment runs self tests, test current will pass through the test load.

3 Installation

3.1 Ports on the Main Unit

Figure3–1

Front view



Pad configuration

Paddle configuration

Figure3–2

(1) Screen
(2) Alarm LED: When an alarm occurs, this alarm LED lights and flashes according to the alarm priority.
(3) Controller handle
(4) On/Off switch
- Power-on: After connecting to the power supply, press this key to turn on the equipment.
- Power-off: In the power-on state, press this key for 3s to turn off the equipment.

(5) Energy selection key
- In the power-on state, press this key to enter the manual defibrillation mode.
- In manual defibrillation mode, press this key to enter the energy selection mode.

(6) Charging key
- In the power-on state, press this key to enter the manual defibrillation mode.
- In manual defibrillation mode, press this key to enter the defibrillation energy charging mode.

(7) Electric shock key
- In the power-on state, press this key to enter the manual defibrillation mode.
- In AED or manual defibrillation mode, press this key to perform electric shock.

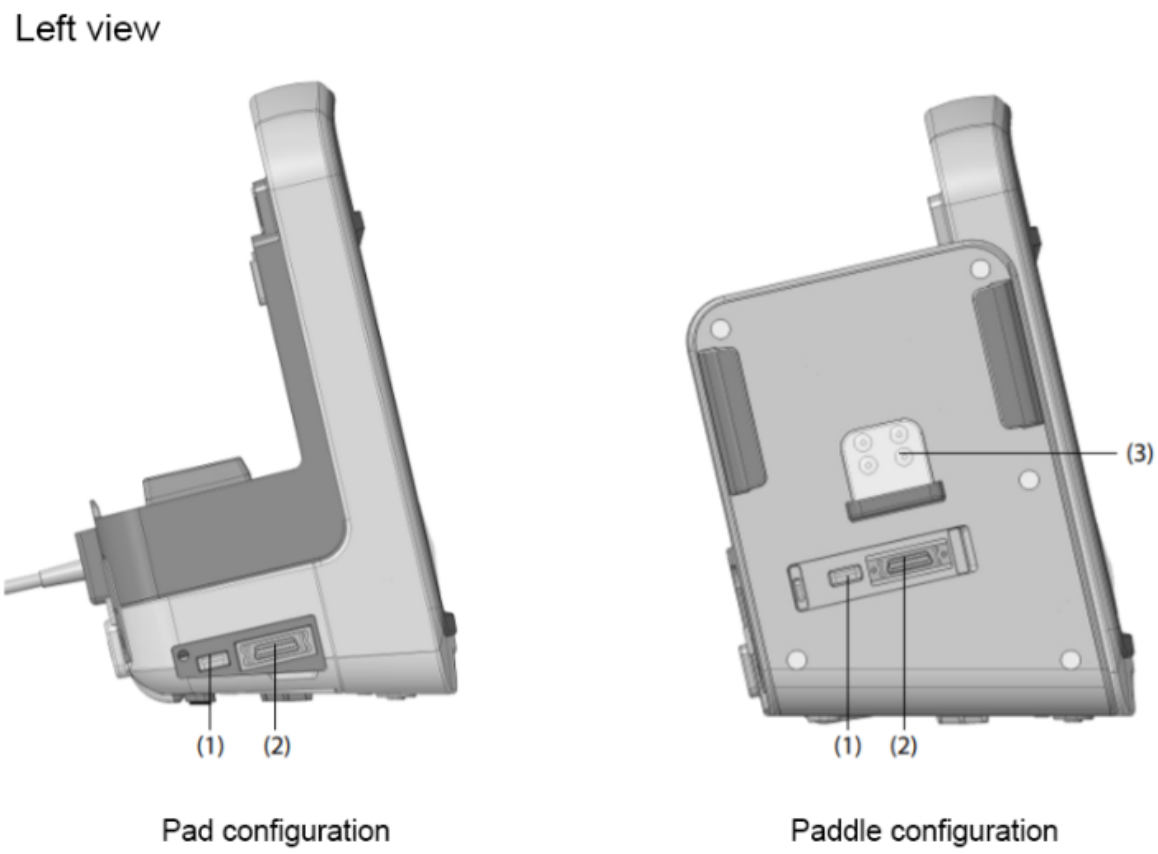
(8) AED key: In the power-on state, press this key to enter the AED mode.
(9) Knob: It is used for screen operation.
(10) Status indicator
- Steady on green
  - The equipment is connected to the external power supply and works properly.
  - The equipment is powered only by the battery. The equipment is powered on and works properly.
- Flashing green
  - The equipment is powered only by the battery. The equipment is powered off properly.
- Flashing red
  - Automatic detection failed or the equipment detects a fault.
  - The equipment is powered only by one battery. The battery level is low or the battery is faulty.
  - The equipment is powered only by two batteries. The battery level of both batteries is low or a battery is faulty.
  - The equipment is powered only by the external power supply. The "Battery Not in Position" is set to "Indicator On".
- Off: Not connected to the external power supply and battery.

(11) Battery indicator
- The yellow indicator is on: The battery is being charged.
- The green indicator is on: The battery is fully charged or the equipment is powered by battery.
- Off: The battery is not installed or the battery is faulty.

(12) Power indicator
- On: The external power supply is connected.
- Off: The external power supply is not connected.

(13) Speaker
(14) Recorder

Figure3–3



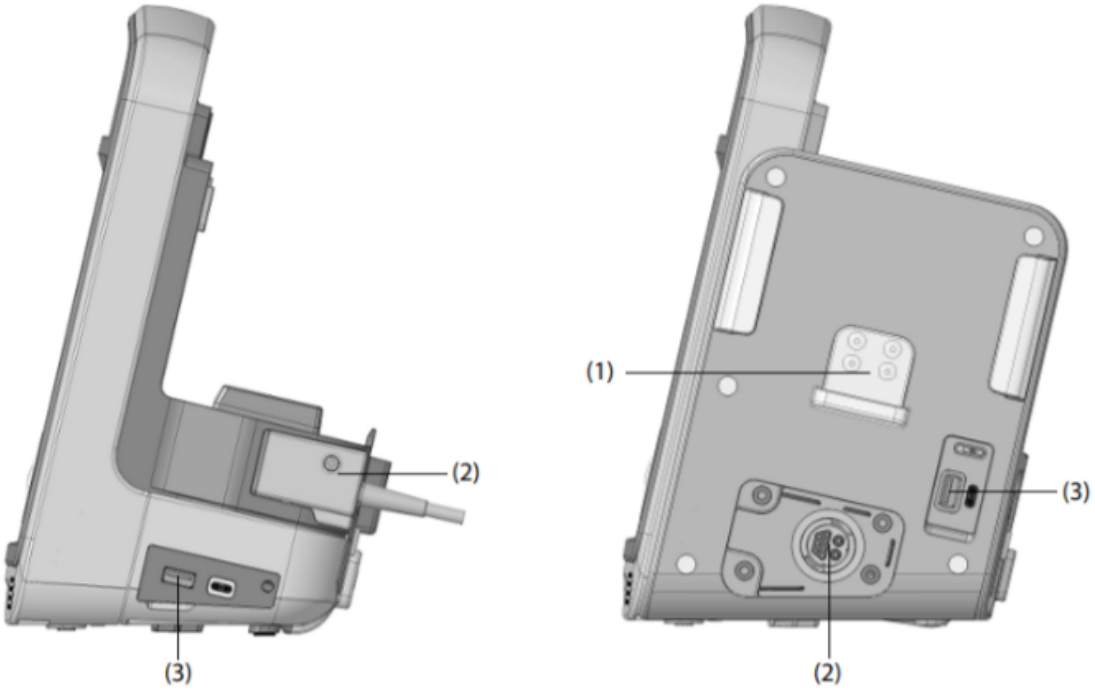
(1) USB 2.0 interface: Connect to the USB flash drive.

(2) Multi-functional interface: Connect to the CPR sensor, analog signal output cable or synchronized defibrillation input cable.

(3) Paddle base: Place the sternal pad.

Figure3–4

Right view



Pad configuration

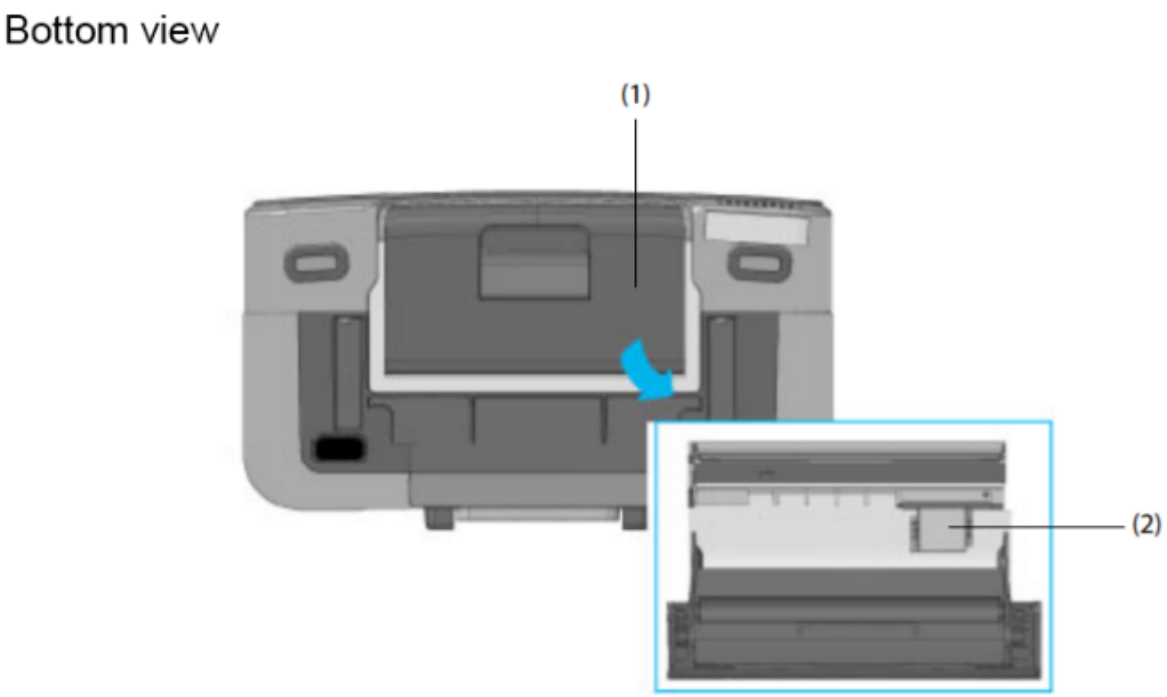
Paddle configuration

(1) Right paddle base: Place the apical paddle.

(2) Therapy socket: Therapy cable interface

(3) USB 3.0interface: Extended interface

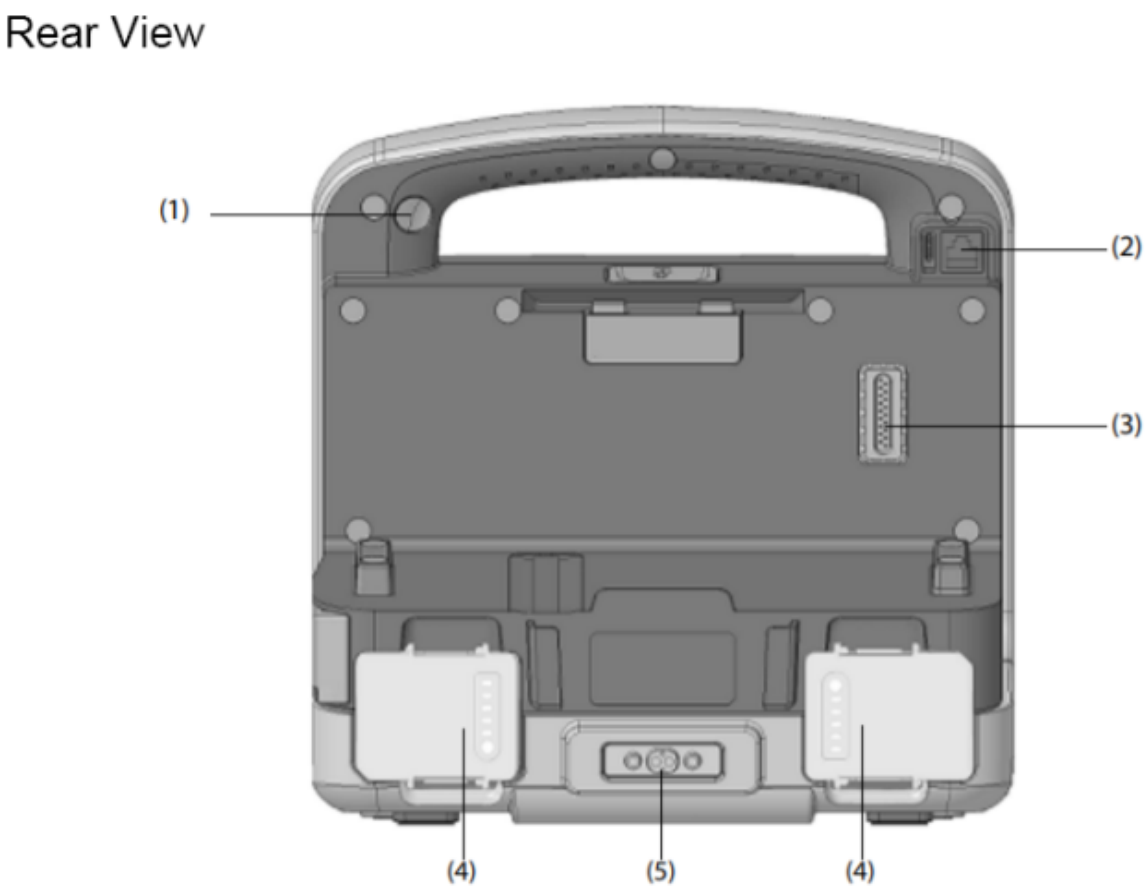
Figure3–5



(1) Recorder

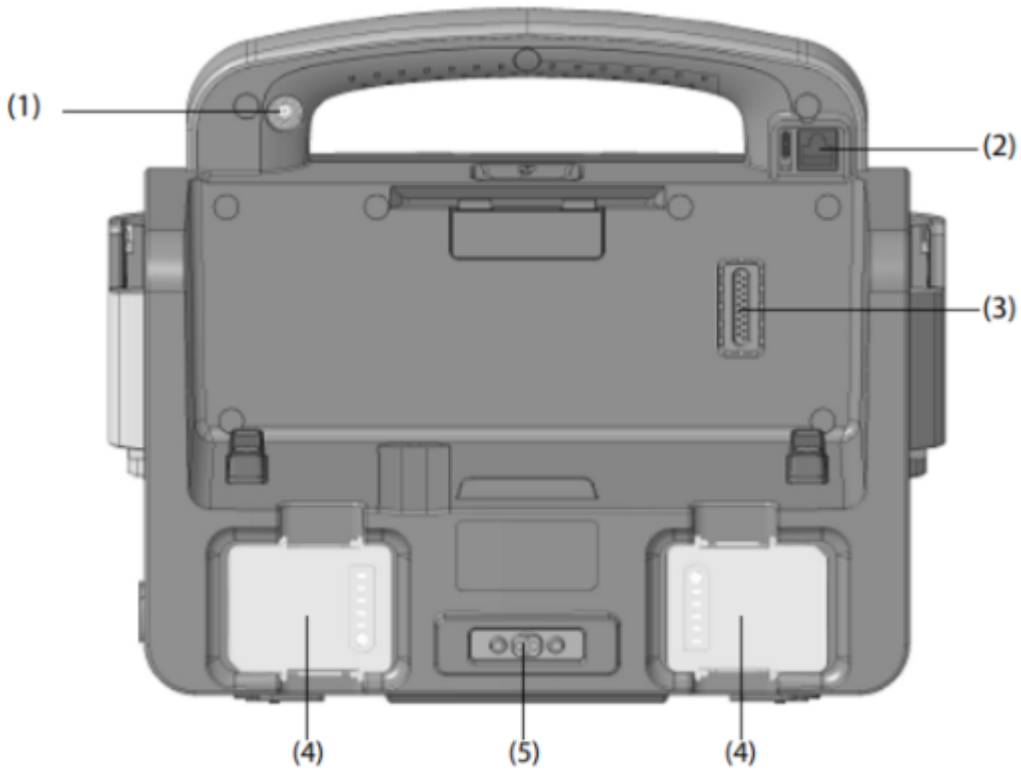
(2) Cellular mobile network interface: Connected to the

Figure3–6



Pad configuration

Figure3–7



Paddle configuration

(1) Camera: Take pictures of the emergency scene
(2) Network interface: Standard RJ45 interface
(3) Portable kit interface: Connect to the portable kit. For details, see 9.1.2 Portable Kit.
(4) Battery
(5) Power interface: Connect to the external power supply.

3.2 Preparations Before Installation

3.2.1 Space Requirements

Accessories and Tools

No special accessories are required for installation.

Tools

- Crosshead screwdriver
- Tweezers

- Needle nose pliers

Preparation for Installation Site

1. Ensure that the site meets all safety, environmental, and power requirements.
2. Check that required power sockets are available.
3. Check that a network connector is available if the defibrillator/monitor needs to be connected to network.

⚠WARNING

Only power cables provided with the system can be used. For reasons of safety, power (mains) extension cables or adapters shall not be used.

3.2.2 Environmental Requirements

⚠WARNING

To avoid explosion hazard, do not use the equipment in the presence of flammable anesthetics, vapors, or liquids.

⚠CAUTION

The environment where the defibrillator/monitor will be used should be reasonably free from vibration, dust and corrosive substances. If these conditions are not met, the accuracy of the system may be affected and damage may occur.

The environmental specification is as follows:

Operating Environment	
Operating temperature	–20°C to +55°C (When configured with ECG and manual defibrillation, without batteries) 0°C to 50°C (When configured with all functions)
Operating humidity	10% to 95%, non-condensing
Atmospheric pressure	57.0 kPa to 106.2 kPa (CO2 module: 57.3 kPa to 105.3 kPa)
Storage Environment	
Storage temperature	–40°C to +75°C
Storage humidity	5% to 95%, non-condensing
Storage atmospheric pressure	57.0 kPa to 106.2 kPa

3.2.3 Electrical Requirements

Check connection cables and power cable.

1. Check whether all system cables, the power plug and power cable are intact. Check whether pins of the power plug can move in the shell. If any cable or the power plug is damaged, do not use it.
2. Check the patient connection cable and leads to make sure their insulating layer is intact and connectors at both ends are securely connected.

WARNING

This machine must be connected to a power socket with protective earth contacts.

Power specifications:
Input voltage: 100-240 VAC (-15%, +10%)
Input current: 1.8 A to 0.8 A
Frequency: 50/60 Hz (±3 Hz)
DC power input
Input voltage: 18 VDC (±5%)
Input current: 7.2 A (max.)
AC power adapter and transfer base (AC power input)
Input voltage: 100-240 VAC (-15%, +10%)
Input current: 1.8-0.8 A
Frequency: 50/60 Hz (±3 Hz)
Transfer base (DC power input)
Input voltage: 12 VDC to 30.3 VDC (–15%, +25%)
Input current: 15.5 A to 6.5 A

3.3 Equipment Installation

3.3.1 Unpacking

Unpacking the Equipment

1. After receiving the product, check the packing box immediately for any damage.

1) If the packing box is not damaged, sign your name and date on the bill of lading or air waybill to indicate that the product has been received intact.

2) If the packing box is damaged, accept the product conditionally and describe the damage on the bill of lading or air waybill. Both the carrier and the consignee must sign their name and date on the bill of lading or air waybill. Keep all damaged factory packages until Mindray gives further instructions. The consignee should contact Mindray customer service department immediately.

2. Cut the transparent tape with scissors and open the packing box.
3. Take out the accessory box and foam.
4. Take out the main unit.
5. Open the accessory box and take out the accessories, including the battery, power cable, and ECG cable.

3.3.2 Preparations for Power-On

Before connecting the machine to a power outlet, make sure that:

- The voltage is within the range specified for the machine.
- A three-pin power cable and a three-pin power socket are used to ensure reliable grounding of the machine. Do not use a two-pin AC power cable or two-pin power socket.
- When the machine needs to be used with another medical device, its equipotential ground terminal is reliably connected to the equipotential ground terminal of this device.
- The machine is not placed below the perfusion bag or where liquid is dripping, lest liquid should intrude into the machine.
- To check the battery capacity, insert the battery into the battery slot until you hear a click. If the battery is equipped with a lock, fasten the lock to prevent the battery from bumping and falling in the ambulance. Connect the equipment to the power supply. The defibrillator monitor can only use the power adapter provided by Mindray.

3.3.3 Switch-on Guide

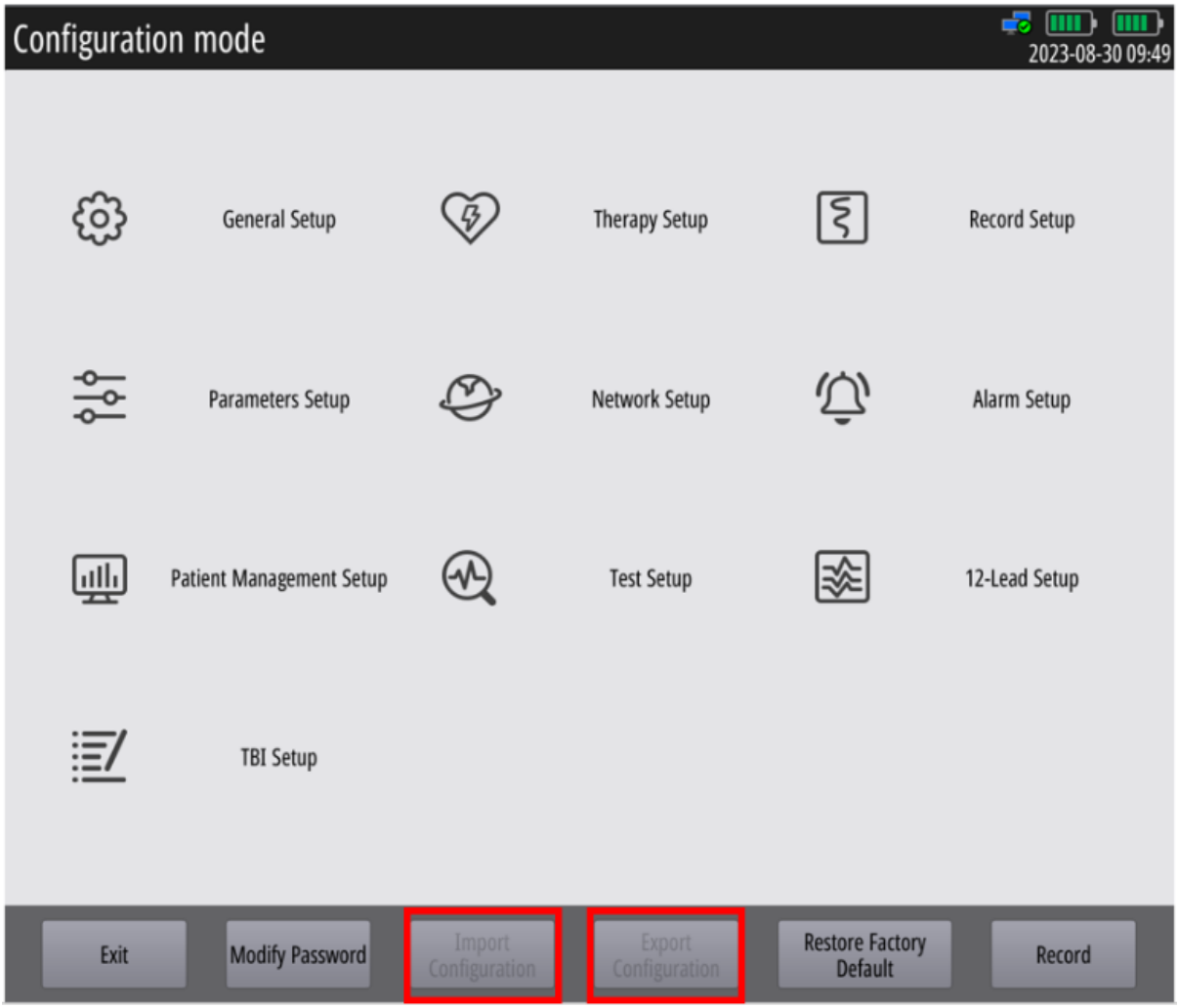
1. Check the indicators. The battery and power indicators are on. Press the unit switch. The equipment is turned on.
2. The equipment enters the installation wizard. If the equipment continues to be used in an emergency, you can click the emergency entry to skip the installation wizard. During the installation wizard process, you can choose to click the emergency entry to use the equipment at any time.
3. Click the installation wizard and set the language, time, and network in sequence. If you do not need to connect the equipment to the central monitoring system or the network environment has not been deployed, you can choose to skip this step. The equipment comes standard with a wired NIC. If the customer configures multiple network modules, it is recommended to select the automatic mode. When the current network is abnormal, the equipment can automatically switch to a network that is available.
4. Set the monitor name, hospital, bed No. and other information in More Settings.
5. In default boot mode, you can set the equipment to enter monitoring mode, manual defibrillation mode, and AED mode. You can also set the screen lock time, which is 5 minutes by default.
6. Connect the battery, paddle or test load according to the graphic guide (for the equipment configured with pads, it can only be connected to the test load).

7. After the accessories are connected, perform user test according to the graphic guide. If the user test fails, the reason for the self-test failure is displayed on the right side of the screen, and the user test will be processed again. The user test must pass during the installation process.
8. You can scan the QR code on the screen to get more services.
9. After you click Finish, the equipment restarts and the installation wizard ends.

3.3.4 Parameter settings

The installation wizard only guides the setting of some parameters. For more parameter settings, choose **Main Menu>Configuration** to enter the configuration mode and set the parameters.

Figure3–8



NOTICE

When equipment is installed in batches and uses the same configuration, you can use the configuration export and import functions to improve efficiency.

3.3.5 Installing the Accessories

For the installation of the corresponding accessories, see the instructions of the corresponding accessories.

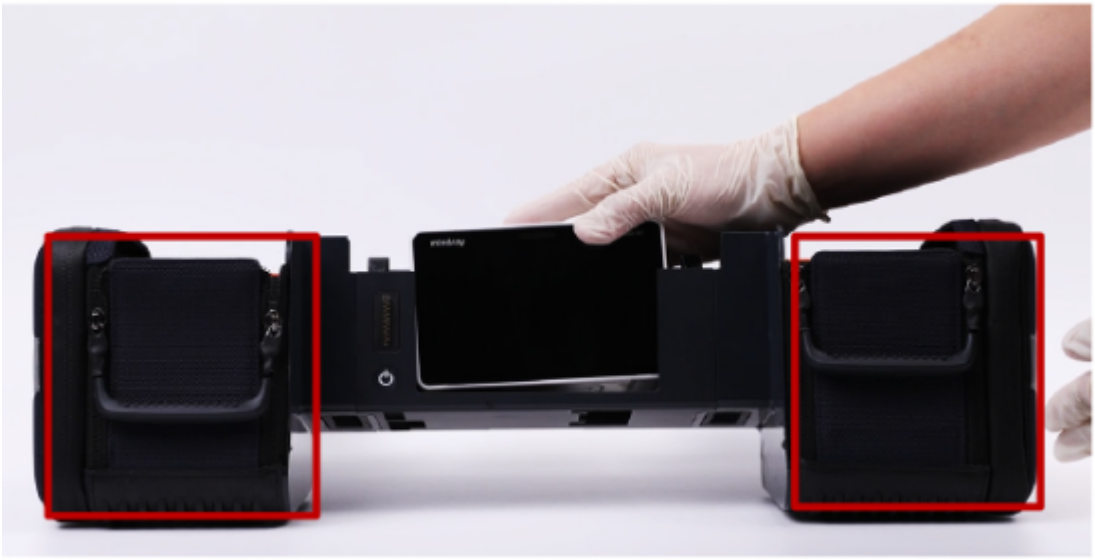
3.3.6 N1 Installation (Pad Version)

1. Press the two lock buttons on the front of the portable kit at the same time to open the top cover.

Figure3–9

2. Put the N1 into the slot of the accessory kit and close the top cover. The portable kits on both sides can be used to place accessories.

Figure3–10

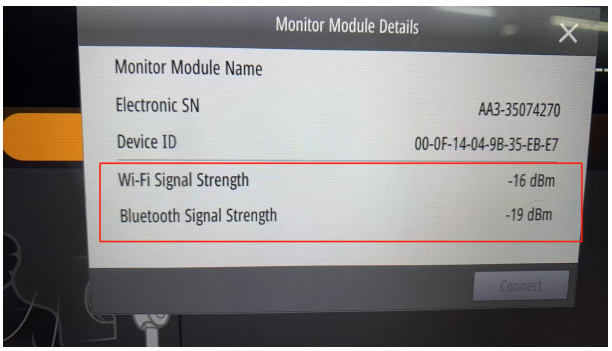


3. Put the N1 portable kit into the slot of the DX host, and the pairing will be completed automatically.

Figure3–11

4. Click the icon in the upper right corner of the DX screen to confirm WIFI signal strength and Bluetooth signal strength. (When the distance between DX and N1 is within 1 meter, it is necessary to ensure that the Wi-Fi and Bluetooth signal strengths are greater than -65dBm)

Figure3–12



3.3.7 Test After Installation

After installing the equipment, perform tests according to the following table.

No.	Test Item	Remarks
1	Visual Check	None
2	Power-on Test	None
3	User Test	None

4 Network Connection

4.1 Installing the WLAN

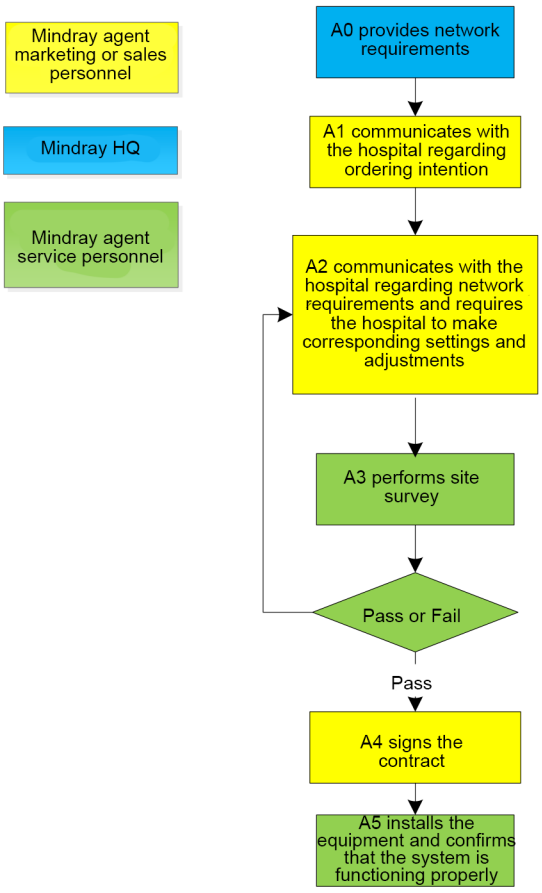
4.1.1 Introduction

This chapter describes how to install Mindray external defibrillation monitor using WLAN.

4.1.2 Network Deployment Procedure

If the hospital has an WLAN, the installation process is as follows:

Figure4–1 Network Deployment Flowchart

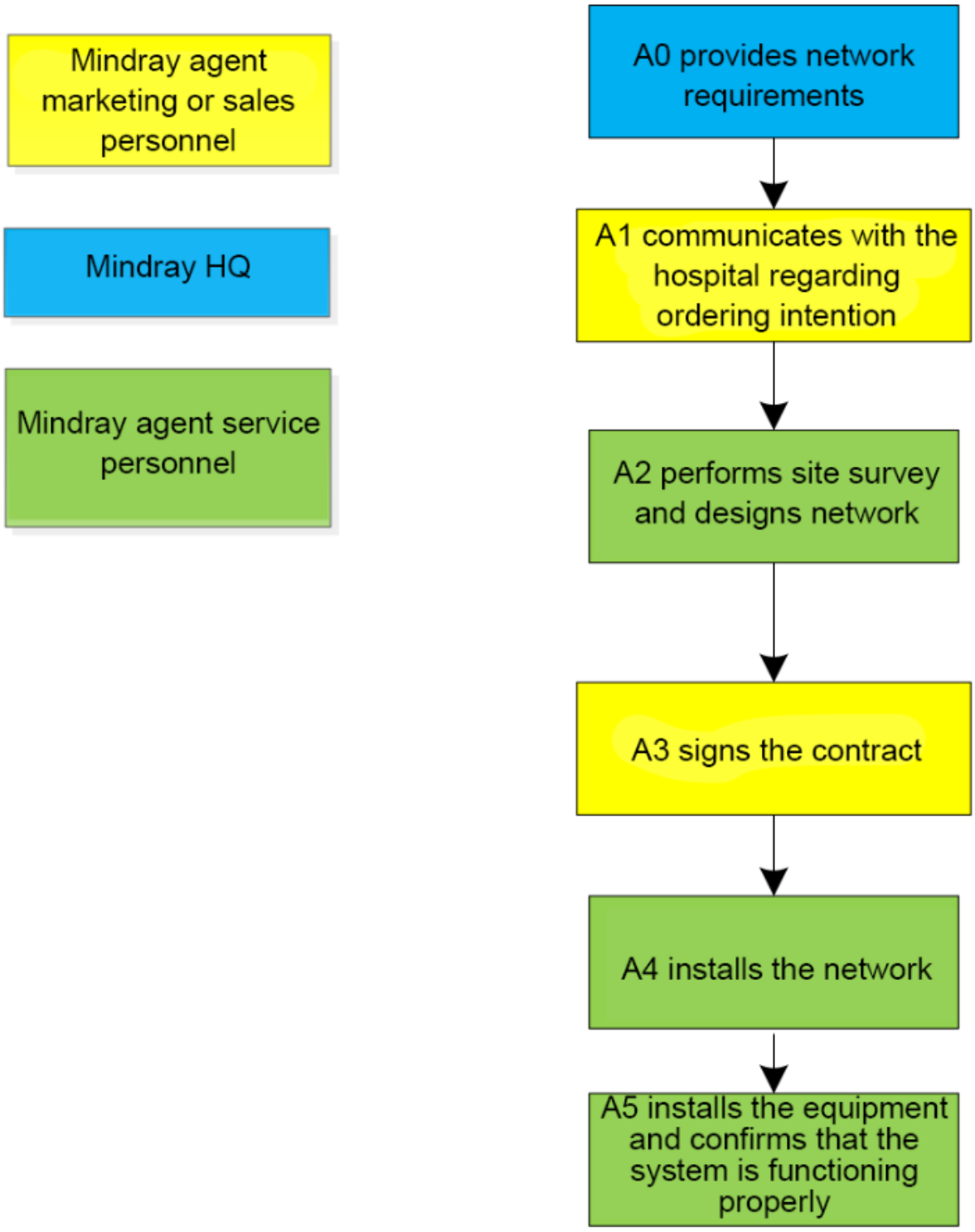


Output List

Operation	Output	Requirement	Template
A0	Wireless network requirements of Mindray external defibrillation monitor	Determine the wireless network deployment requirements of Mindray external defibrillation monitor.	Wireless network requirement form
A3	Network acceptance report	Through questionnaire investigation and measurement, check whether the customer network meets the requirements of Mindray external defibrillation monitor.	Wireless network acceptance form
A5	Installation confirmation report	Confirm the actual operation of Mindray external defibrillation monitor after installation.	External defibrillation monitor installation confirmation table

If the hospital plans to build a new WLAN for Mindray external defibrillation monitor, please ensure that there is at least one idle Wi-Fi channel. Otherwise, after the new WLAN is established, it cannot meet the requirements of Mindray external defibrillation monitor in terms of co-frequency interference. The installation process is as follows:

Figure4–2 New WLAN Installation Process



Operation	Output	Requirement	Template
A0	Wireless network requirements of Mindray external defibrillation monitor	Determine the wireless network deployment requirements of Mindray external defibrillation monitor.	Wireless network requirement form
A2	Network design documents and list of materials	/	/
A5	Installation confirmation report	Confirm the actual operation of Mindray external defibrillation monitor after installation.	External defibrillation monitor installation confirmation table

NOTICE

The network design and deployment project is very complicated and needs the help of professional IT engineers. This document does not contain these contents.

4.1.3 Network Requirements

Wireless networks need to meet the following requirements.

Table 4–1 Wireless network requirement form

No.	Item	Requirement
Wireless coverage requirements		
1	Wi-Fi coverage signal strength (RSSI)	-65 dBm RSSI is the value displayed on the external defibrillation monitor.
2	Co-channel interference	20 dB (the signal of co-channel interference AP is at least 20 dB lower than the signal of AP used by external defibrillation monitor)
3	Ping delay	The average delay of PC or mobile phone is less than 100

Table 4–1 Wireless network requirement form(continued)

No.	Item	Requirement
		ms, and the packet loss rate should be less than 1%.
AP capacity requirements		
1	AP capability	The expected number of devices connected to an AP must be less than 50% of the capacity of the AP. For example, in the coverage area of an AP, the number of devices connected to the AP is usually 16, so the nominal number of devices that can be connected to the AP at the same time must be greater than 32. The AP can create multiple SSID.
2	Device density	The maximum number of devices connected to an AP at the same time is 16, (including external defibrillation monitor (at most 3 devices) and other devices).
WLAN features		
1	AP channel width	Set the AP channel width to 20 MHz. Do not use HT40 or HT80.
2	802.11 protocol	WLAN cannot use protocols not supported by Mindray external defibrillation monitor, such as 802.11ac.
3	Safety Mode	WLAN cannot use safety modes not supported by Mindray external defibrillation monitor. WLAN cannot use safety modes not supported by

Table 4–1 Wireless network requirement form(continued)

No.	Item	Requirement
		Mindray external defibrillation monitor. WPA2-Enterprise or WPA2-PSK is recommended. Long password is recommended and should be modified frequently. If supported by the hospital network, WPA2-Enterprise can be used for higher security.
4	Private virtual LAN (VLAN)	The external defibrillation monitor needs to use a dedicated VLAN. Using VLAN can minimize broadcast or multicast data that may affect the stability of external defibrillation monitor.
Important settings		
1	DHCP	The DHCP server needs to reserve enough IP addresses to ensure that the external defibrillation monitor can obtain IP addresses.
2	IGMP snooping	If the external defibrillation monitor uses the multicast mode, the IGMP snooping function must be enabled.
3	Multicast	If the external defibrillation monitor uses the multicast mode, the network multicast function must be enabled.

Table 4–1 Wireless network requirement form(continued)

No.	Item	Requirement
4	Beacon and DTIM	AP DTIM = 1, Beacon = 100 ms
5	Service port	See Mindray External Defibrillation Monitor Network White Paper. The external defibrillation monitor network device is required to open some TCP/UDP ports.

4.1.4 Network acceptance

Tools and Resources

- Laptop with Windows 7 or later and wireless network card. It is recommended that the laptop be equipped with Intel Centrino wireless adapter. If your laptop is equipped with another wireless adapter, please ensure that the adapter has high accuracy.
- It is recommended to use professional network survey tools, such as Tamograph or Wirelessmon.
- Professional network engineer

NOTICE

Wi−Fi network survey personnel should be well trained in Wi−Fi. If there is no professional network engineer, please ask a third party for help.

Wi-Fi signal calibration

Before using the wireless network survey tool (running on the laptop) to test the network coverage, use the external defibrillation monitor to calibrate the RSSI of the wireless network survey tool according to the following steps.

1. Keep the external defibrillation monitor close to the wireless network survey tool. The distance between the external defibrillation monitor and wireless network survey tool is less than 30 cm, and the distance from human body is more than 50 cm. Move the external defibrillation monitor and wireless network survey tools at the same time (keep the previous distance).
2. When the external defibrillation monitor displays the following RSSI values: -50 dBm, -60 dBm, -70 dBm and -80 dBm, record the RSSI values read by the wireless network survey tool.
3. During field survey, calibrate the RSSI of the wireless network survey tool relative to the external defibrillation monitor (RSSI of the external defibrillation monitor is the criterion of wireless coverage).

Network acceptance procedure

Network acceptance can be done in two ways: First, complete the items that need self-inspection by the IT department of the hospital, as shown in the network acceptance form. Then, the service personnel or the authorized party conducts on-site tests to confirm the remaining contents, and finally fills the results in the network acceptance form. If any item found in the network acceptance do not meet the requirements, it should be adjusted before installing the external defibrillation monitor.

During the test, enable the broadcast function of the SSID of Wi-Fi network to ensure that the SSID of Wi-Fi can be scanned.

Table 4–2 Wireless network acceptance form

No.	Item	Requirement	Verification Method	Test Result
Wireless coverage requirements				
1	Received signal strength (RSSI)	≥ -65 dBm RSSI is the value displayed on the external defibrillation monitor.	Service personnel use network survey tools to perform tests. Ensure that all expected coverage areas (such as wards, corridors, toilets, stairs and elevators) are tested.	
2	Co-channel interference	-20 dB	Service personnel use network survey tools to perform tests. Ensure that all expected coverage areas (such as wards, corridors, toilets, stairs and elevators) are tested.	
3	Ping delay	The average delay of PC or mobile phone	Steps for service personnel to perform tests:	

Table 4–2 Wireless network acceptance form(continued)

No.	Item	Requirement	Verification Method	Test Result
		using a normal Wi-Fi module is less than 100 ms, and the packet loss rate should be less than 1%.	1. Connect a PC or mobile phone to an AP. 2. Connect another PC to the LAN port of the central monitoring system. 3. Run the command "ping –t –l 32 –w 1000 IP address-of -cellphone" for 10 minutes. 4. Run the command "ctrl +c".	
AP capacity requirements				
1	AP capability	The expected number of devices connected to an AP must be less than 50% of the capacity of the AP. For example, in the coverage area of an AP, the number of devices connected to the AP is usually 16, so the nominal number of devices that can	Service personnel obtain AP model from relevant hospital personnel or through direct observation. Get the AP data sheet according to the model to confirm the AP's related capabilities.	

Table 4–2 Wireless network acceptance form(continued)

No.	Item	Requirement	Verification Method	Test Result
		be connected to the AP at the same time must be greater than 32. The AP can create multiple SSID.		
2	Device density	The maximum number of devices connected to an AP at the same time is 16 (including external defibrillation monitor (at most 3 devices) and other devices).	Check with the hospital IT whether this requirement is met.	
WLAN features				
1	AP channel width	Set the channel width to 20 MHz. Do not use HT40 or HT80.	Check with the hospital IT whether this requirement is met.	
2	802.11 protocol	WLAN cannot use protocols not supported by Mindray external defibrillation monitor, such as 802.11ac.	Check with the hospital IT whether this requirement is met.	
3	Safety Mode	WLAN cannot use safety modes not supported by Mindray external	Check with the hospital IT whether this requirement is met.	

Table 4–2 Wireless network acceptance form(continued)

No.	Item	Requirement	Verification Method	Test Result
		defibrillation monitor. WPA2-Enterprise or WPA2-PSK is recommended. Long password is recommended and should be modified frequently. If supported by the hospital network, WPA2-Enterprise can be used for higher security.		
4	Private virtual LAN (VLAN)	The external defibrillation monitor needs to use a dedicated VLAN. Using VLAN can minimize broadcast or multicast data that may affect the stability of external defibrillation monitor.	Check with the hospital IT whether this requirement is met.	
Important settings				
1	DHCP	The DHCP server needs to reserve enough IP addresses to ensure that the external	Check with the hospital IT whether this requirement is met.	

Table 4–2 Wireless network acceptance form(continued)

No.	Item	Requirement	Verification Method	Test Result
		defibrillation monitor can obtain IP addresses.		
2	IGMP snooping	If the external defibrillation monitor uses the multicast mode, the IGMP snooping function must be enabled.	Check with the hospital IT whether this requirement is met.	
3	Multicast	If the external defibrillation monitor uses the multicast mode, the network multicast function must be enabled.	Check with the hospital IT whether this requirement is met.	
4	Beacon and DTIM	AP DTIM = 1, Beacon = 100 ms	Check with the hospital IT whether this requirement is met.	
5	Service port	See Mindray External Defibrillation Monitor Network White Paper. The external defibrillation monitor is required to open some TCP/UDP ports.	Check with the hospital IT whether this requirement is met.	

4.1.5 Evaluating the Network Coverage

To confirm the coverage effect, perform the coverage test in the areas that patients often visit. Check whether the coverage meets the requirements by observing the signal strength (RSSI) displayed on the external defibrillation monitor and whether disconnection events occur.
If necessary, adjust the position of AP or add APs to ensure the coverage effect.
Follow these steps:

1. Set the external defibrillation monitor to access the central monitoring system.
2. Run the Ping command to the external defibrillation monitor on the central monitoring system (enter "ping -t -l 32 -w 1500 IP address" in the CLI window) (continue to run the Ping command to the external defibrillation monitor. The data packet length is 32 bytes, and the reply timeout is 1500 ms). Enter "ctrl + c" to enter the Ping command 10 minutes later. The average delay of PC or mobile phone is less than 250 ms, and the packet loss rate should be less than 1%.
3. Hold the external defibrillation monitor to avoid personnel blocking. Walk around the expected coverage areas (such as all corners of wards, toilets, smoking areas, corridors, and elevators).
4. The times of disconnection from the CMS should be less than 10% of the roaming times of the external defibrillation monitor, and the RSSI value displayed on the external defibrillation monitor should not be less than -65 dBm.
5. If the signal strength is lower than -65 dBm during walking, stop at this position and observe for 30s. If the RSSI value is not lower than -65 dBm for more than 66% of the time, the coverage requirement is met.

Table 4–3 External defibrillation monitor installation confirmation table

Test or observation items	Results (Pass, Fail or N/A)
Ping the external defibrillation monitor from the central monitoring system to ensure that the average delay is less than 250 ms and the packet loss rate should be less than 1%.	
Hold the external defibrillation monitor to move around in different AP ranges. After walking through the whole expected coverage area, observe the continuous waveform on the central monitoring system. The disconnection event time should be less than 10% of the external defibrillation monitor roaming time.	
In the position with the worst coverage effect, the signal strength displayed on the screen is higher than -65 dBm.	

NOTICE

If the evaluation monitor is only used permanently and will not roam between APs, it is not necessary to perform the walking test in the coverage area, but only need to place the monitor in the poorest signal position to confirm the signal strength and ping effect.

4.1.6 Recommended network devices

It is recommended to use the Cisco devices listed in the table below.

Device	Part No.
2500 wireless controller	AIR-CT2504-x-K9 or C9800-L-C-K9
2600 wireless access point	AIR-CAP2602I-x-K9 or C9120AXI-H

4.1.7 WLAN Parameter Settings

Configure the WLAN parameters of the external defibrillation monitor according to the following table:

Parameter	Recommended settings	Description
Main Menu >Configuration > Network Setup> WLAN		
Add WLAN	/	Add the required WLAN and set WLAN parameters in the pop-up menu.
Main Menu> Configuration > Network Setup> WLAN> Add WLAN> WLAN		
Name	Set the WLAN name	/
SSID	Set the actual network name used	/
Security	WPA2-PSK	It should be the same as the safety mode of the WLAN deployed for the external defibrillation monitor. If EAP is adopted, the safety mode is selected according to the WLAN deployment.
Security Key	Set the actual network password used	/
Main Menu >Configuration >Network Setup >WLAN> Add WLAN> WLAN Setup		

Parameter	Recommended settings	Description
WLAN Band	5G	Options are 2.4G, 5G, and Auto. 2.4G = Only use the 2.4 GHz band 5G = Only use the 5GHz band Auto = Use the 2.4 GHz band or 5 GHz band (5 GHz band preferred)
2.4G channel	Specified	Options are All, Specified, and None. The stability and roaming performance can be improved by limiting the channels to which the monitor can connect to a small number. For example, on a 2.4 GHz network, if the channel is set to 1, 6 and 11, the network card will not scan or connect to other channels. The 2.4G channel setting on the external defibrillation monitor must match the AP channel setting.
5G channel	Specified	Options are All, Specified, and None. The stability and roaming performance can be improved by limiting the channels to which the monitor can connect to a small number. The 5G channel setting on the external defibrillation monitor must match the WLAN AP channel setting.
Main Menu >Configuration >Network Setup >WLAN >Certificate Management		
Local	/	Display the existing EAP certificate in the external defibrillation monitor

Parameter	Recommended settings	Description
USB drive	/	Display the existing EAP certificate in the USB drive
Main Menu >Maintenance >Factory Maintenance> Setup> WLAN Setup		
Wireless Regulatory Area	/	Select the corresponding country or region. If unavailable, select Custom.
Trigger	-70	When the RSSI is lower than the roaming trigger value, the network card will try to roam.

The safety modes supported by the monitor are as follows:

Menu	Basic algorithm	Authentication mode
WPA-PSK	WPA	PSK
WPA-TKIP	WPA	EAP
WPA-PSK-AES	WPA	PSK
WPA2-PSK	WPA2	PSK
WPA-AES	WPA	EAP
WPA2-AES	WPA2	EAP

After EAP is selected, the system will display the corresponding configuration items. The following table lists the configuration items for different EAP methods.

EAP mode	Identity	Password	CA certificate	User certificate	Anonymous
PEAP-MsChapV2	Mandatory	Mandatory	Optional	Unnecessary	Support
EAP-TLS	Mandatory (no verification)	Unnecessary	Optional	Mandatory	Unsupported
EAP-TTLS	Mandatory	Mandatory	Optional	Unnecessary	Support

NOTICE

EAP-TLS forces authentication of identity information in Windows NPS servers and must be used correctly.

The meaning of each configuration item is shown below:

- Identity: User identity, which is the user name in AD, LDAP or local user management on the RADIUS server.

- Anonymous: This item does not affect the authentication process. The function of this item is to hide the real name (identity).
- Password: The password of the identity.
- CA certificate: Select the CA certificate from the imported certificates.
- User certificate: Select the user certificate from the imported certificates.

4.1.8 Troubleshooting

Symptom	Possible Causes	Recommended Action
The external defibrillation monitor cannot connect to the AP, and an X is displayed on the external defibrillation monitor's Wi-Fi signal icon.	The nearby AP is not turned on.	Ensure that the AP is turned on and belongs to the VLAN where the external defibrillation monitor is located.
	The external defibrillation monitor is not turned on in the AP coverage area.	Walk to the AP coverage area and turn on the external defibrillation monitor. Ensure that the signal strength displayed on the external defibrillation monitor is greater than -65 dBm. Ensure that the co-frequency interference meets the requirements.
	The SSID, IP address acquisition mode, and security mode are not correctly configured on the external defibrillation monitor.	Refer to this manual to reconfigure the information.
	The external defibrillation monitor is faulty.	Check if another external defibrillation monitor can be connected. If yes, restart the external defibrillation monitor and ensure that the configurations of the two external defibrillation monitors are the same. If the external defibrillation monitor still cannot be connected, return the external defibrillation monitor to Mindray for repair.

Symptom	Possible Causes	Recommended Action
The external defibrillation monitor can be connected to the AP, but it cannot be connected to the central monitoring system.	The external defibrillation monitor has not obtained permission to access the central monitoring system.	Allow the external defibrillation monitor to access the central monitoring system.
	The external defibrillation monitor cannot obtain any IP addresses, and the IP addresses in the IP address pool on the DHCP server have been used up.	Enable other network devices to connect to the central monitoring system to see if you can obtain an IP address. If the problem persists, contact the IT department.
	A static IP address conflict occurred.	Check whether a prompt indicating an IP address conflict is displayed on the external defibrillation monitor. If yes, ensure that all network devices have unique IP addresses.
	The network link is down.	Check whether the central monitoring system can be pinged after the PC or mobile phone is connected to the AP. If the problem persists, contact the IT department.
	The service port required by the external defibrillation monitor is not enabled on the hospital network.	Check whether the service port required by the external defibrillation monitor is enabled on the hospital network. If not, enable the function (such as some UDP ports and multicast function). If the problem persists, contact the IT department.
Intermittent disconnection of a single external defibrillation monitor occurred.	The external defibrillation monitor moves to the coverage blind area.	Check whether the Wi-Fi signal strength in the location of the disconnection is greater than -65 dBm.
	The external defibrillation monitor is faulty.	Check whether the external defibrillation monitor is easily disconnected at the same

Symptom	Possible Causes	Recommended Action
		location. If the problem persists after restarting the external defibrillation monitor, return the external defibrillation monitor to Mindray for repair.
	A static IP address conflict occurred.	Check whether a prompt indicating an IP address conflict is displayed on the external defibrillation monitor. Check whether one IP address is assigned to multiple devices.
Intermittent disconnection of multiple defibrillation monitors occurred.	APs in some areas are damaged.	Ensure that the AP is turned on and operating normally.
	The interference is strong in some areas.	Use network survey tools to check whether the interference is strong, and remove obvious sources of interference or adjust the WLAN deployment to meet Mindray's requirements.
	Signal coverage in some areas is insufficient.	Use network survey tools to check the signal coverage. If the signal coverage is insufficient in a certain area, adjust the location of the AP or add APs.
Intermittent disconnection of all external defibrillation monitors occurred.	The wired network is incorrectly configured.	Use a wired external defibrillation monitor to view the wired network configuration. Ensure that the WLAN bandwidth configured on the switch is sufficient, with a 50% surplus

Symptom	Possible Causes	Recommended Action
	There is radio interference.	Use network survey tools to check whether there is radio interference, and remove obvious sources of interference or adjust WLAN deployment to meet Mindray's requirements.

4.2 Cellular Network (4G/5G) Installation

4.2.1 Introduction

This chapter introduces how to install the Mindray external defibrillation monitor that uses cellular mobile networks (4G/5G). It transmits data to the cloud or local server through the 4G/5G cellular network. Users can view patient data (including physiological parameters, waveforms, etc.) on the central monitoring system (PC and mobile terminal), and perform remote diagnosis and on-site emergency therapy for patients, thereby improving work efficiency.

4.2.2 Connection to the Central Monitoring System

Connection Preparations

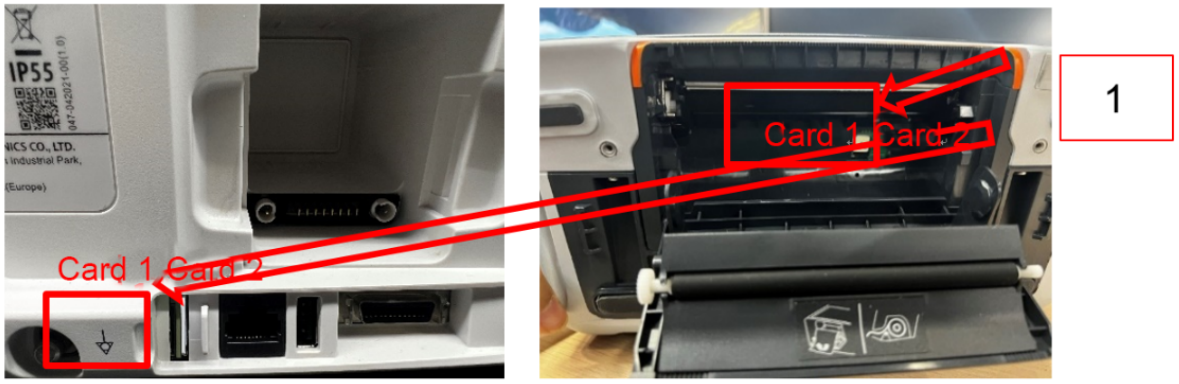
Prepare the following for establishing the connection to the central monitoring system:

1. MicroSIM card (purchase independently from China Mobile/China Unicom/China Telecom)
2. External defibrillation monitor
3. Central monitoring system (fixed IP address of the public network)

Procedures

1. Shut down the external defibrillation monitor. Open the recorder compartment door (D60/DX) at the bottom of the external defibrillator monitor or the rear bottom plug (D30) of the external defibrillator monitor, and select the MicroSIM card interface according to the silkscreen instructions (there are one SIM card interface on the left and right respectively)).
2. Insert the 4G/5G MicroSIM card.

Figure4–3



1 There is one card slot on the left and right respectively, supporting up to two 4G/5G MicroSIM cards.

3. Set the external defibrillation monitor

1) Choose **Main Menu**→**Configuration**→Enter the password→**Network Setup**→**General Setup**→**Network Type**.

2) Choose **Auto** or **Mobile Network**.

3) Select **Mobile Network**:

- For 5G configuration, select **Enable 5G Signal**, and select **On** or **Off**. By default, it is set to **On**.

  — When On is selected and a 4G card is inserted into the 5G device, the device still uses the 4G network. When a 5G card is inserted into the 5G device but the 5G signal is weak, the device automatically switches to the 4G network.

  — When Off is selected, no matter whether a 5G card or a 4G card is inserted into the 5G device, the device can only access the 4G network.

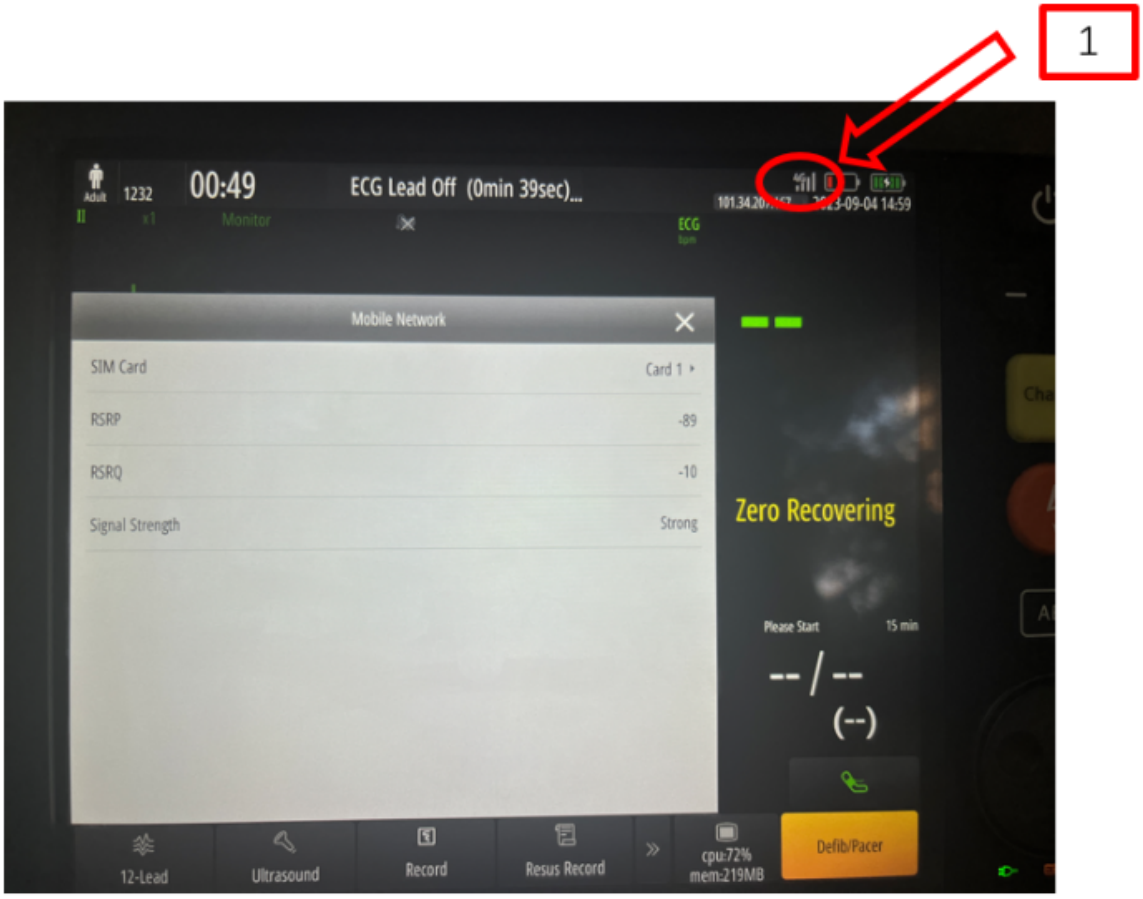
- Select the "SIM card slot" where the SIM card is inserted, which is card 1 or card 2.
- If access to the carrier network (usually an overseas carrier) requires APN, configure **APN Name**, **APN User Name** and **APN Password**.

4. Set the central monitoring system
   Choose **Main Menu**→**Configuration**→Enter the password→**Network Setup**→**Central Monitoring System**. Enter the name of the central monitoring system, department and server address (it must be a fixed IP address on the public network), and click Connection Test to check the network connectivity.
5. Network connection confirmation

1) Restart the external defibrillation monitor. When the defibrillation monitor is on, click the signal icon to observe the real-time signal strength, and manually switch to **Card 1** or **Card 2**

according to the network environment. It takes about 1 minute for the 4G/5G cellular mobile network to initialize and connect to the central monitoring system.

Figure4–4



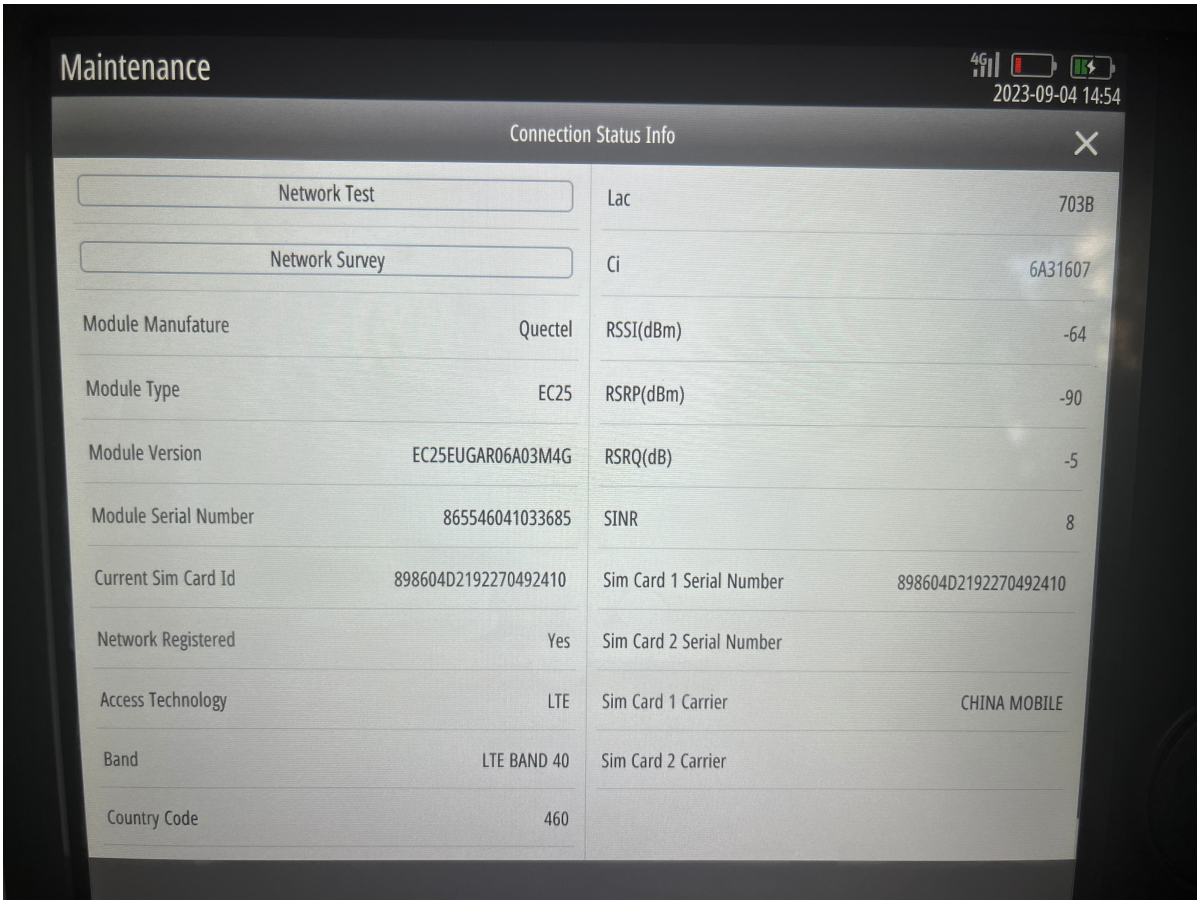
1 Click the 4G/5G signal icon to pop up the **Mobile Network** connection status, including the SIM card of the network application, RSRP, RSRQ, and signal strength. (Note: RSRP should be no less than -95 dBm.)

2) When the data from the monitor is displayed on the central monitoring system, it means that the network connection is successfully established.

Network diagnosis

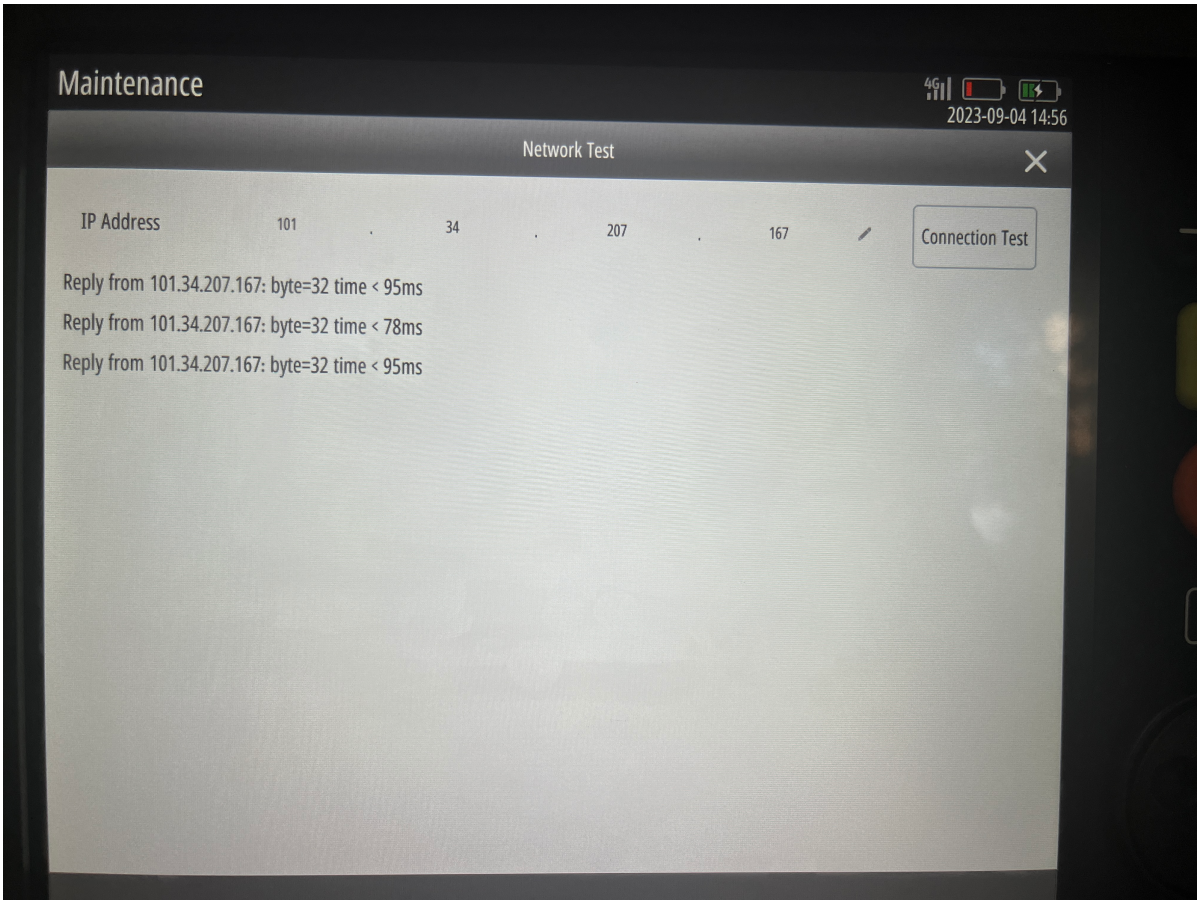
1. Choose **Main Menu**→**Maintenance**→Enter the factory maintenance password→**Factory Maintenance**→**Setup**→**Mobile Network**. View the connection status information. Check whether the module information, SIM card information, and network connection status information meet the installation requirements.

Figure4–5



2. Enter **Network Test**, enter the IP address of the central monitoring system, and click Network Test to diagnose network delay.

Figure4–6



3. Enter **Network Survey**. The screen can summarize and display the RSRP signal strength of external defibrillation monitor in the current period. Evaluate the stability of the network environment.

4.2.3 Network Environment Survey

When the external defibrillation monitor needs to be placed in a fixed position for a long time to transmit data with the central monitoring system, the cellular mobile network environment needs to be surveyed to ensure that the network signal status is stable and good.

Survey with mobile phone

When using a mobile phone to conduct network surveys, pay attention to the following requirements:

- Carrier: The SIM card network used for mobile phone signal survey must be consistent with that used by the hospital.
- Data network: NR or 5G is displayed under the 5G network, and LTE or 4G is displayed under the 4G network. When the mobile phone supports 5G network and the 5G network settings are turned on:

— If LTE/4G is displayed, the 5G network is not connected and the 4G network is connected at this time.

— If NR/5G is displayed, the 5G network is connected.

- RSRP: Select the "SS RSRP" tab to check the signal strength of the current network status. The signal strength represented by the RSRP range is shown in the table below:

RSRP range	Description
RSSI ≥ -85 dBm	The network is good and the 4G/5G network module works properly.
-95 dBm ≤ RSRP ≤ -85 dBm	There are certain risks in the network, and an external defibrillator monitor is required for network connection confirmation.
RSRP ≤ -95 dBm	The network is very poor and does not meet the working conditions of the 4G/5G network module. The carrier needs to optimize the network.

Using the Android mobile phone

Download "Cellular-Z" for free from your mobile phone's App Store.

Figure4–7

Using the iPhone

Charges may be required for mobile phone survey app in the App Store. It is recommended that you use your iPhone to dial
"*3001#12345#*" to check the signal strength in the background.
RSRP indicates the signal strength. You need to pay attention to the carrier and the current network system.

Figure4–8

4.2.4 4G/5G Traffic Usage

- Standby including sending the self-test report: 1 MB/1 day.
- 3/5-lead ECG monitoring report sent to the central monitoring system: about 200 MB/1 hour.
- 12-lead ECG monitoring report sent to the central monitoring system: about 300 MB/1 hour.
- Event reports, such as ultrasound reports and images: about 2 MB/1 time.

4.2.5 Troubleshooting

Symptom	Possible Causes	Recommended Action
The system prompts that the SIM card is not connected.	The SIM card connector and module cable are not connected properly.	Disassemble the front and rear shells and check whether the SIM card slot cable is inserted in place.
The external defibrillation monitor cannot be connected to the central monitoring system.	1. The monitor version/ settings do not meet requirements. 2. The SIM card account is in arrears. 3. The cellular network signal is too weak.	1. Choose **Factory Maintenance>Setup>Mobile Network**. Check the 4G/5G module and SIM card information. If the module and SIM card information can be read, there is no problem with the module communication. The monitor or central monitoring system may not be set as required. 2. Whether the SIM card account is in arrears shall be confirmed by the hospital. 3. Use survey software to confirm whether the cellular network signal strength is above -95 dBm. 1) If it is above -95 dBm, compare the signal strength difference between the survey software and the external defibrillation monitor. If the difference is more than 10 dB, check whether the antenna of the 4G/5G module is abnormal. 2) If it is not above -95 dBm, communicate with the hospital to change

Symptom	Possible Causes	Recommended Action
		the placement of the external defibrillator monitor or ask the carrier to optimize the network.
The central monitoring system is occasionally disconnected from the network.	The cellular network signal is too weak.	Use survey software to confirm whether the cellular network signal strength is above -95 dBm. 1. If it is above -95 dBm, compare the signal strength difference between the survey software and the external defibrillation monitor. If the difference is more than 10 dB, check the antenna connection status of the 4G/5G module. 2. If it is not above -95 dBm, communicate with the hospital to change the placement of the external defibrillator monitor or ask the carrier to optimize the network.

5 Maintenance

5.1 Maintenance Overview

5.1.1 Introduction

To ensure that the equipment always functions normally, qualified service personnel should perform regular inspection, maintenance, and test. This chapter provides a checklist of the testing procedures for the equipment with recommended test equipment and frequency. The service personnel should perform the testing and maintenance procedures as required and use appropriate test equipment. The testing procedures provided in this chapter are intended to verify that the equipment meets the performance specifications. If the equipment or a module fails to perform as specified in any test, repair or replacement must be done to correct the problem. If the problem persists, contact our Customer Service Department.

⚠ CAUTION

- **All tests should be performed by qualified service personnel only.**
- **Care should be taken to change the settings in Settings and Maintenance and Configuration menus to avoid loss of data.**
- **Before testing, service personnel should acquaint themselves with the test tools and make sure that test tools and cables are applicable.**
- **When testing monitoring parameters, move the Mode Select knob to Monitor to access the Monitor Mode.**
- **When performing therapy function tests, move the Mode Select knob to corresponding mode.**

5.1.2 Test Report

After completing the tests, service personnel can record test results as instructed in the Maintenance and Test Report at the end of this chapter and send the report to our Customer Service Department.

5.1.3 Recommended Frequencies

Inspection/Maintenance Item		Frequency
Visual Check		1. When the machine is installed for the first time or every time it is reinstalled
Power-on Test		1. When the machine is installed for the first time or every time it is reinstalled 2. Following any repair or parts replacement for the main unit
User Test		1. When the machine is installed for the first time or every time it is reinstalled 2. Following any repair or parts replacement for the main unit
Recorder test		1. When the recorder is repaired or replaced 2. Once every year
Manual Defibrillation Test	Charge/Discharge	1. After unpacking 2. When you suspect that the therapy function does not work properly 3. Once every year
	Energy release	
	Synchronized defibrillation	
Cardiac Pacing Test		1. When the functional module is repaired or replaced 2. Once every year
ECG test	Performance test	1. When you suspect that the measured values are inaccurate 2. When the ECG module is repaired or replaced 3. Once every year
	Module calibration	
Resp test		
SpO_2 test		
NIBP Test	Pressure calibration	
	Leakage test	
	Overvoltage protection test	
TEMP test		
IBP Test	Performance test	

Inspection/Maintenance Item		Frequency
	Pressure Calibration	
Sidestream CO_2 test	Leakage test	
	Performance test	
	Module calibration	
IR Ear TEMP Test		
Camera Test		
Ultrasound Test		
Impedance measurement test		1. When you suspect that the measured impedance values are inaccurate 2. When the therapy module is replaced 3. Once every year
Electrical Safety Test	Shell leakage current test	1. When the power module is repaired or replaced 2. Once every year
	Earth leakage current	
	Patient leakage current	
	Patient auxiliary current	

5.2 Visual Check

5.2.1 Visual Check

Inspect the equipment for obvious signs of physical damage. The test is passed if the equipment has no obvious signs of physical damage. Follow these guidelines when inspecting the equipment:

- Carefully inspect the shell, the display, and the buttons for physical damage.
- Inspect accessories for signs of damage.
- Inspect all external connections for loose connectors, bent pins, or frayed cables.
- Inspect all connectors on the equipment for loose connectors or bent pins.
- Make sure that safety labels and nameplates on the equipment are clearly legible.

5.3 Power-on Test

5.3.1 Power-on Test

This test is to verify that the defibrillator/ monitor can power on normally. The test is passed if the defibrillator/ monitor starts up by following this procedure:

1. Places paddles (if used) on the electrode base properly. Insert the battery to the equipment and connect the equipment to the AC power supply. The AC power indicator and battery indicator light up.
2. Press the power button and check whether the equipment can pass self-test and start.
3. Check the battery capacity icon in the technical alarm area and information area and in the upper right corner to check whether the equipment is normal. If a failure occurs during power-on self-test, the status indicator flashes in red.

5.4 User Test

5.4.1 User Test

Follow this procedure to perform user test:

1. If you use external paddles, place them on the electrode base; if you use a pads cable, connect it to the 50 Ω test load.
2. Insert the battery into the equipment. Connect the AC mains if no battery is available.
3. Choose **Main Menu>Common>User test**.
4. Perform operation as instructed. When the test ends, the system displays the test report. Click **Record** to print the results of the current test. Check whether the equipment is normal based on the test results. If the test failed, the status indicator flashes in red and the system prompts **Last User Test Failed** upon next power-on. If the user test fails or the system keeps prompting **Therapy cable not connected** during the test, check whether the status of the paddles and pads cable.

5.5 Preventative Maintenance

5.5.1 Recorder Test

Perform the following steps:

1. Enter the monitor mode.
2. Print the ECG waveforms to check whether the waveforms printed are clear and correct. If yes, the recorder works normally.
3. Simulate errors by removing the recorder paper or loosening the recorder pin. Check whether the displayed information is correct. Ensure that the recorder can work normally after the failure cause is eliminated.

5.5.2 Manual Defibrillation Test

Test tools:

- Defibrillator/pacer analyzer

Charge/Discharge

1. Remove the batteries and connect the equipment with external power supply. Turn the Mode Select knob to Manual Defib.
2. Plug the therapy cable into the defibrillator monitor's therapy socket. Remove the paddle from the paddle base. Place the paddle on the defibrillator/pacer analyzer.
3. Enter the Configuration screen. In the **Record Setup** menu, set **Shock Event** to **On** so that shock events can be recorded automatically if happened.
4. Set the analyzer to Energy Measurement mode. In this case, the energy value should be displayed as 0 or blank.
5. Select the energy level to 1 J.
6. Charge/discharge the equipment to verify the energies measured by the analyzer meet the following accuracy:

Preset Energy (J)	Measured Value (J)
1	0 to 3
100	90 to 110
360	324 to 396

7. Set the energy to 100 J and 360 J respectively. Repeat step 6.
8. Disconnect the external power supply. Power the equipment with a fully charged battery. Turn the Mode Select knob to Manual Defib. Repeat steps 5 to 7.
9. Use pads. Repeat step 5 to 7.
10. Verify that the equipment records the shock events automatically and correctly.

Energy release

1. Disconnect the external power supply. Power the equipment with a fully charged battery. Turn the Mode Select knob to Manual Defib.
2. Insert the therapy cable to the therapy socket of the equipment, and connect the pads/external paddles correctly to the defibrillator/pacer analyzer.
3. Set the analyzer to Energy Measurement mode. In this case, the energy value should be displayed as 0 or blank.
4. Select the energy level to 360J.
5. Charge the defibrillator. Verify that the charge tone is issued during charging.
6. After the equipment is charged, click **Disarm** to discharge the energy.
7. Verify that a prompt **Charge Removed** appears and the charge done tone stops. Verify that the value measured by the analyzer is 0 J or blank.
8. Enter the Configuration screen. Choose **Therapy Setup >Manual Defib Setup**. Set **Time to Auto Disarm** to **60s**.
9. Restart the equipment. Set the analyzer to Energy Measurement mode. In this case, the energy value should be displayed as 0 or blank.
10. Select the energy level to 360J.
11. Count time after charging is completed. Verify that the prompt **Shock Removed** appears on the equipment and the energy measured by the analyzer is 0 J or blank after 60 seconds.

Synchronized Cardioversion

1. Plug the therapy cable into the defibrillator monitor's therapy socket. Remove the paddle from the paddle base. Place the paddle on the defibrillator/pacer analyzer.
2. Connect the monitoring module to the defibrillator monitor.
3. Plug the ECG cable into the ECG interface of the monitoring module. Connect ECG cable with the equipment and connect the leads to the defibrillator/pacer analyzer.
4. Set the mode of the defibrillator/pacer analyzer to Synchronized Cardioversion and output normal sinus rhythms, e.g. amplitude value 1 mV and HR 60 bpm.
5. Enter the Configuration screen. Choose **Therapy Setup >Manual Defib Setup**. Set **Sync After Shock** to **On**.
6. Restart the equipment. Select the energy level to 10 J.
7. Press **Enter Sync** to start synchronized cardioversion. If **Remote Sync** is set to **On**, press the **Enter Sync**, and then select **Local** in the menu displayed to start synchronized cardioversion.
8. Select **Pads** or **Paddles** as the ECG source and begin charging.
9. When charging finishes, hold down the Shock key to deliver a shock. Ensure that the following requirements are satisfied:

- Verify that synchronous discharge succeeds and the delivery energy measured by the analyzer is 10 J±2 J.
- Verify that the delay time of synchronous defibrillation measured by the analyzer is less than 60 ms.
- Verify that the synchronous discharge mark appears on the R wave.
- Verify that the prompt messages are correct during testing.

10. Select lead II as ECG source and perform charging. Repeat step 9.

5.5.3 AED Test

Test tools:

- Defibrillator/pacer analyzer

The steps to perform the AED test are as follows:

1. Connect paddles with the pads cable, insert the pads cable to the therapy socket of the equipment, and connect the pads correctly to the defibrillator/pacer analyzer.
2. Set the analyzer so that it outputs a V-Fib signal.
3. Enter the Configuration screen. Choose **Therapy Setup >AED Setup**. Set the electric shock energy to 200J, 300 J, and 360 J, respectively.
4. Restart the equipment. Press **Defibrillation/Pacing** to enter the AED mode. Check whether the equipment can perform the rhythm analysis, charging, and discharging operations.
5. Check whether the accuracy of energy values measured by the analyzer meets the requirements in the table below:

Preset Energy (J)	Measured Value (J)
200	180 to 220
300	270 to 330
360	324 to 396

5.5.4 Cardiac Pacing Test

Test tools:

- Defibrillator/pacer analyzer

The steps to perform a pacing test are as follows:

1. Disconnect the external power supply. Power the equipment with a fully charged battery.
2. Connect the monitoring module to the defibrillator monitor.
3. Press **Defibrillation/Pacing** to enter the pacing mode.
4. Set Pacer Mode to Fixed.
5. Connect the pads cable to the equipment, and place the pads correctly on the defibrillator/pacer analyzer.
6. Set the analyzer to the Pacing Measurement mode. Use the 50 Ω test load.
7. On the equipment, set **Pacer Rate** to **70 PPM** and **Pacer Output** to **30 mA**.
8. Press the **Start Pacing** soft key. Verify that the pacer rate measured by the analyzer is 70±1 PPM and the pacer output measured is 30±5 mA.
9. Press the **Stop Pacing** soft key, and then set **Pacer Rate** to **170 PPM** and **Pacer Output** to **200 mA**.
10. Press the **Start Pacing** soft key. Verify that the pacer rate measured by the analyzer is 170±2 PPM and the pacing current measured is 200±10 mA.

5.5.5 ECG test

ECG Performance Test

Test tools: Patient simulator Medsim300B

Perform the following steps:

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the simulator to the equipment's ECG connector with ECG leadwires.
3. Set the patient simulator as follows: ECG sinus rhythm, HR = 60 bpm with the amplitude as 1 mV.
4. Check that the ECG waves are displayed correctly without noise and the displayed HR value is within 60±1 bpm.
5. Disconnect the simulator from the equipment's ECG connector. Verify that ECG Lead Off alarm behaves correctly.
6. On the equipment, set **Paced** to **Yes**. The simulator is configured as pace signals. Verify that pace signals are detected and pace pulse marks are displayed.

ECG Calibration

Tool: Vernier caliper

Perform the following steps:

1. Set the **Filter** of ECG to **Diagnostic**.
2. Access **ECG Setup**.

3. Click **Calibrate**. A waveform signal appears on the screen and the message **ECG Calibrating** is displayed in the technical alarm area in the lower left corner of the screen.
4. Compare the amplitude of the waveform with the wave scale. The difference should be within 5%.
5. After ECG calibration is completed, select **Stop Calibrating**. If needed, you can also print out the waveform and the wave scale to obtain the accurate error.

5.5.6 Resp Test

Test tools:

- Patient simulator Medsim300B

Perform the following steps:

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the patient simulator to the Resp connector on the module. Set the monitor lead to II.
3. Configure the simulator as follows: set Lead to II, base impedance line to 500 Ω, delta impedance to 1 Ω, and respiration rate (RR) to 20 RPM.
4. Check that Resp waveform is not distorted and the displayed Resp value does not exceed 20 ±1 RPM.

5.5.7 SpO_2 test

Tools required: None

1. Connect the monitoring module to the defibrillator monitor.
2. Insert the adult SpO2 sensor to the SpO2 interface on the monitor, set **Patient Category** to **Adult**, and set **PR Source** to SpO2.
3. Measure the SpO2 of your finger by assuming that you are in a healthy state.
4. Check the SpO2 Pleth waveform and PR value on the monitor. The displayed SpO2 should be within the range of 95% to 100%.
5. Disconnect the SpO2 sensor from the finger and check whether the alarm SpO2 Sensor Off is reported. Check the measurement accuracy:
   The accuracy of the MPM SpO2 module has been confirmed in human experiments by comparing with the reference value of arterial blood samples measured by the CO-oxygen pressure meter. The measurement results of pulse oximeter accord with statistical distribution. Compared with the measurement results of the oxygen pressure meter, only two-thirds of the measurement results are expected to fall within the specified accuracy range.

NOTICE

The simulator cannot be used to verify the accuracy of the SpO2 monitor or sensor. It can only check whether the monitor works normally. The accuracy of the SpO2 monitor or sensor can be verified only by clinical data.

5.5.8 NIBP Test

Accuracy Test

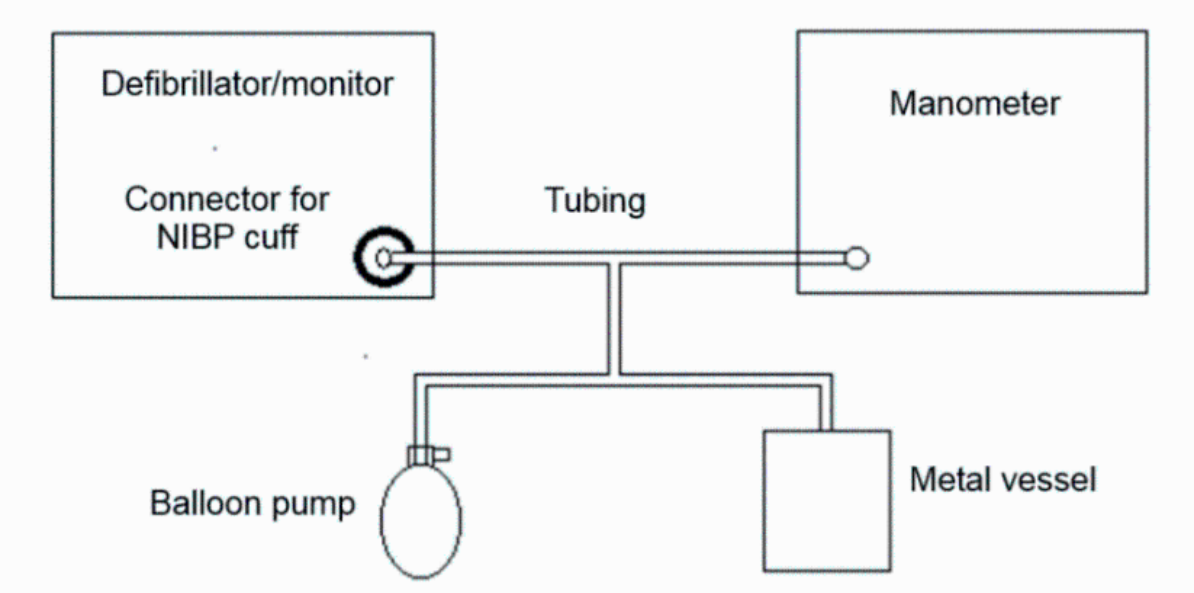
Tools required:

- T-shape connector
- Tubing
- Balloon pump
- Metal vessel with a volume of 500±25 mL
- Calibrated manometer for reference, accuracy not lower than 1 mmHg

To perform the accuracy test:

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the equipment as shown below.

Figure5–1



3. Before inflation, the reading of the manometer should be 0. If not, disconnect the airway and reconnect it until the reading is 0.
4. Enter the maintenance mode. Choose **Module>NIBP>NIBP Accuracy Test**.
5. Compare the value of manometer with the value displayed on the equipment's screen. The difference should be no greater than 3 mmHg.
6. Raise the pressure in the metal vessel to 50 mmHg with the balloon pump. Stop inflation and waits for 10s until the measured value becomes stable. Repeat step 4.
7. Raise the pressure in the metal vessel to 200 mmHg with the balloon pump. Stop inflation and waits for 10s until the measured value becomes stable. Repeat step 5.
   The accuracy test is completed. The result is displayed on the screen. If the error between the reading of the manometer and the reading on the equipment exceeds 3 mmHg, contact the service personnel. After **NIBP Accuracy Test** is selected, the key changes to **Stop NIBP**

Accuracy Test. After **Stop NIBP Accuracy Test**, the accuracy test stops and the key **Stop NIBP Accuracy Test** changes to **NIBP Accuracy Test**.

Leakage test

The leakage test is used to check the airtightness of the airway. The NIBP leakage test should be performed once a year or when you think that the NIBP reading is inaccurate.

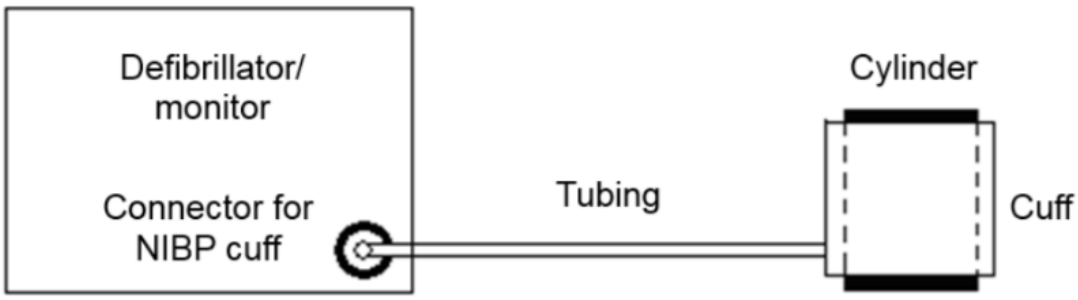
Tools required:

- An adult cuff
- An air tubing
- A correct sized cylinder

To perform the leakage test:

1. Connect the monitoring module to the defibrillator monitor.
2. In the **Patient Info.** menu, set **Patient Category** to **Adult**.
3. Connect the cuff to the NIBP cuff connector on the equipment.
4. Wrap the cuff around the cylinder as shown below.

Figure5–2



5. Enter the maintenance mode. Choose **Module>NIBP>NIBP Leakage Test**. After about 20 seconds, the equipment automatically deflates. This means the leakage test finishes. The leakage test is completed. The result is displayed on the screen. If the message "NIBP Pneumatic Leak" is displayed, it indicates that the NIBP airway may have leakage. Check the tubing and connections for leakages, and then perform a leakage test again.

After **NIBP Leakage Test** is selected, the key changes to **Stop NIBP Leakage Test**. After **Stop NIBP Leakage Test**, the leakage test stops and the key **Stop NIBP Leakage Test** changes to **NIBP Leakage Test**.

NOTICE

Before performing the leakage test, ensure that the accuracy test is performed and passed.

Overvoltage protection test

Tools required:

- T-shape connector
- Tubing
- Balloon pump
- Steel vessel with a volume of 500±25 mL
- Calibrated manometer for reference, accuracy not lower than 1 mmHg

Test steps are as follows:

1. Perform steps 1-5 in the section NIBP Accuracy Test.
2. Enter the maintenance mode. Choose **Factory Maintenance>NIBP>Overpressure Protection Circuit Test**.
3. On the **Overpressure Protection Circuit Test** page, set **Patient Category** to **Adu/Ped**, adjust the output pressure of the air pump to be within the range of 320-330 mmHg and wait until the output pressure becomes table. Click **Test**. The test starts. After the test is successful, the NIBP menu prompts **Test Successful**. If the pressure exceeds the range of 320-330 mmHg, the system prompts **Test Failed**.
4. On the **Overpressure Protection Circuit Test** page, set **Patient Category** to **Neo**, adjust the output pressure of the air pump to be within the range of 160-165 mmHg and wait until the output pressure becomes table. Click **Test**. The test starts. After the test is successful, the NIBP menu prompts **Test Successful**. If the pressure exceeds the range of 160-165 mmHg, the system prompts **Test Failed**.

5.5.9 TEMP test

Tool: Resistance box (accuracy not less than 0.1 Ω)

Test steps are as follows:

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the two ends of any temperature interface of the parameter module to those of the variable resistance box, respectively, by wires.
3. Set the value of the resistance box to 1354.9 Ω (corresponding to a temperature of 37°C).
4. Test all temperature channels of the monitor and ensure that the temperature displayed on the monitor does not exceed 37°C±0.1°C.

5.5.10 IBP Test

Performance test

Test tools:

- Patient simulator Medsim300B, MPS450, or other equivalent devices
- Connection cable for IBP test (300B, P/N: 00-002199-00) (if MPS450 is used, the P/N is 00-002198-00)

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the simulator with the IBP parameter module of the monitor.

3. Set the output value of each IBP channel to 0 mmHg.
4. Press the "Zero" key on the IBP module to zero the parameter module.
5. Set the static pressure P of the simulator to 200 mmHg.
6. The displayed value on the monitor should not exceed 200±2 mmHg.
7. If the error exceeds ±2 mmHg, calibrate the IBP parameter module. If pressure calibration is performed when a reusable IBP sensor is connected, connect this IBP sensor and then check the pressure calibration result.
8. Set the simulator to output an ART signal of 120/80 mmHg and an LV signal of 120/0 mmHg to each IBP channel, and check whether the displayed IBP waveforms are correct.

Pressure Calibration

Method 1

Test tools:

- Patient simulator Medsim300B, MPS450, or other equivalent devices
- Connection cable for IBP test (300B, P/N: 00-002199-00) (if MPS450 is used, the P/N is 00-002198-00)

Test steps are as follows:

1. Connect the monitoring module to the defibrillator monitor.
2. Connect the simulator with the IBP parameter module of the monitor.
3. Set the pressure on the simulator to 0.
4. Press the **Zero** key on the IBP module to zero the parameter module.
5. Set the static pressure P of the simulator to 200 mmHg.
6. Enter the maintenance mode. Choose **Module>IBP>Calibration**. In the **IBP** menu, set the calibrated target pressure to 200 mmHg.
7. Click **Calibrate** next to the target channel. The monitor starts calibration.
8. After the calibration is successful, the system prompts **Calibration Successful**. If the calibration failed, a prompt is displayed.

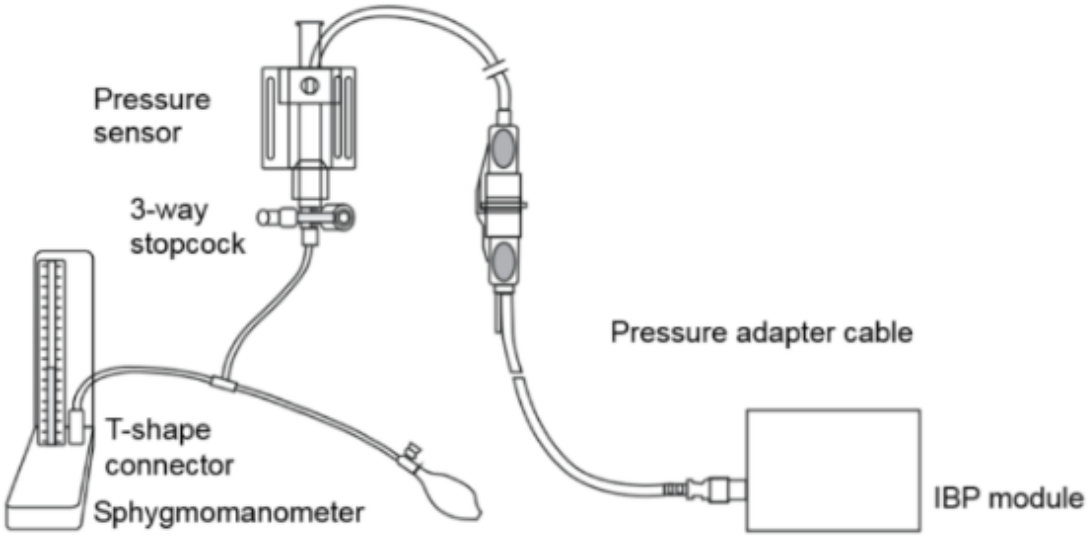
Method 2

Tools:

- Manometer
- Balloon pump
- Tubing
- T-shape connector

Test steps are as follows:

1. Connect the monitoring module to the defibrillator monitor.
2. Use a T-shape connector to connect the 3-way stopcock to the sphygmomanometer and balloon pump, as shown in the figure below.



3. Perform calibration. After the calibration is successful, connect the 3-way stopcock to the sphygmomanometer.
4. Enter the maintenance mode. Choose **Module>IBP>Calibration**. On the page displayed, set the calibration pressure of the target channel to a value within the range of 80-300 mmHg.

5.5.11 Sidestream CO_2 test

Leakage test

1. Connect the monitoring module to the defibrillator monitor.
2. Power on the equipment, make it enter the Monitor mode, and connect the accessories.
3. After the CO_2 module is warmed up, block the air inlet completely. The monitor prompts **CO2 Airway Occluded**. Block the air inlet for about 60 seconds. Select **Main Menu→Maintenance→enter the required password**→Module→**CO2**. Check whether the current flow rate is less than 10 mL/min. If yes, the module has no leakage. If the current flow rate is greater than or equal to 10 mL/min, the module has leakage.

Performance test

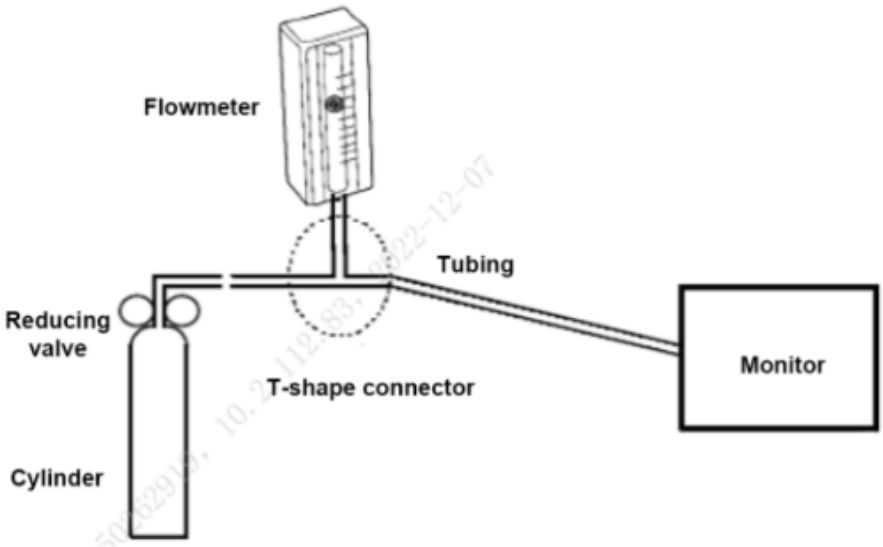
Test tools:

- Steel cylinder with CO_2 gas of 3%-7% concentration, Accuracy: a/c≤ 0.01 (a: gas absolute accuracy, c: gas concentration), and N_2 as balance gas
- Steel cylinder with O_2 gas of > 40% concentration and N_2 as balance gas (applicable for sidestream CO_2 modules with an O_2 module)
- T-shape connector
- Flowmeter

1. Connect the monitoring module to the defibrillator monitor.
2. Power on the equipment and connect accessories.

3. After the CO_2 module is warmed up, check the airway for leakage.
4. Choose **Maintenance>Module>CO2**.
5. Connect the test system as shown in the figure below.

Figure5–3



6. Turn on and adjust the reducing valve switch so that the flow reading on the flowmeter is within the range of 10-50 mL/min and kept stable.
7. Ensure that the error between the real-time CO2 concentration displayed in the Calibrate menu and the actual concentration is within the range of±5%%.

Module calibration

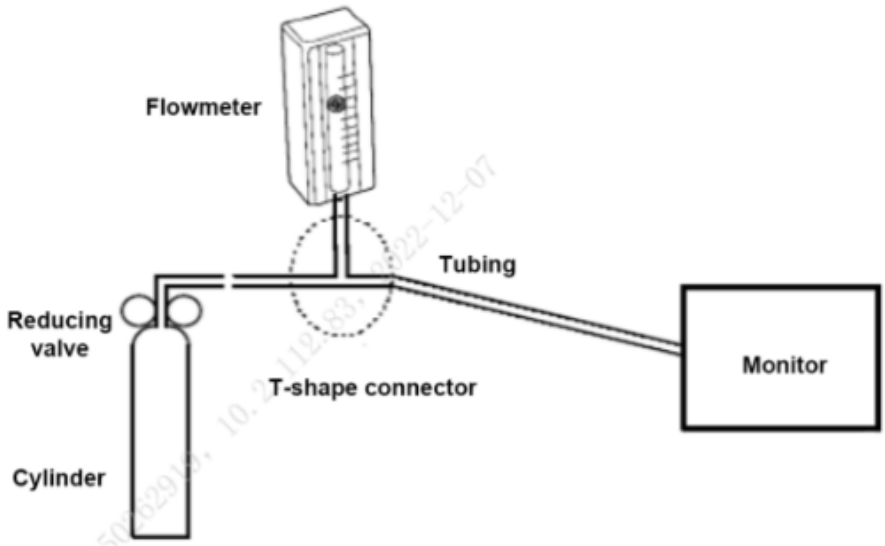
Test tools:

- Steel cylinder with CO2 gas of 3%-7% concentration , Accuracy: a/c≤ 0.01 (a: gas absolute accuracy, c: gas concentration), and N_2 as balance gas
- T-shape connector
- Tubing
- Flowmeter

Procedure:

1. Connect the monitoring module to the defibrillator monitor.
2. Ensure that the CO_2 module has been warmed up or started.
3. Check the airway for leakage.
4. Access the **CO2** menu, choose **Main Menu Maintenance, input the user maintenance password, and then choose** Module**CO2**.
5. In the **CO2** menu, click **Zero**.
6. After zeroing, connect the components as shown below.

Figure5–4



7. Turn on and adjust the reducing valve switch so that the flow reading on the flowmeter is within the range of 10-50 mL/min and kept stable.
8. In the **Calibrate** menu, input the CO2 concentration in the **CO2%** field.
9. In the **Calibrate** menu, the real-time CO2 concentration measured is displayed. After the measured CO2 concentration becomes stable, select **Calibrate** to calibrate the CO2 module.
10. After the calibration is successful, the **Calibrate** menu will prompts **Calibration Successful**. If the calibration failed, the system prompts **Calibration Failed**. In this case, check the calibration operation and perform calibration again. If calibration failed for multiple times, return the equipment to the factory for repair.

5.5.12 IR Ear TEMP Test

Perform the following steps:
1. Pick up the ear thermometer from the base.
2. Check the ear thermometer probe. Clean the dirt, if any, on the probe.
3. Measure a set of values with the ear thermometer, stick the NFC label to a place near the Discharge button on the front panel of the equipment, and wait until a Di sound is generated. This means that the ear thermometer has been connected to the equipment through NFC.
4. Check whether the temperature displayed on the monitor is consistent with the measured value of the ear thermometer.

5.5.13 Camera Test

Perform the following steps:
1. Enter the monitor mode.

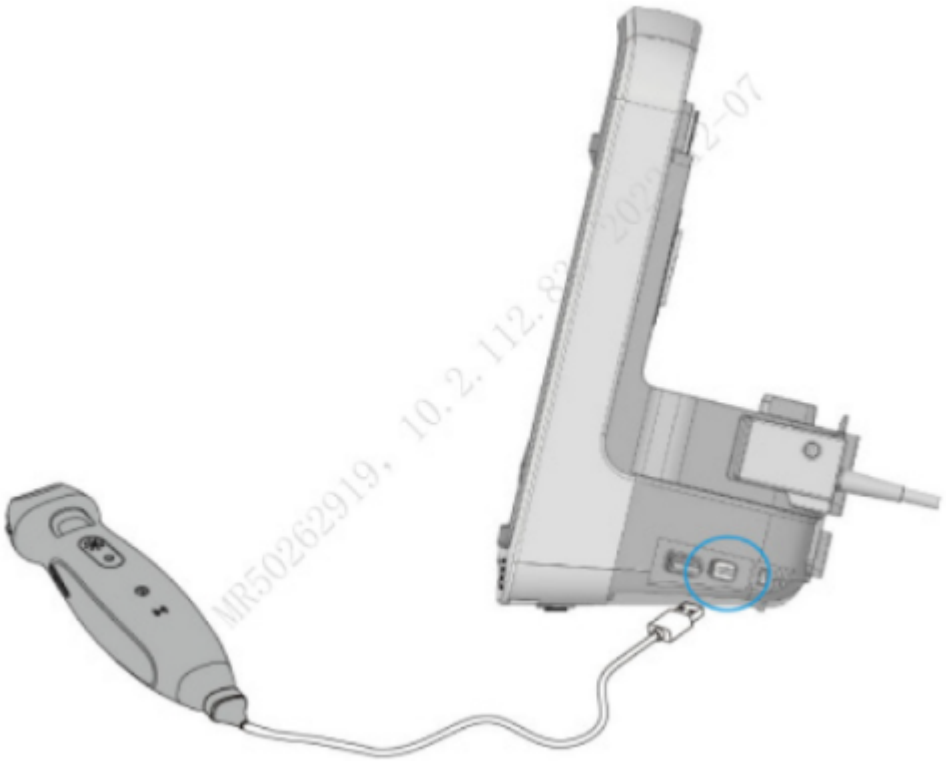
2. On the Main Screen page, click **>>** in the lower part. In the menu displayed, click **Camera Capture**.
3. Check whether the equipment displays the images in the correct color and resolution.

5.5.14 Ultrasound Test

Perform the following steps:

1. Insert the ultrasound probe cable connector to the USB 3.0 interface of the equipment. See the figure below.

Figure5–5



2. Hold down the power key of the ultrasound probe for two seconds to power on the probe. After the hand-held ultrasound probe is powered on, its power indicator lights up.
3. In the lower part of the Main Screen page, click **>>**. In the menu unfolded, click **Ultrasound** to enter the ultrasound exam window. Check whether the equipment displays ultrasound images normally.

5.5.15 Respiratory Impedance Test

Perform the following steps:

1. Check that the paddle cable is properly connected to the therapy socket of the equipment, and place the paddles correctly on the defibrillation pace analyzer.
2. If no paddles are connected to the equipment, connect the pads cable to the therapy socket first, and then connect the cable with the 50 Ω test load.
3. Enter the maintenance mode. Choose **Factory Maintenance> Debug**. Turn on DebugMode. Exit the restart process.
4. After the equipment restarts, press **-**, **+**, and **Discharge** on the panel in sequence. The Debug page is displayed.
5. Check whether the value of RT Imped is 500±75. If yes, the test is passed.
   If the value of RT Imped of connected paddles is not within this range, disconnect the adult paddles, and perform the test on pediatrics paddles again. If the test is passed, perform the test on adult paddles again. If the test also failed, replace all the paddles. If the test still failed after the pads cable and test load are connected or after all the paddles are replaced, replace the therapy module.

5.5.16 Electrical Safety Test

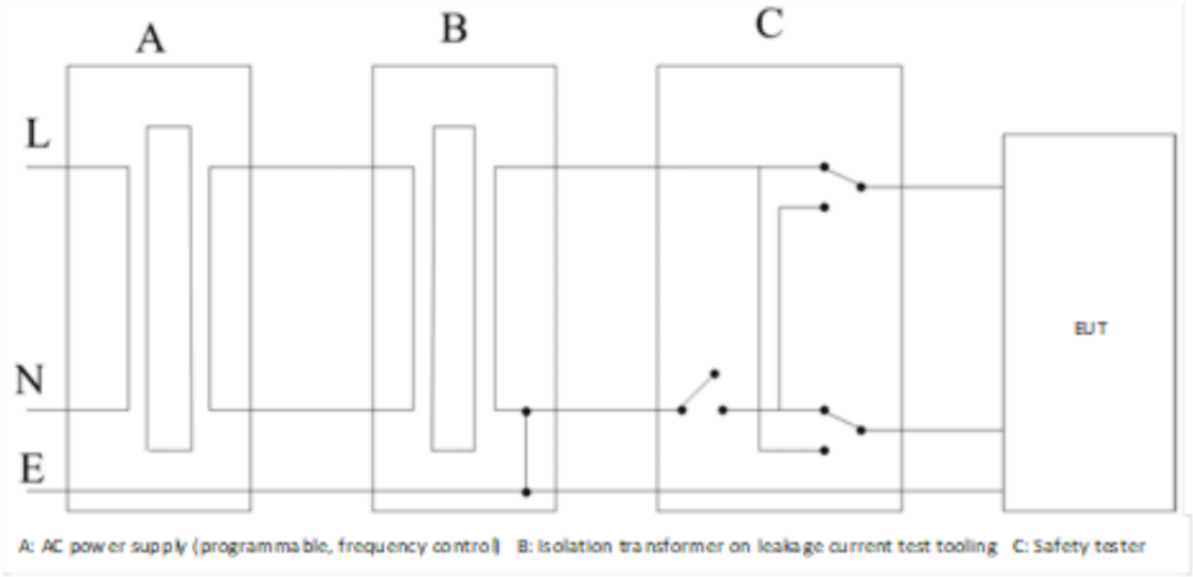
WARNING

- **Electrical safety test is a proven means of detecting abnormalities that, if undetected, could prove dangerous to either the patient or the operator.**
- **All tests can be performed using commercially available safety analyzer and other test devices. Maintenance personnel shall ensure the adaptability, functional completeness, and safety of the test devices, and be familiar with their usage.**
- **Electrical safety test shall comply with the following standards of the latest version: EN 60601-1 and UL60601.**
- **In case of other stipulations in local laws and regulations, implement electrical safety tests by following relevant stipulations.**
- **All devices driven by AC power and connected to medical instruments in patient zones must comply with the IEC 60601-1 standard. The electrical safety tests on these devices must be implemented in accordance with the test interval of the equipment.**

Electrical safety tests are used to timely detect potential electrical safety risks that might cause injuries to patients, operators, or maintenance personnel. Electrical safety tests must be carried out in the normal environment (including temperature, humidity and barometric pressure). The electrical safety tests described in this section take the 601 safety analyzer as an example. The safety analyzer used in different regions may vary. Make sure that the electrical safety test protocol you adopted is applicable.

Equipment connection is shown in the following figure.

Figure5–6



Test tools:

- Safety analyzer
- Isolation transformer

Shell leakage current test

1. Connect the 601 safety analyzer to a 264 V AC, 60 Hz power supply.
2. Connect the equipment under test (EUT) to the safety analyzer through the applied part connection tooling, with the SUM end of the tooling connected to the RA end of the safety analyzer.
3. Use the power cord to connect the EUT to the auxiliary power output connector of the 601 safety analyzer.
4. Connect one end of the red test lead to the **Red input terminal** of the safety analyzer, and clamp the other end on the metal foil tightly attached to the surface of the EUT shell.
5. Power on the 601 safety analyzer, and press **5–Enclosure leakage** on the panel of the analyzer to go to the shell leakage current test page.
6. The shell leakage current is not more than 100 μA in the normal state or not more than 300 μA in the single fault state.

Earth Leakage Current

1. Connect the 601 safety analyzer to a 264 V AC, 60 Hz power supply.
2. Connect the equipment under test (EUT) to the safety analyzer through the applied part connection tooling, with the SUM end of the tooling connected to the RA end of the safety analyzer.
3. Use the power cord to connect the EUT to the auxiliary power output connector of the 601 safety analyzer.

4. Power on the 601 safety analyzer, and press **4−Earth leakage** on the panel of the analyzer to go to the earth leakage current test page.
5. The earth leakage current is not more than 300 μA in the normal state or no more than 1000 μA in the single fault state.

Patient Leakage Current Test

1. Connect the 601 safety analyzer to a 264 V AC, 60 Hz power supply.
2. Connect the equipment under test (EUT) to the safety analyzer through the applied part connection tooling, with the SUM end of the tooling connected to the RA end of the safety analyzer.
3. Use the power cord to connect the EUT to the auxiliary power output connector of the 601 safety analyzer.
4. Power on the 601 safety analyzer, and press **6−Patient leakage**.
5. Press **APPLIED PART** continuously to select the AC measurement and DC measurement. In DC mode, **DC** is displayed next to the limit.
6. The patient leakage current is not more than 10 μA in the normal state or no more than 50 μA in the single fault state.

Patient Auxiliary Current Test

1. Connect the 601 safety analyzer to a 264 V AC, 60 Hz power supply.
2. Use the power cord to connect the EUT to the auxiliary power output connector of the 601 safety analyzer.
3. Connect the sensor of the applied part to the applied part connection tooling, with the RA end of the 601 safety analyzer to the RA-P end of the tooling and the SUM end to the LA end of the 601 safety analyzer. Turn on the RA switch.
4. Power on the 601 safety analyzer, and press **8−Patient Auxiliary Current Test** on the panel of the analyzer to go to the patient auxiliary current test page.
5. Press **APPLIED PART** continuously to select the AC measurement and DC measurement. In DC mode, **DC** is displayed next to the limit.
6. The patient auxiliary current is not more than 10 μA in the normal state or no more than 50 μA in the single fault state.

5.6 Factory Maintenance

5.6.1 Entering Factory Maintenance Mode

Select **Main Menu**. On the second screen, select **Maintenance** from the **System** column. Enter the required password. Select **OK**. Select Factory Maintenance.

5.6.2 Monitor Information (Log Export)

Check whether the format of files in the USB flash disk is FAT32, and then connect the USB flash disk to the USB port of the monitor main unit, instead of the USB port on the side of the equipment. Choose **Factory Maintenance>Monitor Information**. On the window displayed, you can view information of the monitor main unit, such as the Wi-Fi signal strength and hard disk capacity.

In the lower left corner of the window, click **Export Log** to export all the monitor logs.

5.6.3 Production Test

Access the **Production Test** menu, in which you can test basic functions related to hardware interfaces of the monitor. Production test can be performed either in the man-machine interaction mode or single-test mode.

- Man-machine interaction: Click **Start**. The system performs all the tests automatically in the specified sequence.
- Single-test: Select a test and then perform the test.

5.6.4 Factory Configuration

Click **Installation Wizard**. After the equipment restarts, it enters the installation wizard screen.

5.6.5 Software License

You can check whether a software function is installed on the **Local** screen. You can install a software function with the license through the USB flash drive on the **External** screen.

5.6.6 Setup

Access the **Setup** menu, in which you can set ECG alarm parameters and other parameters.

5.6.7 Clinical Data Acquisition

Access the **Clinical Data Collection** menu, in which you can set parameters for clinical data collection.

When Clinical Data Location is set to **None**, the clinical data is saved on the monitor and can be exported to a USB flash disk by clicking **Export Log**. When Clinical Data Location is set to **Udisk**, the clinical data is directly saved on the USB flash disk.

5.6.8 Debugging Mode

Access the **Debug** menu, in which you can set commissioning parameters.

5.6.9 Viewing Failure Codes

Select **Main Menu**. On the second screen, select **Maintenance** from the **System** column. Enter the required password. Select **OK**. Select Factory Maintenance. The **Failure Code** page is displayed, which shows the failure code details. For details, see section Failure Codes.

5.6.10 Function Setup

Click **Factory Function** to set relevant functions. Functions need to be set only when a module is upgraded or the main control board is replaced. Select functions you want to configure, click Back to exit the Factory Maintenance page, and restart the machine.

NOTICE

Check whether this function is supported by the machine configuration. If no, an alarm will be reported.

5.6.11 Impedance

The **Impedance** function is used for factory test only.

5.6.12 Paddle Open Display

Choose **Defibrillator>Open Display**. This function is used for factory test only. Set this function to **OFF** when using the equipment.

5.6.13 Quick Start

Choose **Defibrillator>Fast Startup**. This function is used for factory test only. Set this function to **ON** when using the equipment.

5.6.14 CPR Analysis

Choose **Defib>CPR Analysis**. The CPR analysis function is used for factory test only. Set this function to **OFF** when using the equipment.

NOTICE

- **System logs (including alarm logs) stored on the equipment are retentive upon power failure, and power-on/off operations are also logged.**
- **Up to 50 MB of system logs (including alarm logs) can be stored on the equipment. Additional logs will overwrite old logs in the principle of First In First Out**

Maintenance Test Report

See the above sections for detailed test procedures and contents.

User name		
User address		
Maintenance personnel		
Maintenance company		
EUT		
EUT model		
EUT SN		
Hardware version		
Software version		
EUT	**Model/No.**	**Standard Validity Period**

Test Items	**Test Records**	**Test Results (Pass/Fail)**
Visual Check		
The shell, display, buttons, knob, modules, power cord, and accessories have no obvious signs of damage.		
The external connectors are not frayed and the connector pins are not loose or bent.		
The external connectors are not loose or their pins are not bent.		
The safety labels and nameplates are clearly legible.		
Power−on Test		
The power-on test is passed. The power indicator and alarm system work correctly. The equipment starts up properly.		
User Test		
The user test is passed.		

Test Items	Test Records	Test Results (Pass/Fail)
Performance test		
Recorder Test		
Print the ECG waveforms to check whether the waveforms printed are clear and correct. If yes, the recorder works normally.		
Simulate errors by removing the recorder paper or loosening the recorder pin. Check whether the displayed information is correct. Ensure that the recorder can work normally after the failure cause is eliminated.		
Manual Defibrillation Test		
When the equipment runs on AC mains and external paddles are used, the equipment can be properly charged and discharged; the energy delivered meets the requirement for accuracy, and the shock information is correctly recorded.		
When the equipment runs on a fully charged battery and external paddles are used, the equipment can be properly charged and discharged; the energy delivered meets the requirement for accuracy, and the shock information is correctly recorded.		
When the equipment runs on AC mains and multifunctional electrode pads are used, the equipment can be properly		

Test Items	Test Records	Test Results (Pass/Fail)
charged and discharged; the energy (1 J/100 J/360 J) delivered meets the requirement for accuracy, and the shock information is correctly recorded.		
When the equipment runs on a fully charged battery and pads are used, the equipment can be properly charged and discharged; the energy (1 J/ 100 J/360 J) delivered meets the requirement for accuracy, and the shock information is correctly recorded.		
When external paddles are used, the charge tone is correctly issued when the equipment is being charged. The prompt **Charger Removed** is shown on the screen and the charge done tone stops when **Disarm** is clicked. The equipment does not discharge externally. When **Time to Auto Disarm** is set to **60s**, the prompt **Charger Removed** is shown on the screen and the charge done tone stops after 60 seconds at the completion of charging. The equipment does not discharge externally.		
When pads are used, the charge tone is correctly issued when the equipment is being charged. The prompt **Charger Removed** is shown		

Test Items	Test Records	Test Results (Pass/Fail)
on the screen and the charge done tone stops when **Disarm** is clicked. The equipment does not discharge externally. When **Time to Auto Disarm** is set to **60s**, the prompt **Charger Removed** is shown on the screen and the charge done tone stops after 60 seconds at the completion of charging. The equipment does not discharge externally.		
When external paddles are used for synchronized cardioversion and the ECG source is paddles and lead II respectively, the prompt is correct and a Sync mark appears above each R wave. The delivered energy measured is 10 J±2 J and the synchronous shock is delivered within 60 ms of the peak of the R wave.		
When pads are used for synchronized cardioversion and ECG source is paddles and lead II respectively, the prompt is correct and a Sync mark appears above each R wave. The delivered energy measured is 10 J±2 J and the synchronous shock is delivered within 60 ms of the peak of the R wave.		
AED Test		
When the equipment runs on a fully charged battery and pads are connected to the		

Test Items	Test Records	Test Results (Pass/Fail)
defibrillator/pacer analyzer, the rhythms can be analyzed and the equipment can be properly charged and discharged. The energy (200 J/300 J/360 J) delivered meets the requirement for accuracy, and the shock information is correctly recorded.		
Cardiac Pacing Test		
When **Pacer Rate** is set to **70 ppm** and **Pacer Output** is set to **30 mA**, the pacer rate measured by the analyzer is 70 ppm±1 ppm, and the pacer output measured is 30 mA±5 mA.		
When **Pacer Rate** is set to **170 ppm** and **Pacer Output** is set to **200 mA**, the pacer rate measured by the analyzer is 170 ppm±2 ppm, and the pacer output measured is 200 mA±10 mA.		
ECG performance test		
The ECG waves are displayed correctly without noise and the displayed HR value is within 60±1 bpm		
The ECG Lead Off alarm behaves correctly.		
Paced signals are detected and pace pulse marks are displayed when Paced is set to ON.		
The difference between the amplitude of the ECG		

Test Items	Test Records	Test Results (Pass/Fail)
calibration square wave and that of the wave scale is not greater than 5%.		
Resp Test		
The Resp waveform is not distorted and the displayed Resp value does not exceed 20±1 RPM.		
SpO_2 test		
When the test is performed on a finger of a healthy person, the SpO2 Pleth waveform and PR value are displayed on the monitor. The displayed SpO2 should be within the range of 95% to 100%.		
The SpO2 Lead Off alarm behaves correctly.		
NIBP Test		
Connect the equipment, manometer, balloon pump, and metal vessel. Compare the value of manometer with the value displayed on the equipment's screen. The difference should be no greater than 3 mmHg.		
The leakage test is passed.		
The result of Calibrate Overpressure is Test Successful.		
TEMP test		
Test all temperature channels of the monitor and ensure that the temperature displayed on the monitor does not exceed 37°C±0.1°C.		

Test Items	Test Records	Test Results (Pass/Fail)
IBP Test		
The static pressure of each IBP does not exceed 200±2 mmHg.		
The displayed ART and LV waveforms of each IBP channel are correct.		
Sidestream CO_2 test		
Block the gas inlet of the watertrap. The sidestream CO_2 flowrate is slower than 10 mL/min and an alarm of CO_2 Airway Occluded is given. It indicates insert there is no leakage.		
The displayed CO_2 value is 6%±0.2%.		
IR Ear TEMP Test		
The temperature displayed on the monitor is consistent with the measured value of the ear thermometer.		
Camera Test		
The equipment displays the images in the correct color and resolution.		
Ultrasound Test		
The equipment displays ultrasound images normally.		
Impedance measurement test		
The value of RT Imped is 500±75.		
Electrical Safety Test		
The shell leakage current is not more than 100 μA in the normal state or not more than		

Test Items	Test Records	Test Results (Pass/Fail)
300 μA in the single fault state.		
The earth leakage current is not more than 300 μA in the normal state or no more than 1000 μA in the single fault state.		
The patient leakage current is not more than 10 μA in the normal state or no more than 50 μA in the single fault state.		
The patient auxiliary current is not more than 10 μA in the normal state or no more than 50 μA in the single fault state.		

Tester: Date:

5.7 Hardware Upgrade

5.7.1 Upgrade FRU Kit

This monitor supports the upgrade of wireless functions (4G/5G/Wi-Fi), NFC functions and ultrasound functions.

No.	Upgrade Package	Upgrade Package Code	Remarks
1	4G Upgrade FRU Kit (CN)	115-096895-00	
2	Wi-Fi Board Assy FRU	115-090712-00	
3	5G Module Upgrade assembly	115-096896-00	
4	NFC Upgrade Package	115-096898-00	Cooperated with IR Ear TEMP

No.	Upgrade Package	Upgrade Package Code	Remarks
5	Ultrasound Function (Without Probe) Upgrade Package (Pad)	115-097060-00	
6	Ultrasound Function (Without probe) Upgrade Package (Paddle)	115-097062-00	

5.7.2 Upgrade Procedure

For the wireless function and NFC function, see the FRU chapter to remove and install the upgrade package.

Ultrasound function (without probe) upgrade package (pad):

Upgrade the ultrasound function by referring to the front and rear shell power-on procedure (see **6.39.2** Disassembly and Assembly), and the removal and installation procedures of 0656 D60 iView FPC (see **6.34.2** Disassembly and Assembly), Slave Board Assy FRU (see **6.54.2** Disassembly and Assembly), 0659 Rear Cover Assembly (Pad/Type-C) FRU (see **6.68.2** Disassembly and Assembly), and USB 3.0 Type-C Interface Board Assembly (Pad) FRU (see **6.66.2** Disassembly and Assembly).

Ultrasound function (without probe) upgrade package (paddle):

Upgrade the ultrasound function by referring to the front and rear shell power-on procedure (see **6.39.2** Disassembly and Assembly), and the removal and installation procedures of 0656 D60 iView FPC (see **6.34.2** Disassembly and Assembly), Slave Board Assy FRU (see **6.54.2** Disassembly and Assembly), 0659 Rear Cover Assembly (Paddle/Type-C) FRU (see **6.70.2** Disassembly and Assembly), and USB 3.0 Type-C Interface Board Assembly (Paddle) FRU (see **6.64.2** Disassembly and Assembly).

5.7.3 Test After Upgrade

After upgrading the equipment, perform tests according to the following table.

No.	Test Item	Remarks
1	Appearance check	
2	Power-on Test	
3	Detecting Performance	
4	Electrical Safety Test	

5.8 Software Upgrade

5.8.1 Overview

Functions of this monitor and its peripheral firmware can be upgraded through a PC network or a USB flash disk.

- This monitor can be upgraded by using the Mindray monitor network upgrade software, which can directly run on a laptop or a desktop PC. Connect the monitor with the PC through a network cable or a crossover network and then upgrade the monitor programs.
- The monitor programs can also be upgraded by using authorized USB flash disk.

The following programs of the equipment can be upgraded:

- Linux kernel
- System software
- MPM software
- CO2 module software
- SpO2 module software
- Recorder module software
- SPI FPGA software
- Bluetooth firmware
- Wi-Fi firmware
- Touchscreen firmware
- Therapy module software
- Power management board software

⚠CAUTION

- **Disconnect the equipment from the patient and ensure that important data are saved before upgrade.**
- **Do not shut down or power off the equipment when upgrading the boot program. Otherwise, the equipment may break down.**
- **Upgrade should be performed by qualified service personnel only.**
- **Crossover network cable shall be used if a PC is connected for equipment upgrade.**
- **To upgrade the equipment using a USB flash disk, ensure that the USB flash disk supports the format FAT32 and has a remaining capacity of at least 100 MB.**

NOTICE

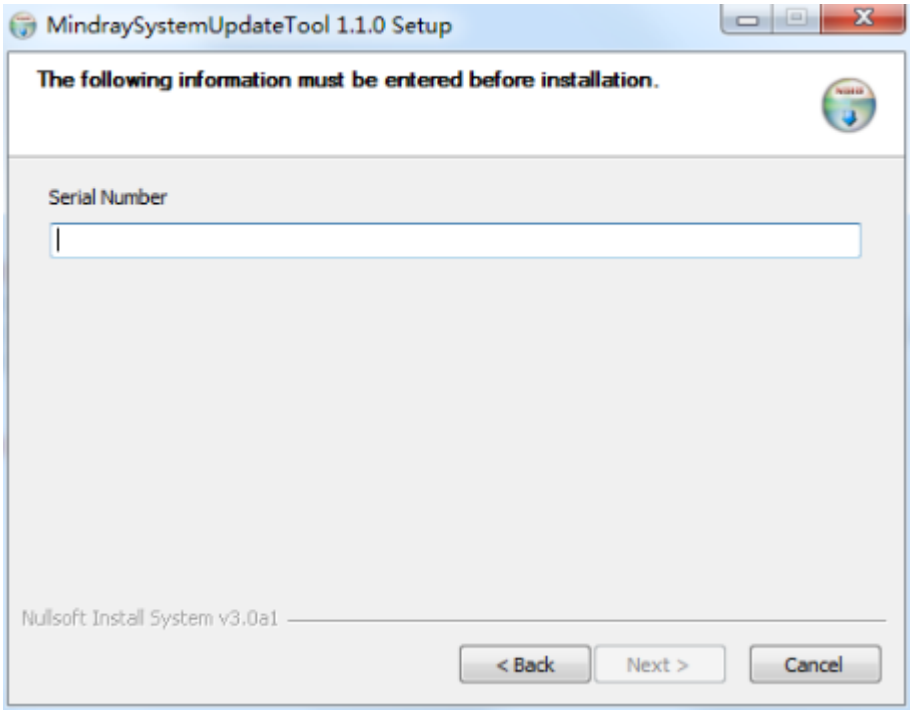
- **After the system software is upgraded, restart the equipment to confirm that the upgrade software version is correct and perform the power-on test and manual test.**
- **After the boot program is upgraded, the system program and other programs must be upgraded again to ensure compatibility among them.**
- **Before upgrading, ensure that the upgrade package is of the target version. To get the latest program upgrade package, contact our Customer Service Department.**

5.8.2 Tools for Upgrade over Network

How to Install the Tool Software

1. Click SystemUpdateTool.exe. On the wizard displayed, click Next > to enter the **Serial Number** page.

Figure5–7



2. Enter the serial number, and click Next > to enter the program installation path page. Select the installation folder, click Next >, and perform following steps as instructed.

How to Connect the PC with the Monitor

Ensure that the PC has at least one NIC and the PC is connected with the monitor through the NIC.

1. Connect the PC to the monitor through a hub.
   - To connect the PC with the hub through a network cable, connect one end of the network cable to the NIC slot of the PC and connect the other end of the network cable to a slot on the hub.
   - Connect the hub to the monitor through a network cable in the same way. One hub has multiple slots and thus can be connected to at least 5 monitors at a time for upgrade.
2. Modify the IP address of the PC NIC.

NOTICE

To ensure successful upgrade, before running the upgrade program, set the IP address to 77.77.1.xx. There is no restriction on the gateway and DNS addresses. For example, you can set the IP address to 77.77.1.13 and the subnet mask to 255.255.255.0.

To enter the upgrade mode:

- Connect the equipment to the PC through a network cable. Hold down **+ charge**, power on the equipment again, and wait until the equipment enters the upgrade mode.

Software Tool Upgrade

Set the software upgrade package of each product based on the above configuration requirements. The setting can only be made and managed by the administrator. Set the system software upgrade package as follows:

1. Download the Orbit system software package to the model package path, run the installed system or network upgrade tool software, and then click **Select A New Model Package**, select **Orbit.Tool** model package, **open it**, and then click **OK**.

Figure5–8

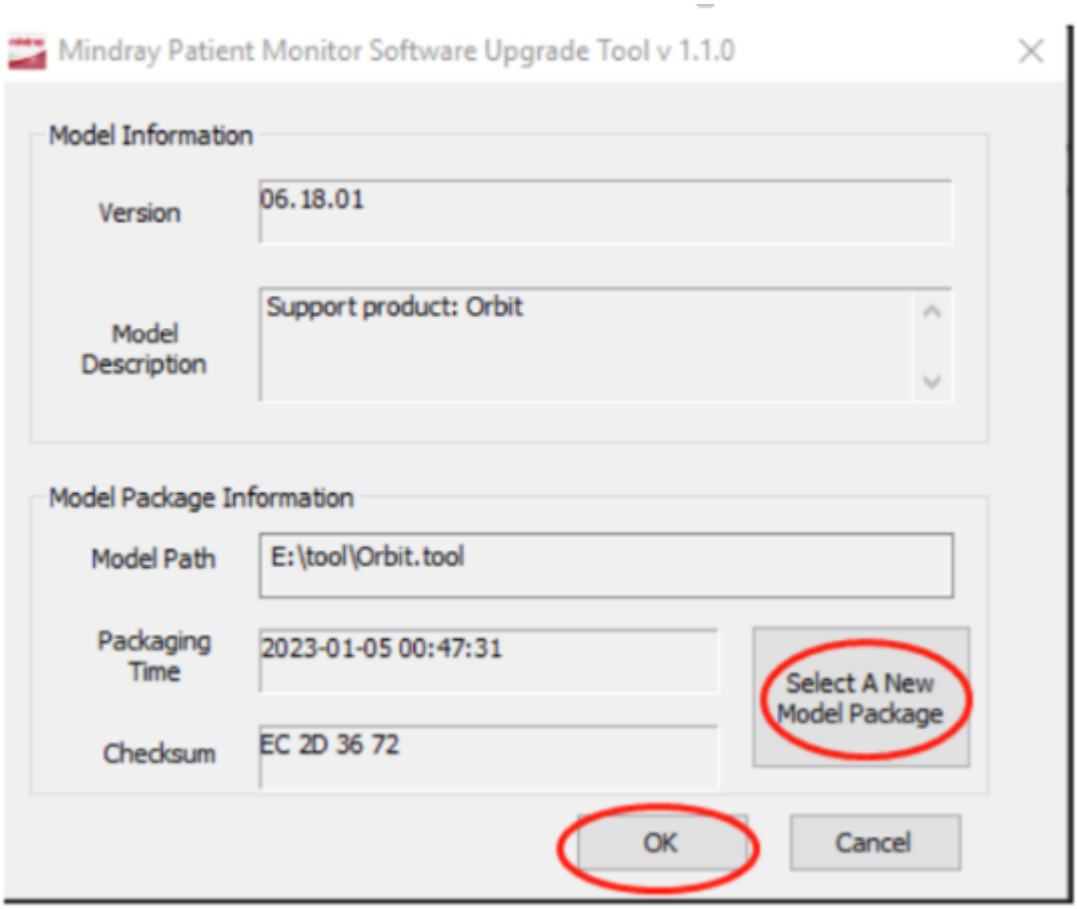
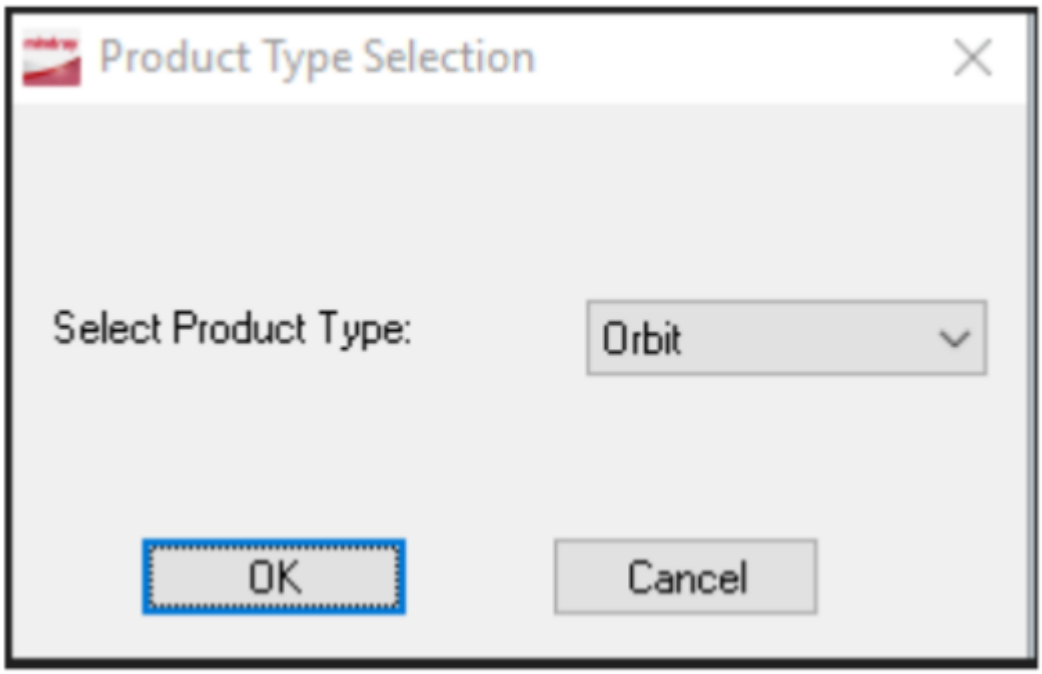


Figure5–9

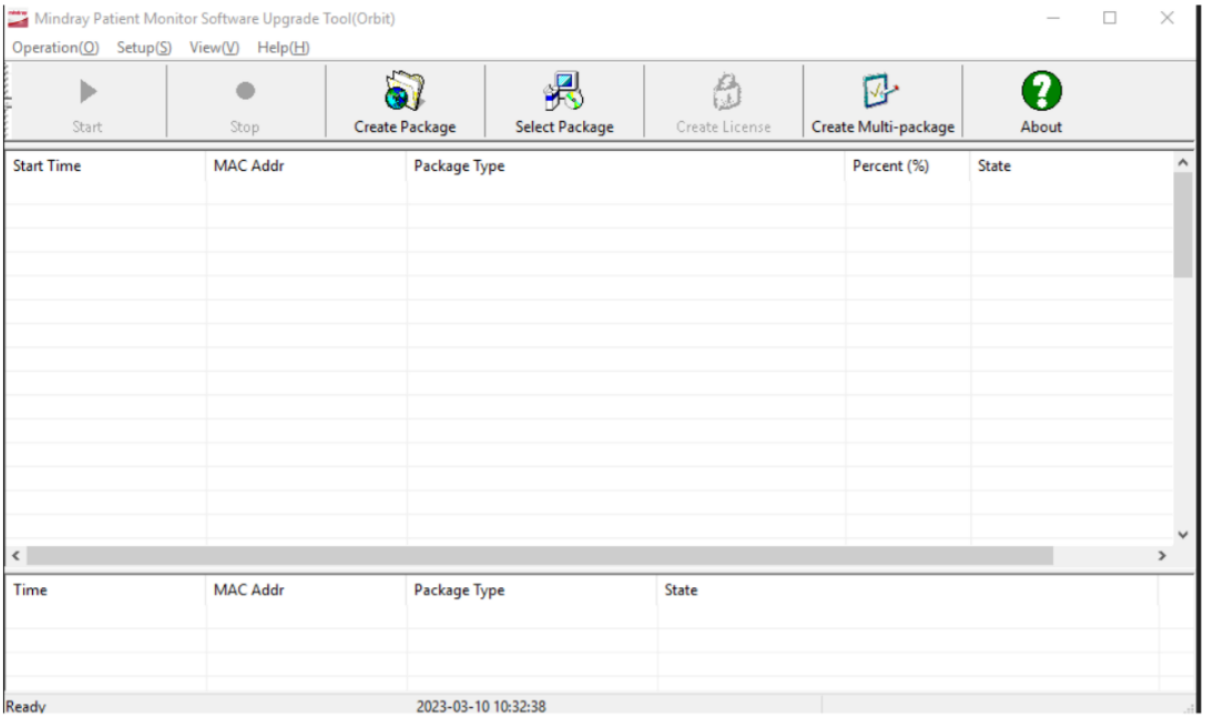
2. On the machine type selection page displayed, select **Orbit**

Figure5–10



The PC displays the following page:

Figure5–11



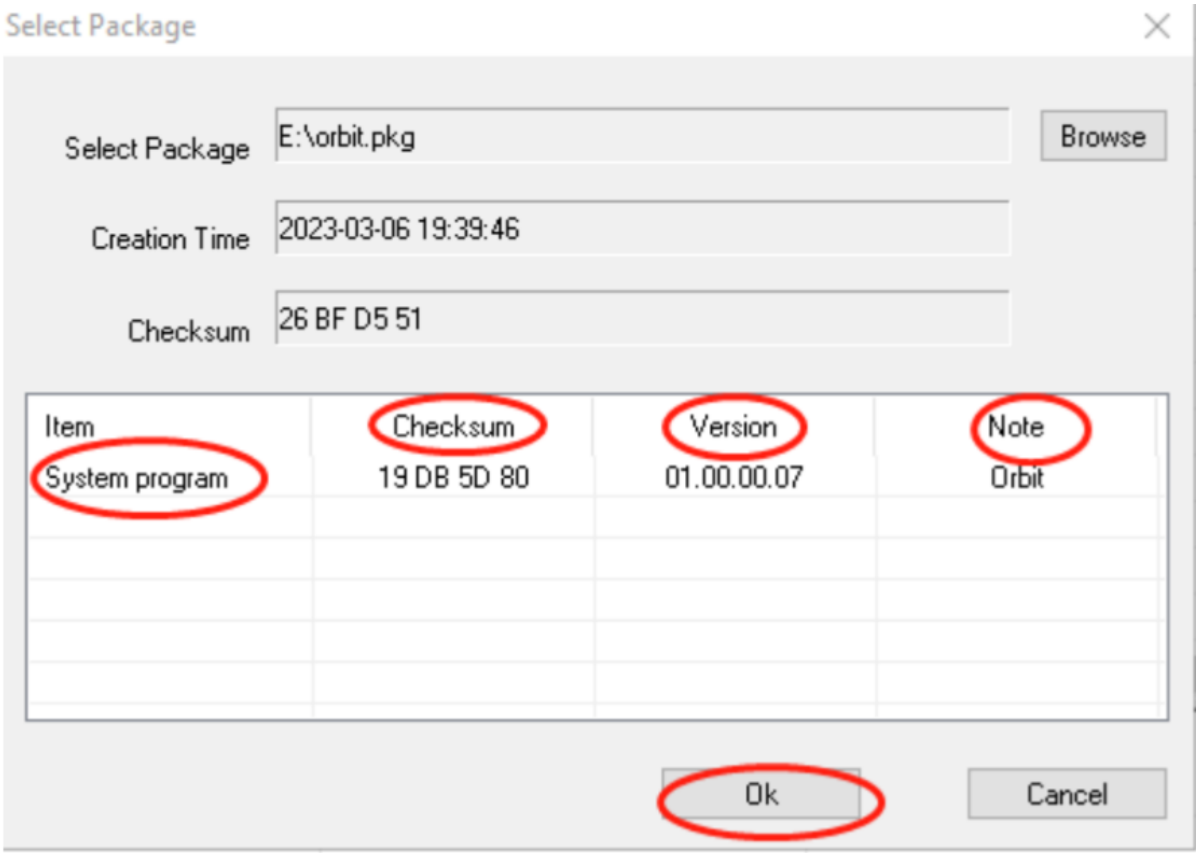
5.8.3 Software Upgrade Guide

System Software Upgrade Method

1. Enter the main interface for downloading of system upgrade, and click 

.
2. Select the prepared system software upgrade package file through browsing, check to ensure that the selected downloading content (including the information such as the upgrade item, check sum, version and description) is correct, and then click **OK**. Then the **Start** hot key in the main menu lights up.

Figure5–12



3. Ensure that the network cable is connected properly and the monitor is powered off, and click **Start** of the upgrade tool. The system downloads the software.

Module Software Upgrade

Upgrade the module program as instructed in the upgrade method of the system software above. After the program is upgraded, click **Stop** in the upgrade menu, disconnect the network cable, and power off and then on the monitor.

Restart the equipment. Choose **Main MenuMaintenance**, enter the factory maintenance password, and then click **Version**. Check the displayed version.
For details of upgrading a network program, see instructions and help information about the Mindray monitor network upgrade software, or consult Customer Service Department.

5.8.4 USB Flash Drive Upgrade Guide

Preparing the Upgrade Directory Structure of USB Flash Disk

Tools:

- Prepare a common USB flash disk (Kingston, Netac and other models) of which the system capacity is larger than 2 GB and choose FAT32.

1. Create a folder named UPGRADE_AMP\Orbit in the root directory of the USB flash disk.
2. Copy the upgrade boot program Orbit_Installer.pkg (do not rename the file) to the directory UPGRADE_AMP\Orbit.
3. Copy the upgrade file in the format of PKG or MPKG to the directory UPGRADE_AMP\Orbit.

Inserting the USB Flash Disk to the USB Port of the Equipment

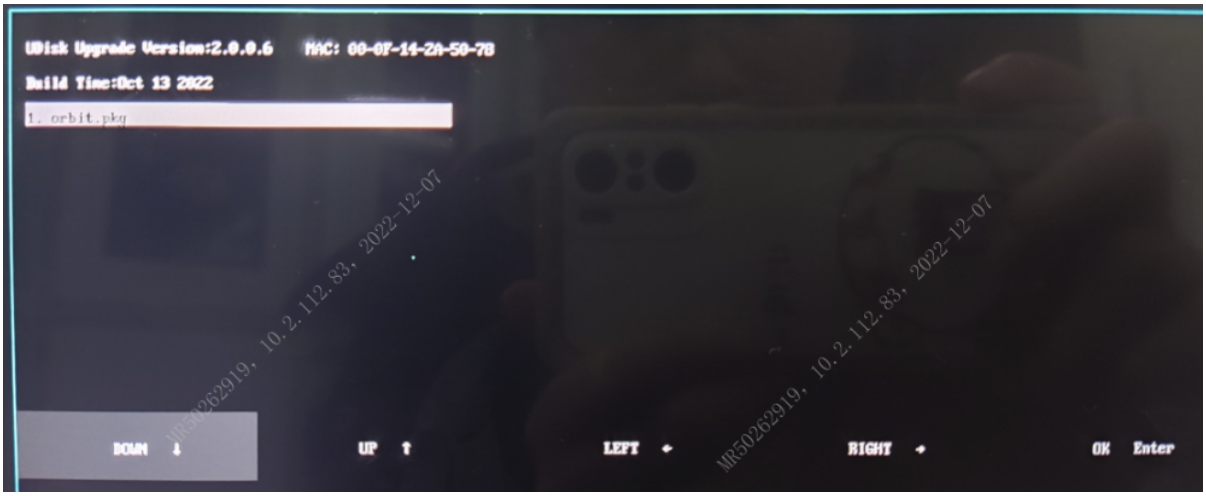
Insert the prepared USB flash disk into the USB port of the equipment.

Performing Upgrade

- Hold down **+charge**, power on the equipment again, and wait until the equipment enters the upgrade mode.

Selecting the File

Figure5–13



- If the USB flash disk just contains the upgrade kit file, the file is selected by default. If multiple upgrade kits are available, up to 16 kits are displayed in two columns. You can press the direction key to select the target upgrade kit.
- Click the 

area on the touchscreen. The cursor moves downward, and you can select the upgrade program. You can also press ↓ on the keypad to select the upgrade program.
- Click the 

area on the touchscreen. The cursor moves upward, and you can select the upgrade program. You can also press ↑ on the keypad to select the upgrade program.
- Click the 

area on the touchscreen. The cursor moves to the left, and you can select the upgrade program. You can also press ← on the keypad to select the upgrade program.
- Click the 

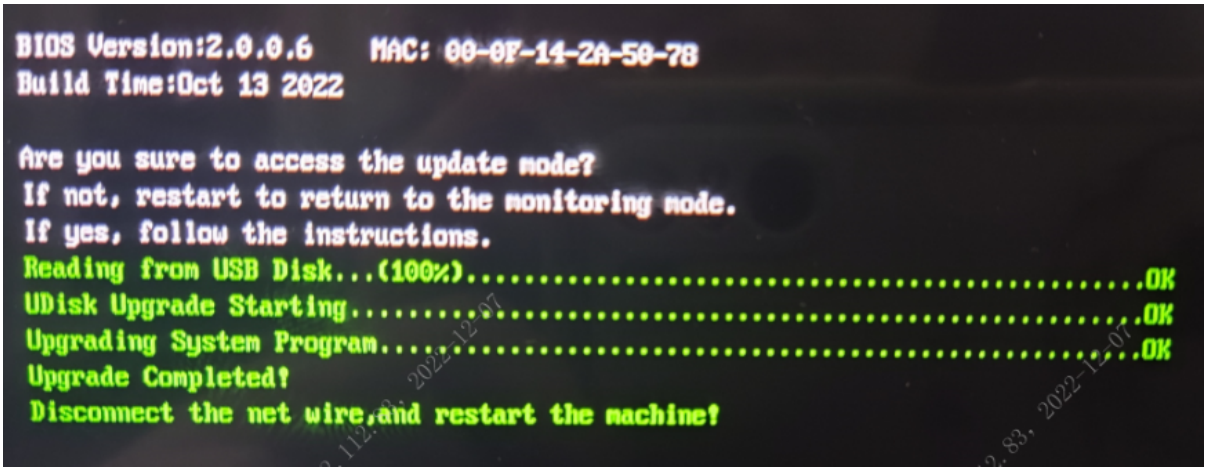
area on the touchscreen. The cursor moves to the right, and you can select the upgrade program. You can also press → on the keypad to select the upgrade program.
- Click the 

area on the touchscreen or press the **Enter** key on the keypad to confirm the selected upgrade program.

Completing Upgrade

When the following page is displayed, the program is upgraded. Restart the device to activate the new system software.

Figure5–14



CAUTION

- **Disconnect the monitor from the patient and ensure that important data are saved before upgrade.**
- **Do not shut down or power off the equipment when upgrading the boot program and FPGA program. Otherwise, the equipment may break down.**
- **Upgrade should be performed by qualified service engineer only. A potential hazard or unsafe practice indicated by the system that, if not avoided, could result in minor physical injury or product/property damage.**

NOTICE

- **After the boot program is upgraded, the system program and other programs must be upgraded again to ensure compatibility among them.**
- **Before upgrading, ensure that the upgrade package is of the target version. To get the latest program upgrade package, contact our Customer Service Department.**

5.8.5 Ultrasound Probe Software Upgrade

Preparing the Upgrade Directory Structure of USB Flash Disk

Tools:
Prepare a common USB flash disk (Kingston, Netac and other models) of which the system capacity is larger than 2 GB and choose the FAT format

1. Create a folder named UltraSoundProbeUpgradePath\i3p-20 in the root directory of the USB flash disk.
2. Copy the upgrade file to the directory UltraSoundProbeUpgradePath\i3p-20.

Connect the USB flash drive to the type C port of the device

Connect the prepared USB flash drive to the type C port next to the USB 3.0 port of the device (you can use a USB flash drive with type C port, or use a type C to USB data conversion cable).

Performing Upgrade

1. Plug the ultrasonic probe cable connector into the USB 3.0 port of the device to connect the ultrasonic probe.

2. At the bottom of the main interface, click "Ultrasound" to enter the ultrasonic inspection window, turn on the ultrasonic probe, and confirm that the device can display ultrasonic images normally.
3. Enter the machine menu:**Main Menu>Maintenance>Factory Maintenance>Setup>Updated Ultrasound Probe Version**,then complete the upgrade.

NOTICE

- **Files in the USB flash disk should be in the format of FAT32.**
- **The system software version of the defibrillator must be V01.08.00.01 or later.**
- **The software version of the expansion board of the defibrillator must be V01.05.00.01 or later.**
- **For more information, contact our Customer Service Department.**

5.9 Software Function Upgrade

5.9.1 Software Function Upgrade Overview

Some software functions of the monitor are controlled by the license. You can select these software functions when purchasing the monitor, or you can contact Mindray engineers to upgrade and activate these software functions after receiving the monitor.
The available upgrade items vary with countries and configurations of the monitor. This manual lists all software functions that can be upgraded. Some items may not be applicable to your monitor.

No.	Upgrade Description	Other Regions (International)	Mainland China (Domestic)
1	Pacing Function	√	√
2	Ultrasound Function (Without probe)	X	√
3	First Aid Training Mode	√	√
4	CPR Quality Index (CQI)	√	√
5	Glasgow Coma Score (GCS)	√	√
6	Early Warning Score (EWS)	√	√

No.	Upgrade Description	Other Regions (International)	Mainland China (Domestic)
7	Chest Pain Diagnostic Score (HEART)	√	√
8	Traumatic Brain Injury Assessment (TBI)	√	√

5.9.2 Preparation before Upgrading the Software Function

The following information is required for CAA license application:

1. Order number (with CAA functions to be applied for)
2. Model
3. SN
4. MID/MAC address (a long string of letters and digits. You can find the MID information in **Main Menu>System>Software License** of the monitor).

5.9.3 Software Function Upgrade

After receiving the software function upgrade license file sent to you by Mindray, you need to import the file into the monitor to complete the upgrade. Procedure:

1. Unzip the CAA license package PMLS.ZIP to obtain a folder named PMLS.
2. Copy the PMLS folder to the root directory of the USB flash disk.
3. Insert the USB flash disk with the PMLS folder to the USB port of the equipment.
4. On the equipment, choose **Main Menu>System>License>External**. On the page displayed, click Import.

NOTICE

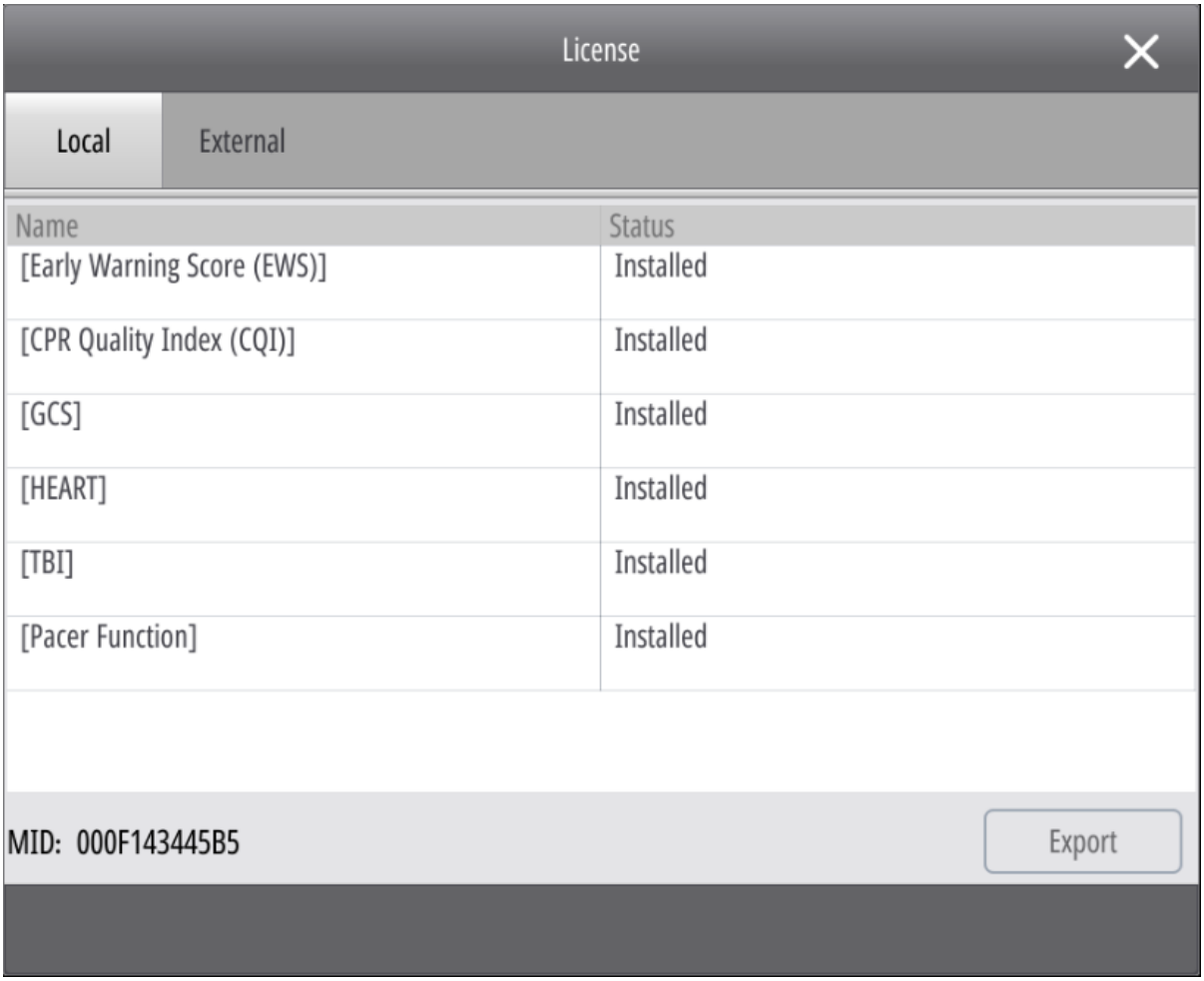
- **Files in the USB flash disk should be in the format of FAT32#.**
- **The folder containing the CAA license must be PMLS and stored in the root directory of the USB flash drive. The file name cannot be modified.**
- **For more information, contact our Customer Service Department.**

5.9.4 Test After Upgrade

After the software function upgrade is completed, follow the steps below to check:

On the monitor, choose **Main Menu>System>Software License>Local**. Check whether the state of the upgraded software function is **Installed**.

Figure5–15


License
Local
External
Name
Status
[Early Warning Score (EWS)]
Installed
[CPR Quality Index (CQI)]
Installed
[GCS]
Installed
[HEART]
Installed
[TBI]
Installed
[Pacer Function]
Installed
MID: 000F143445B5
Export

6 FRU Replacement

6.1 Preparation Before Disassembly

Tools: Phillips screwdriver, tweezers, and needle-nosed pliers

Preparations:

Before disassembling the equipment, do the following:

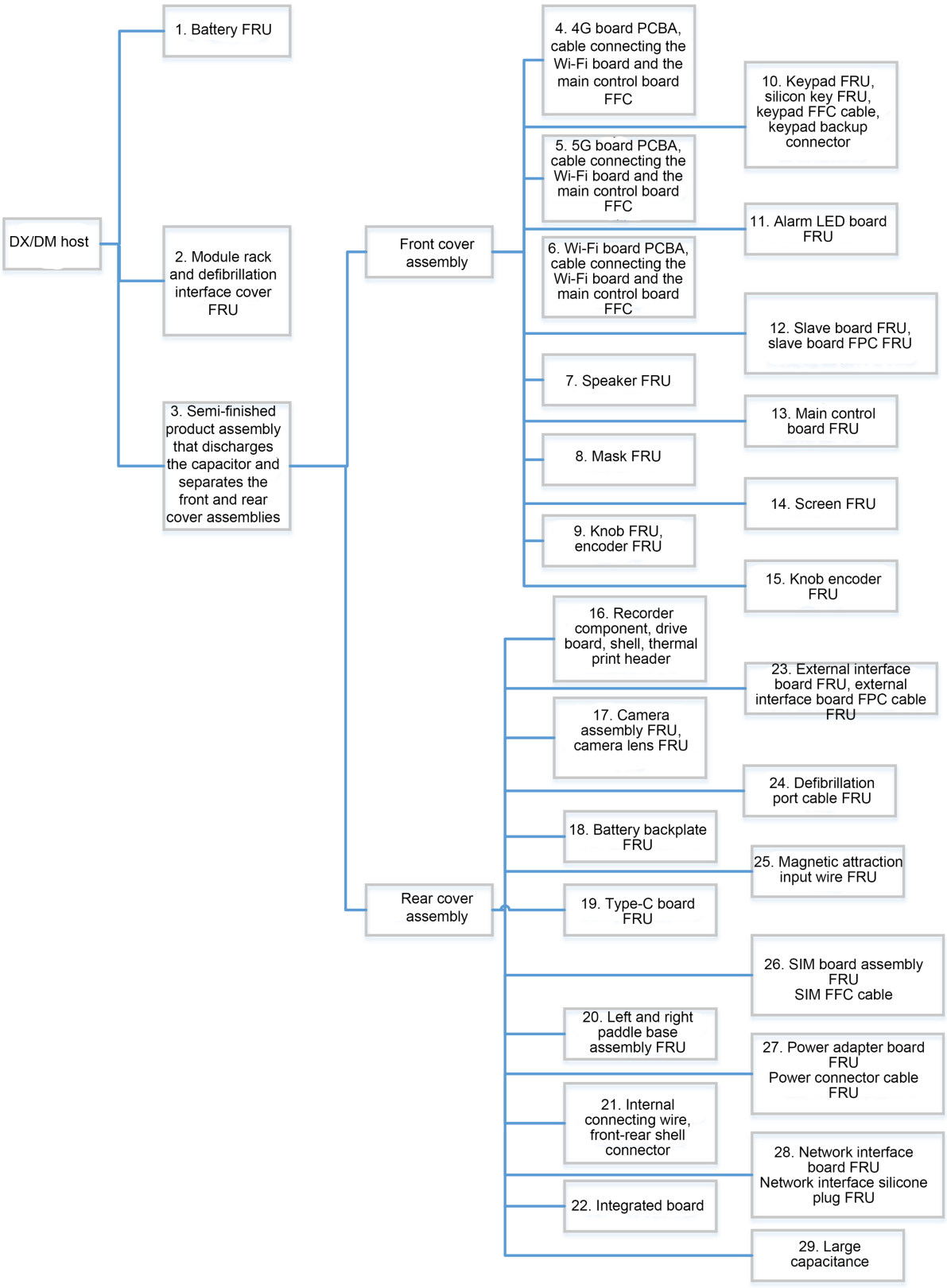
1. Stop patient monitoring and therapy, turn off the equipment, and disconnect all its accessories from external devices.
2. Disconnect the power supply.

⚠WARNING

- **Take ESD precautionary measures before starting the disassembly. Be sure to wear the ESD bracelet or ESD gloves before touching the parts identified with the ESD warning symbol to avoid parts damage.**
- **When re-assembling the equipment, ensure that all cables are reliably connected. Place the connectors properly to avoid short circuit caused by crushing connectors.**
- **When re-assembling the equipment, ensure that right screws are used. Screwing improper screws by force may damage the equipment. Furthermore, using improper screws may cause the screws or parts fall off unexpectedly in use, hence leading to unforeseeable physical injury or property damage.**
- **Disassemble the equipment in the correct sequence. Incorrect disassembly by force may damage the equipment permanently.**
- **Before disassembling the components, ensure that all the connected parts have been disconnected. Exercise care during the disassembling process. Do not break the cables or damage the connectors.**
- **Be sure to classify the removed screws and parts and store them carefully for re-assembly. Do not damage, contaminate or lose any screw or part.**
- **Place removed parts by module to avoid mixing or missing during re-assembly.**
- **During re-assembly, assemble components before assembling the main unit. Insert the connectors and wire the cables properly.**
- **The equipment must be water-proofing. During re-assembly, check whether waterproof accessories such as the waterproof strips are assembled properly.**

6.2 Disassembly Flowchart

Figure6–1

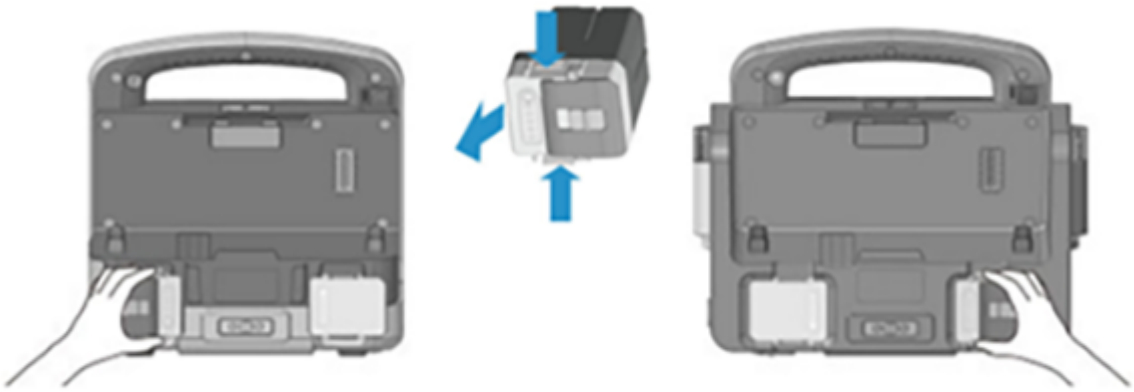


6.3 Capacitor Removal

Method 1

Disconnect the AC power cable and remove the battery. Leave the machine still for more than two hours before disassembling it.

Figure6–2

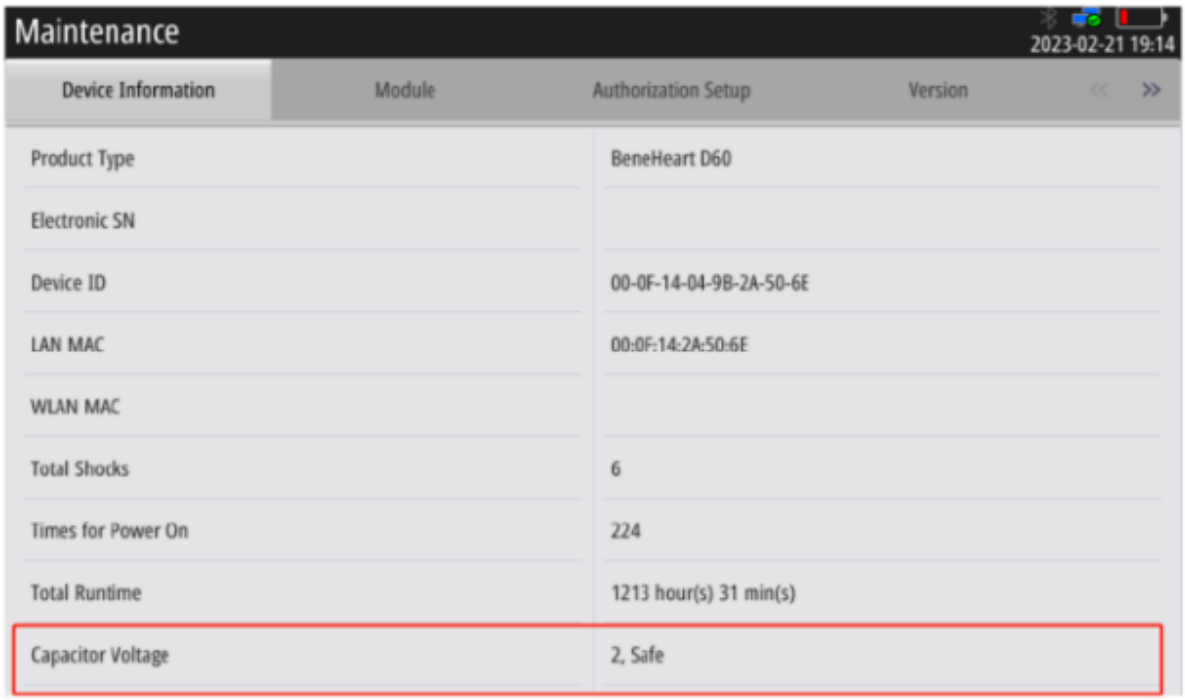


Method 2

Precondition: The device can boot normally.

1. Choose **Main Menu>Maintenance>Version>Device Information**.
2. Check the **Capacitor Voltage**.

Figure6–3



3. If the capacitor voltage is safe, turn off the device, disconnect the power supply, and disassemble the device.
4. If the capacitor voltage is unsafe, do not disassemble the device. See method 1 for details.

6.4 Main Unit Disassembly

Preparation Before Disassembly

Tools: Crosshead screwdriver, needle nose pliers, tweezers

Preparations:

Before disassembling the equipment, do the following:

1. Stop patient monitoring and therapy, turn off the equipment, and disconnect all its accessories from external devices.
2. Disconnect the power from the adapter.

⚠WARNING

- **To disassemble the defibrillator/monitor, remove the battery, handle assembly, electrode base assembly, and front cover assembly in sequence, and then remove the components or parts inside the machine.**
- **Place the removed components on a smooth plane without any objects that may scratch the anti-glare screen and touch screen or damage the knob.**
- **All operations must be performed by professionals. Wear insulating gloves during the operations.**
- **Before disassembling the defibrillation therapy device, the capacitor must be discharged using a discharge tool. For details about the discharge operation, see 6.3 Capacitor Removal. If there is no discharge tool, disconnect the AC power cable and remove the battery. Leave the machine still for more than two hours before disassembling the capacitor.**

Disassembly Steps

1. ### Remove the portable kit assembly

   Press the unlock button on the main unit and remove the portable kit assembly.

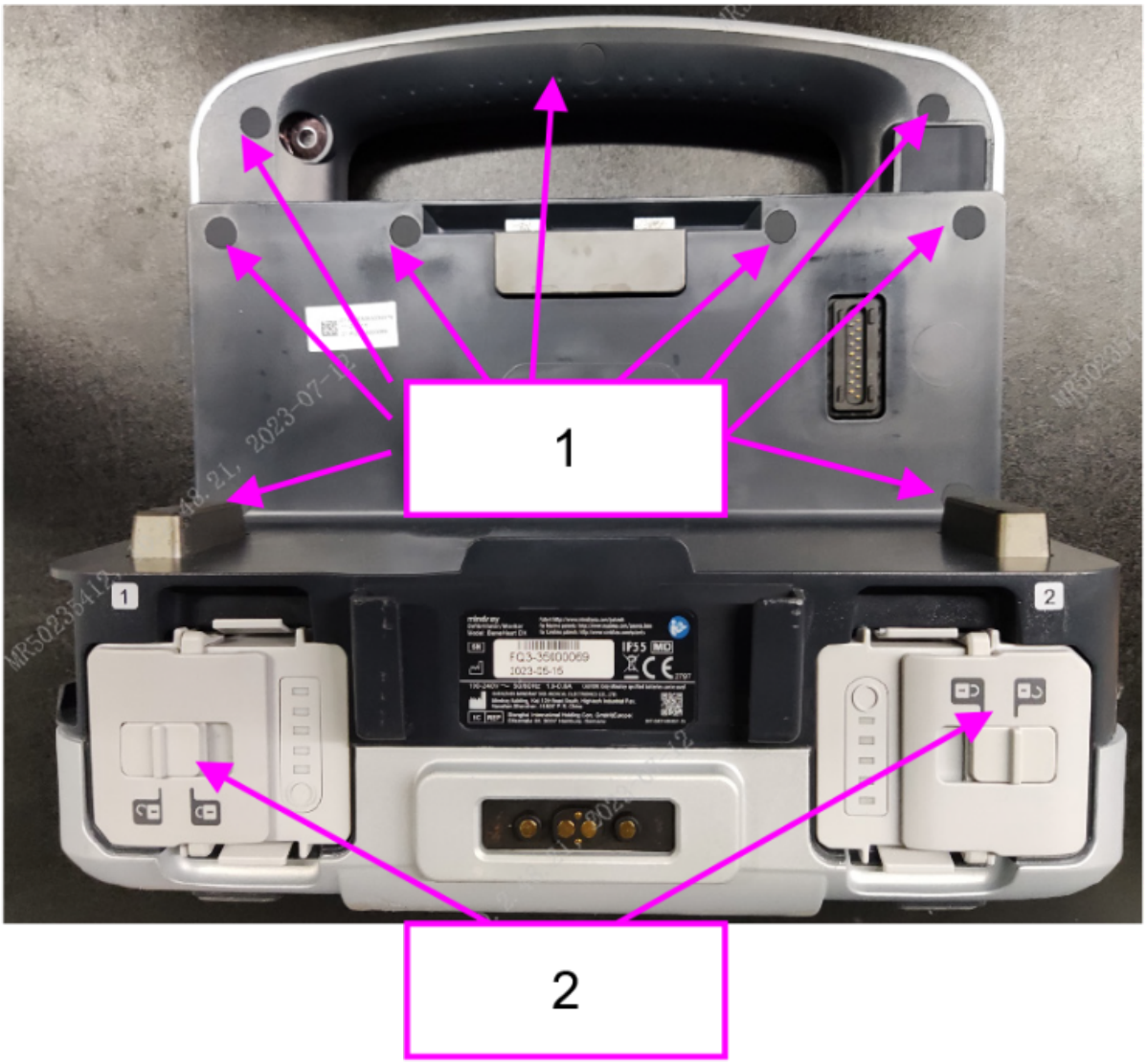
Figure6–4

1 Unlocking knob

2. **Remove the battery and rubber stopper**

   Move the retaining lock of the battery to the unlock position, pinch the buckles on both sides of the battery, and take out the battery.

Figure6–5



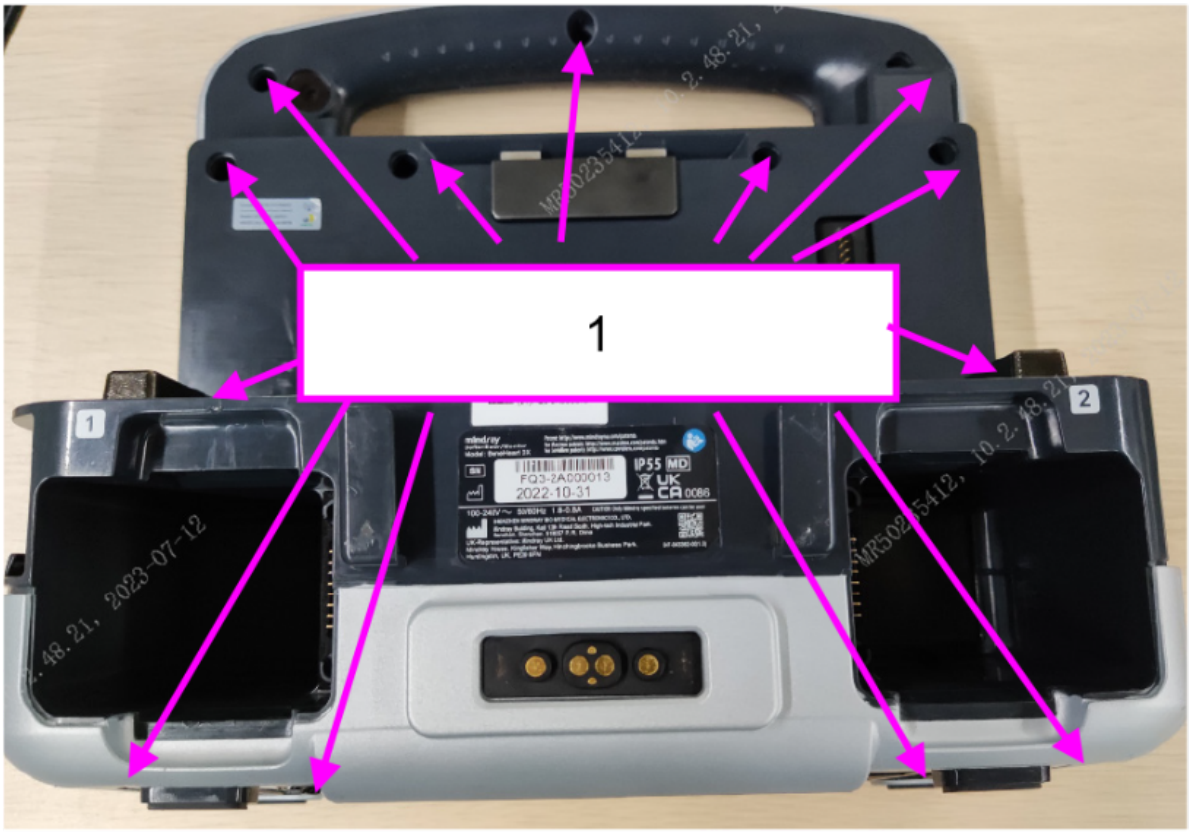
1 Rubber stoppers of the screw

2 Take out the battery.

3. Separating the Front and Rear Cover Assemblies

1) Use a Phillips screwdriver to remove 13 M3X12 screws with washers on the back of the main unit.

Figure6–6



1 13 M3X12 screws with washers

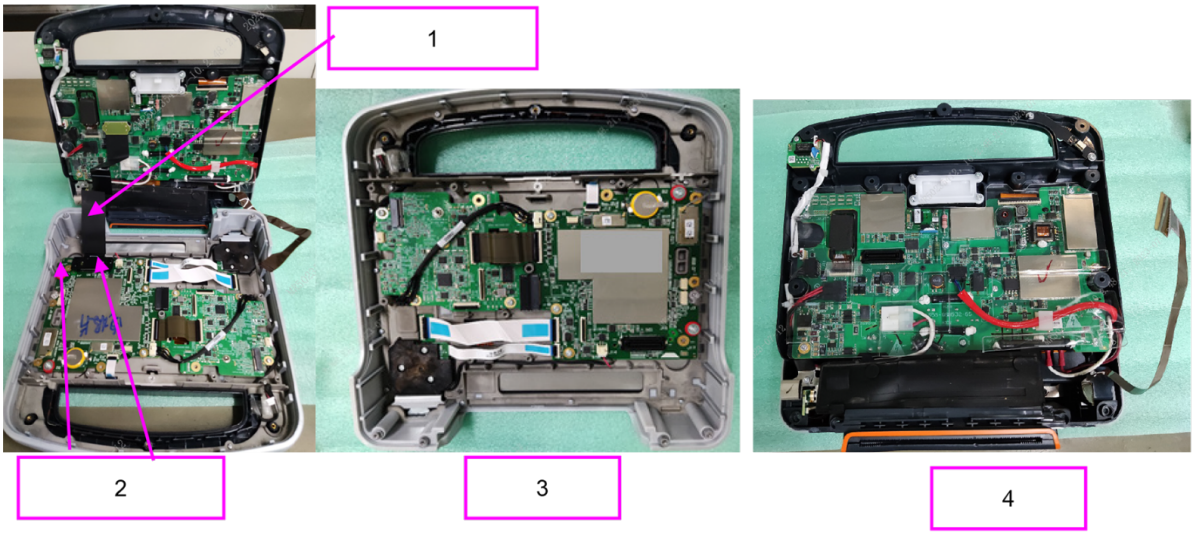
2) Open the front and rear shells of the equipment. Note: If there is a camera, when separating the front and rear shells, pull out the camera cable first. Then, pull out the TYPE-C FPC cable.

Figure6–7

1 Camera Cable
2 TYPE-C FPC Cable

3) Unplug the front and rear shell connection cables from the integrated board and separate the front and rear shells. Pull out two black nylon rivets, remove the one black socket cover on the front shell, and pull out the front and rear shell connection cables.

Figure6–8



1	Two black nylon rivets
2	Front Cover Assembly
3	Rear Cover Assembly
4	Front-rear shell connector

4. Capacitor Removal

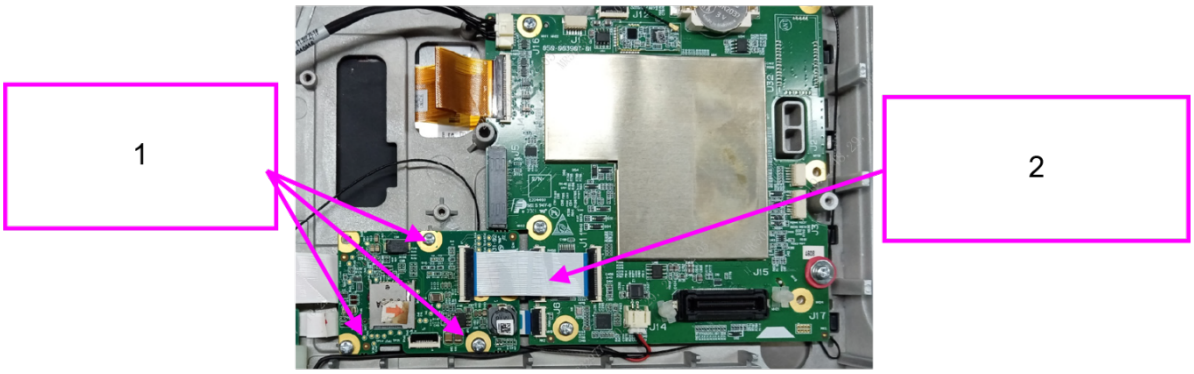
NOTICE

After shutting down the equipment normally, disconnecting the external power supply and unplugging the battery, let it stand for more than 2 hours, and wait for the energy of the energy storage capacitor to be completely released. Disassemble the semi-finished components of the front and rear shells.

5. Removing and replacing the 4G carrier board PCBA and cable between wireless carrier board and main control FFC (4G configuration)

Use a crosshead screwdriver to remove three M3X6 cross recessed pan head screws on the 4G carrier board. Remove the cable between wireless carrier board and main control FFC. Take out the 4G carrier board, and remove the 4G antenna from the bottom of the 4G carrier board.

Figure6–9



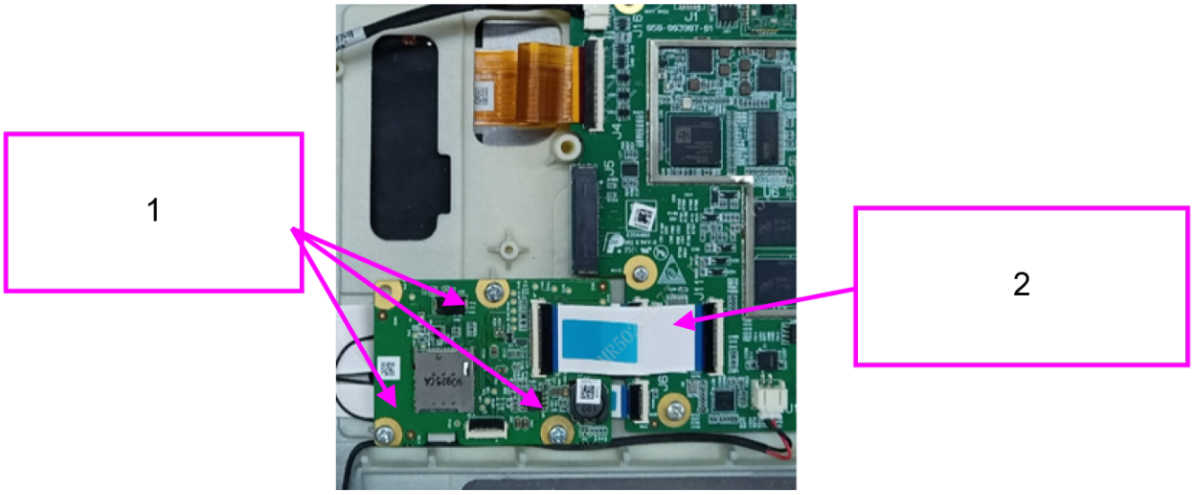
1 Three M3X6 pan head screws

2 Connection cable from the wireless carrier board and main control board FFC

6. **Removing and replacing the 5G carrier board PCBA and cable between wireless carrier board and main control FFC (5G configuration)**

Use a crosshead screwdriver to remove three M3X6 cross recessed pan head screws on the 5G carrier board. Remove the cable between wireless carrier board and main control FFC. Take out the 5G carrier board, and remove the 5G antenna from the bottom of the 5G carrier board.

Figure6–10



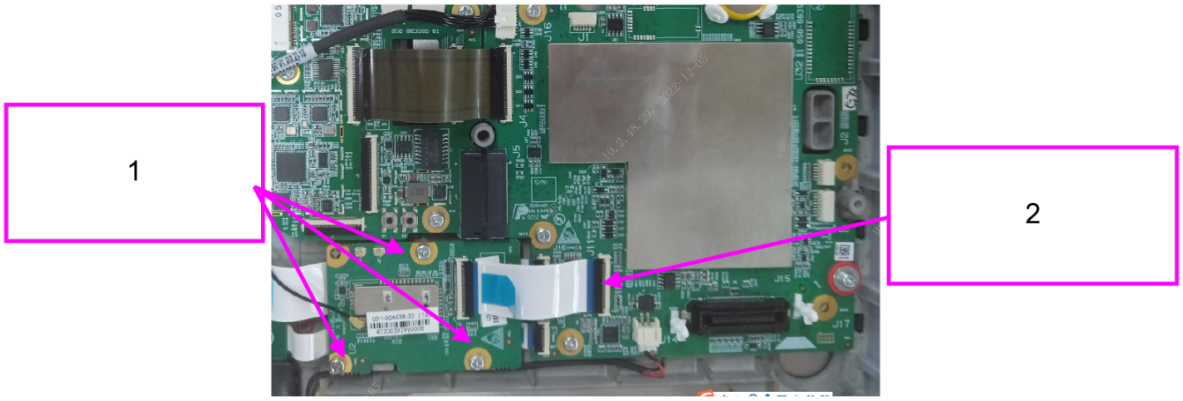
1 Three M3X6 pan head screws

2 Connection cable from the wireless carrier board and main control board FFC

7. **Removing and replacing Wi−Fi carrier board PCBA and cable between wireless carrier board and main control FFC (Wi−Fi configuration)**

Use a crosshead screwdriver to remove three M3X6 cross recessed pan head screws on the Wi-Fi carrier board. Remove the cable between wireless carrier board and main control FFC. Remove the Wi-Fi antenna from the Wi-Fi carrier board, and take out the Wi-Fi carrier board.

Figure6–11



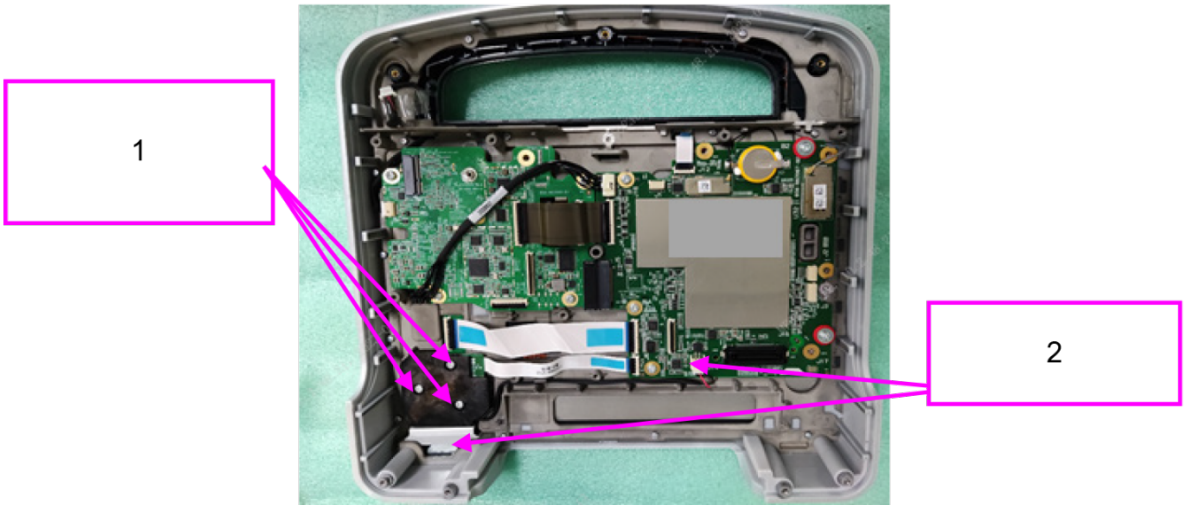
1 Three M3X6 pan head screws

2 Connection cable from the wireless carrier board and main control board FFC

8. **Removing and replacing the speaker**

Use a crosshead screwdriver to remove the three M3X6 cross recessed pan head screws on the encoder gland, remove the encoder gland, remove the speaker cable from the main control board, and disassemble the speaker assembly.

Figure6–12



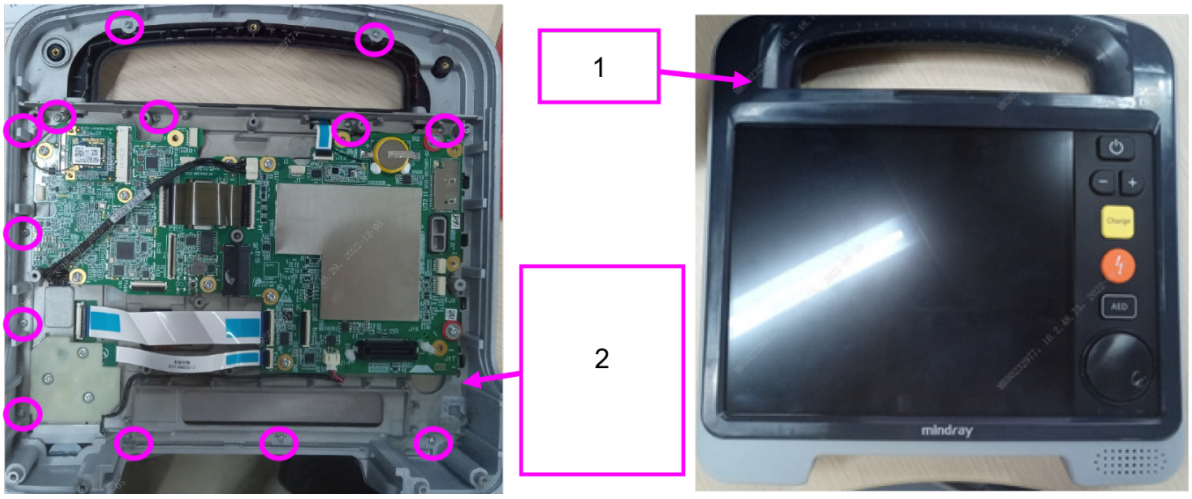
1 Three M3X6 pan head screws

2 Removing the speaker

9. **Removing and replacing the front shell mask**

Use a crosshead screwdriver to remove 13 PT2.6X8 self-tapping screws, and then remove the front shell mask.

Figure6–13



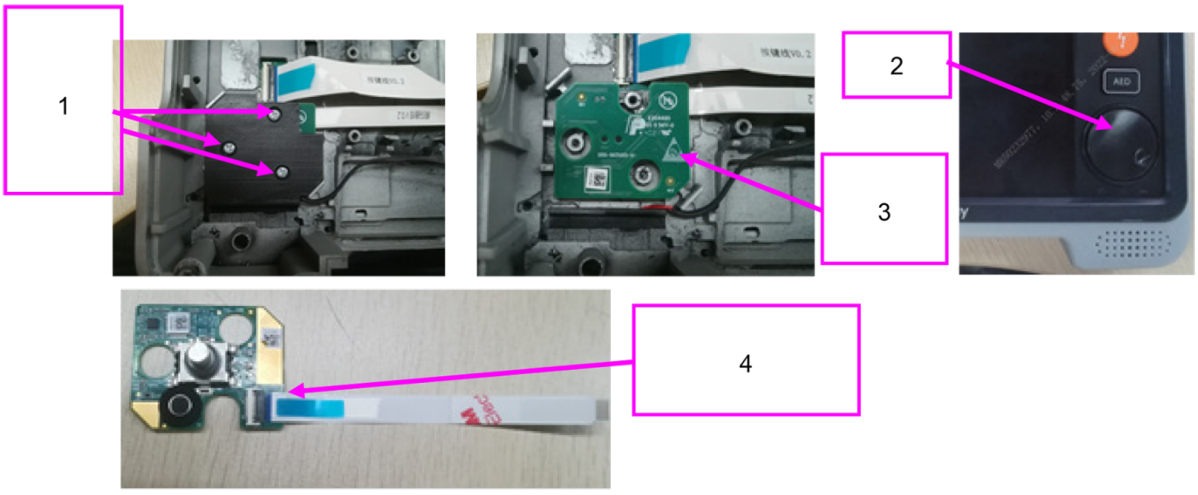
1 Mask

2 13 PT2.6X8 self-tapping screws

10. **Removing and replacing the knob, encoder board PCBA, and encoder board FFC cable**

Use a crosshead screwdriver to remove the three M3X6 cross recessed pan head screws on the encoder gland, and remove the encoder gland. Remove the encoder board PCBA and knob, and disassemble the encoder FFC cable from the encoder board.

Figure6–14



1 3 M3X6 screws

2 Knob

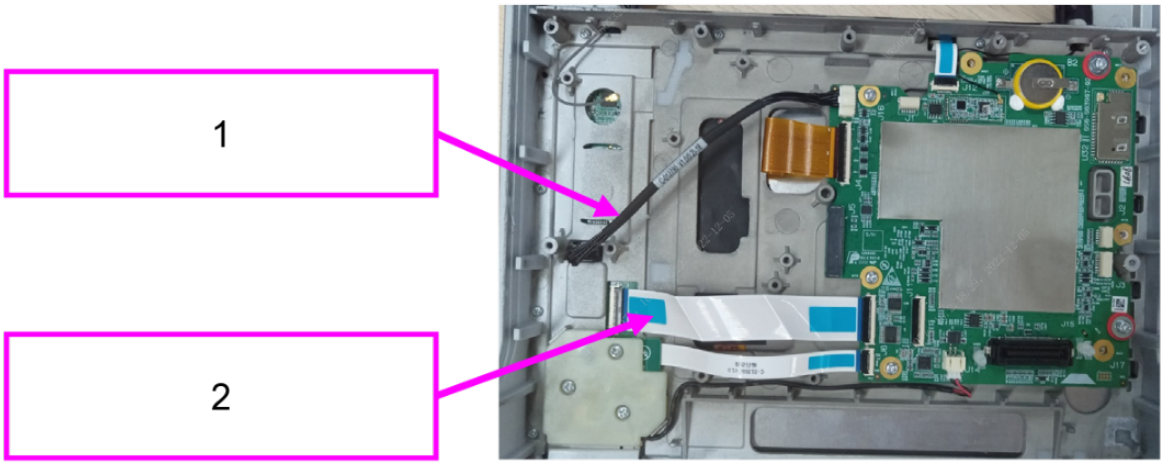
3 Encoder board

4 Encoder board FFC cable

11. **Disassembling and replacing silicone keys, keypad PCBA, keypad FFC cable, and keypad backup connector**

1) Disassemble the FFC connector of the keypad and the backup connector of the keypad

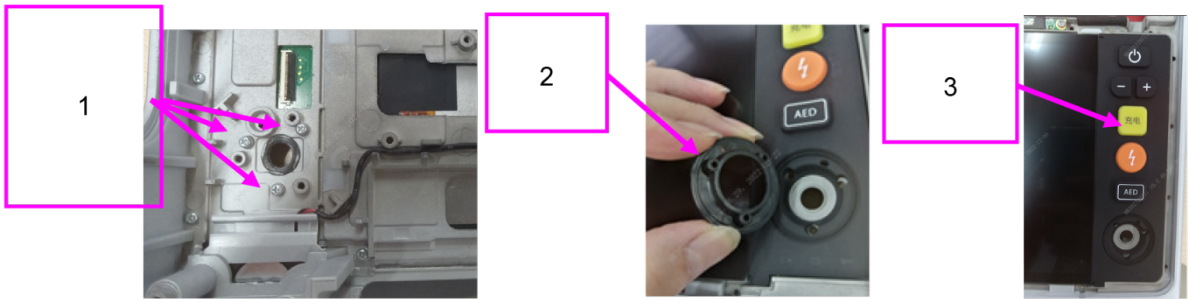
Figure6–15



1	Keypad Backup Connector
2	Keypad FFC Connector

2) Use a crosshead screwdriver to remove 3 PT2.6X8 self-tapping screws, remove the knob bracket, and remove the silicone keys.

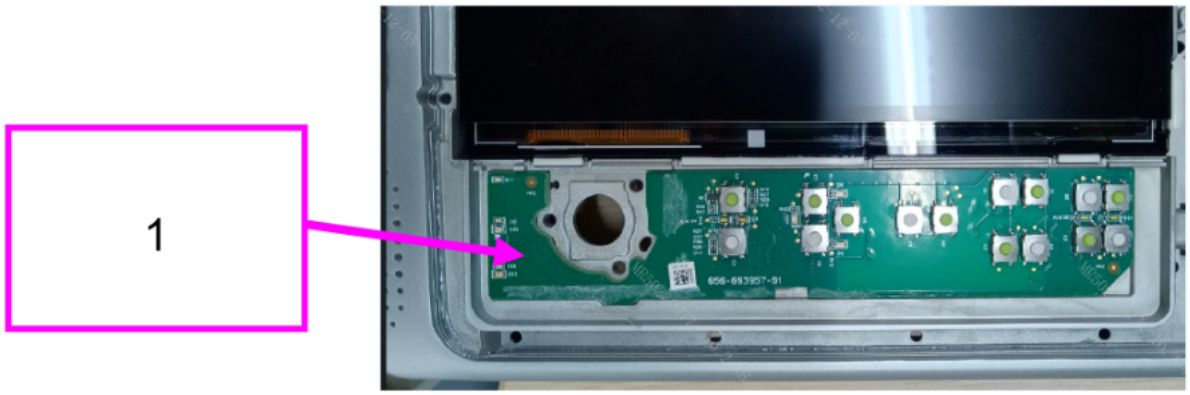
Figure6–16



1	13 PT2.6X8 self-tapping screws
2	Knob bracket
3	Silicon key

3) Remove the keypad PCBA.

Figure6–17



1 Keypad PCBA

12. Removing and replacing the alarm lamp board PCBA

Use a crosshead screwdriver to remove the two M3X6 cross recessed pan head screws from the alarm lamp board and then remove the alarm lamp board and the alarm lamp board FFC cable.

Figure6–18

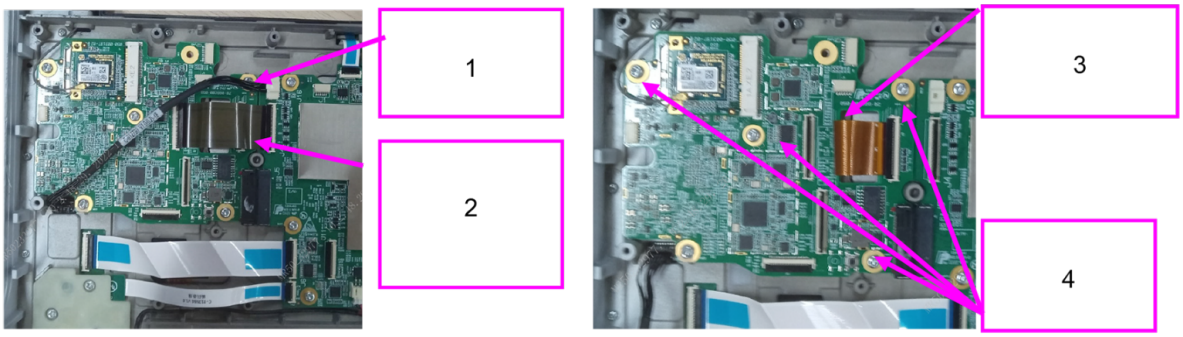
1 2 M3X6 screws

2 Alarm lamp FFC cable

13. Removing and replacing the slave processor board PCBA, cable from slave processor board to main control board FPC, and camera connection cable (when the ultrasound function is configured)

1) Remove the cable from slave processor board to main control board FPC and the keypad backup connector. Use a crosshead screwdriver to remove five M3X6 cross recessed pan head screws from the processor, remove the display cable, and then remove the slave processor board.

Figure6–19



1 Keypad Backup Connector

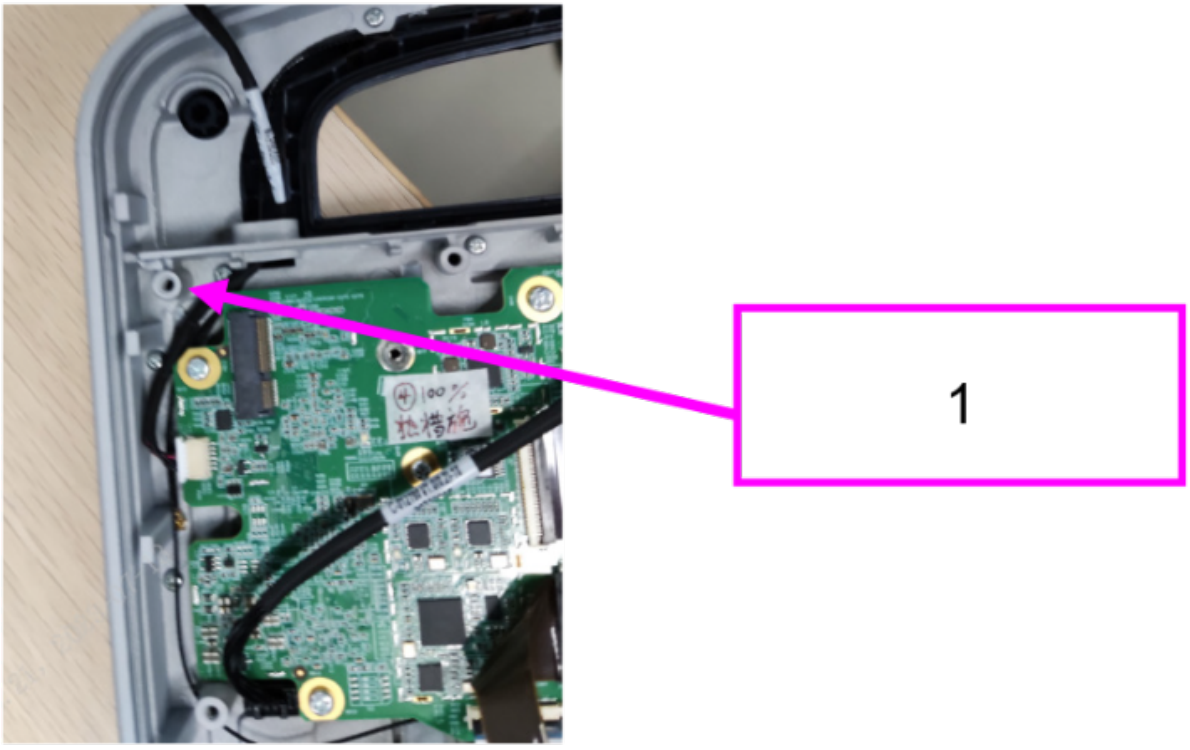
2 Cable from slave processor board to main control board FPC

3 Display cable

4 Five M3X6 pan head screws

2) When a camera is configured, unplug the camera cable from the board socket.

Figure6–20



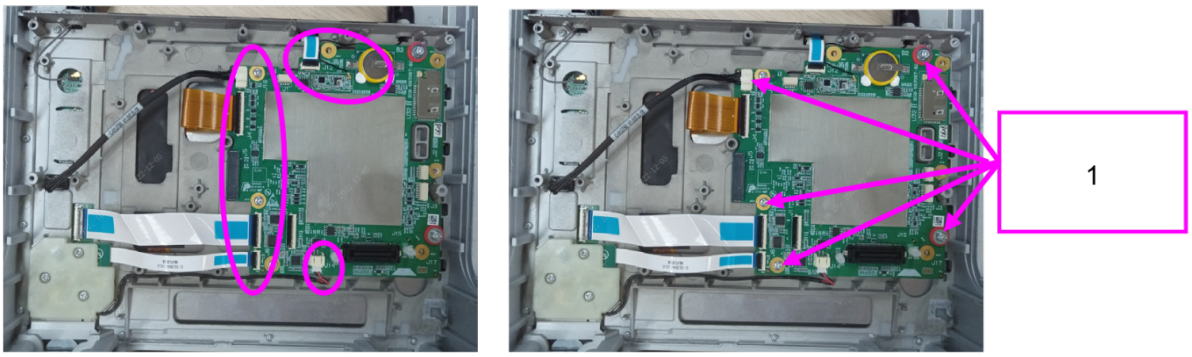
1 Camera Cable

14. **Disassembling and replacing the main control board PCBA**

Disassemble the connectors of boards, cables, speakers, antennas, etc. connected to the main control board. When the slave processor board is not configured, remove the display cable.

Use a crosshead screwdriver to remove five M3X6 cross recessed pan head screws on the main control board. Remove the main control board.

Figure6–21

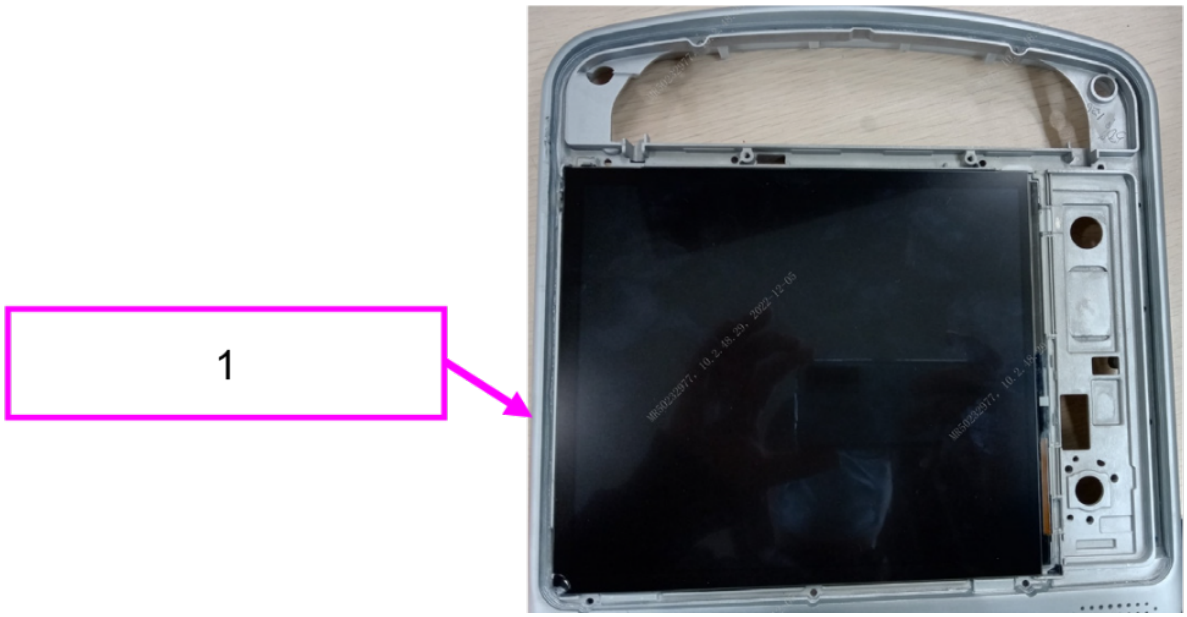


1 Five M3X6 pan head screws

15. Disassembling and replacing the touch screen assembly

According to the previous steps, disassemble all the components on the front cover assembly. Then, reassemble the disassembled components to the new screen assembly.

Figure6–22

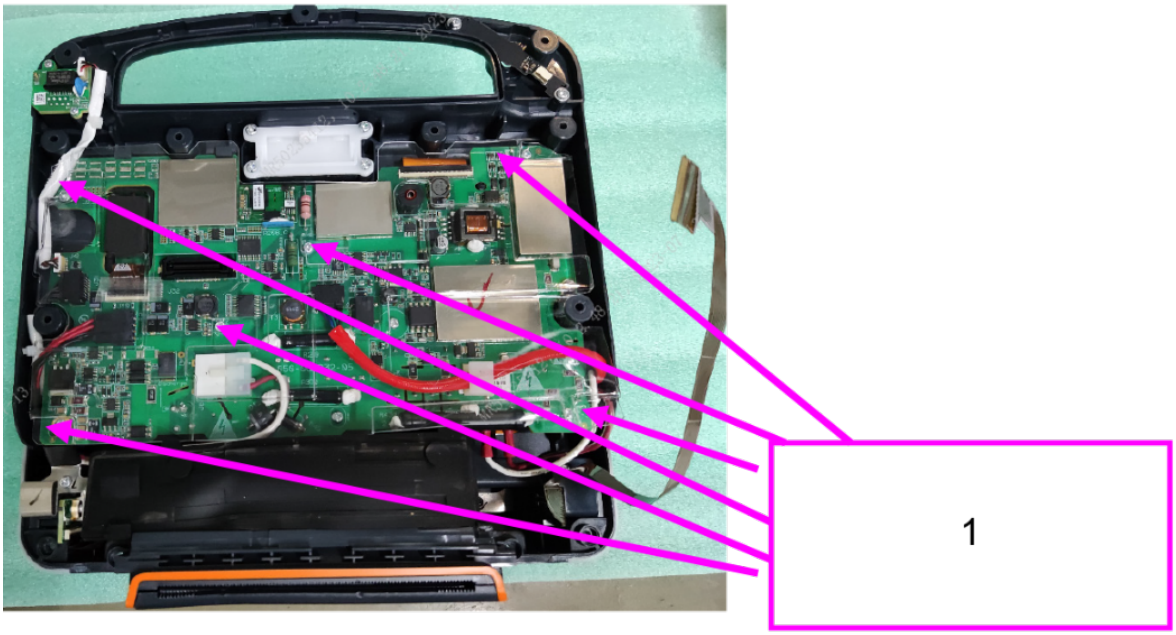


1 Touch Screen Assembly

16. Disassembling and replacing the integrated board of DX rear shell and insulation sheet of DX integrated therapy board

1) Use a crosshead screwdriver to remove six M3X8 cross recessed pan head screws that secure the insulation sheet, and then remove the insulation sheet assembly.

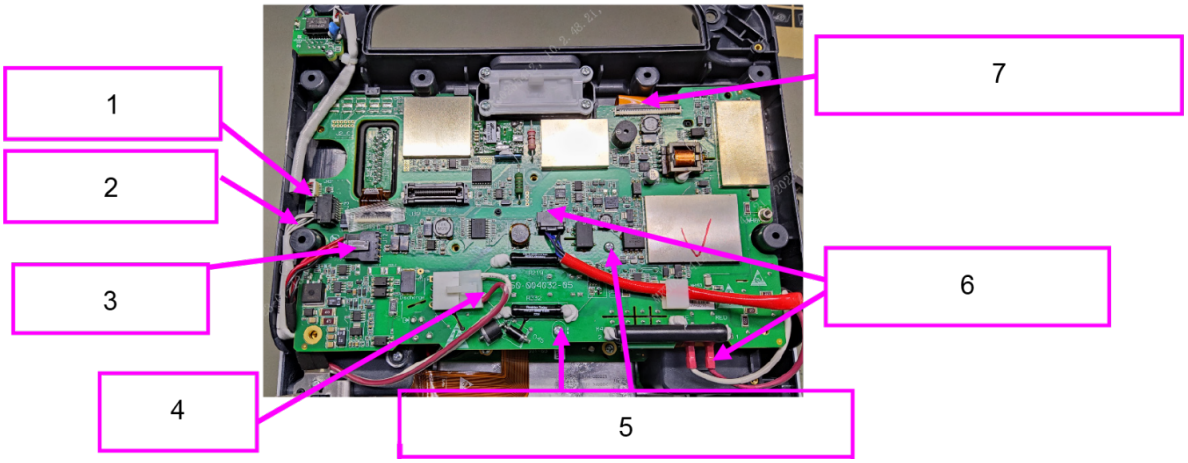
Figure6–23



1 Touch Screen Assembly

2) Use a crosshead screwdriver to remove two M3X8 cross recessed pan head screws that secure the integrated board, and remove the magnetic terminal cable, network interface cable, recorder cable, DC input cable of defibrillator DX power parameter board, capacitor cable, internal cable of defibrillation port and DX power conversion to integrated therapy board, unplug the terminals from the integrated board, and remove the integrated board.

Figure6–24



1 Network Interface Cable
2 Recorder Cable
3 DC Input Cable of Defibrillator DX Power Parameter Board
4 Capacitor Cable

5	Two M3X8 cross recessed pan head screws
6	Internal cable of defibrillation port
7	DX Power Conversion to Therapy Board

3) If the paddle host is configured, use a crosshead screwdriver to remove one M3X6 crosshead pan head combination screw that fixes the in-position detection cable.

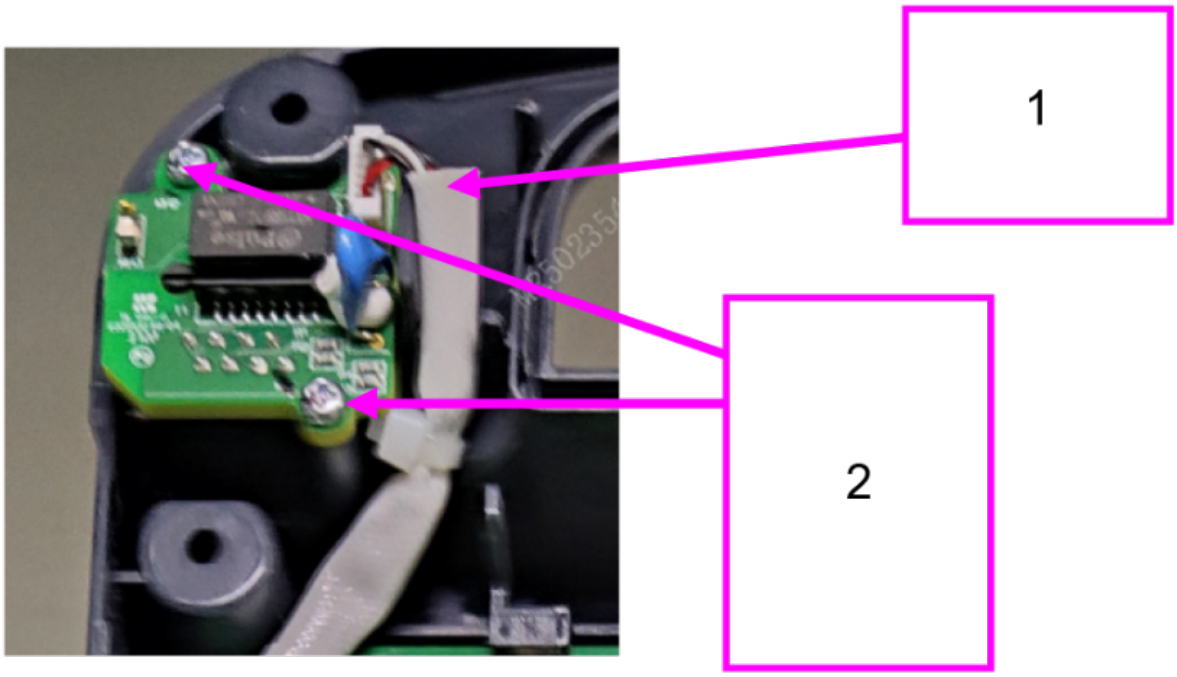
Figure6–25

1	In-position Detection Cable
2	One M3X6 crosshead pan head combination screw

17. Disassembling and replacing the DX network interface board PCBA and DX network interface cable

Use a crosshead screwdriver to remove the two PT2.6X8 self-tapping screws that fix the interface board. Remove the DX network interface cable from the board socket.

Figure6–26



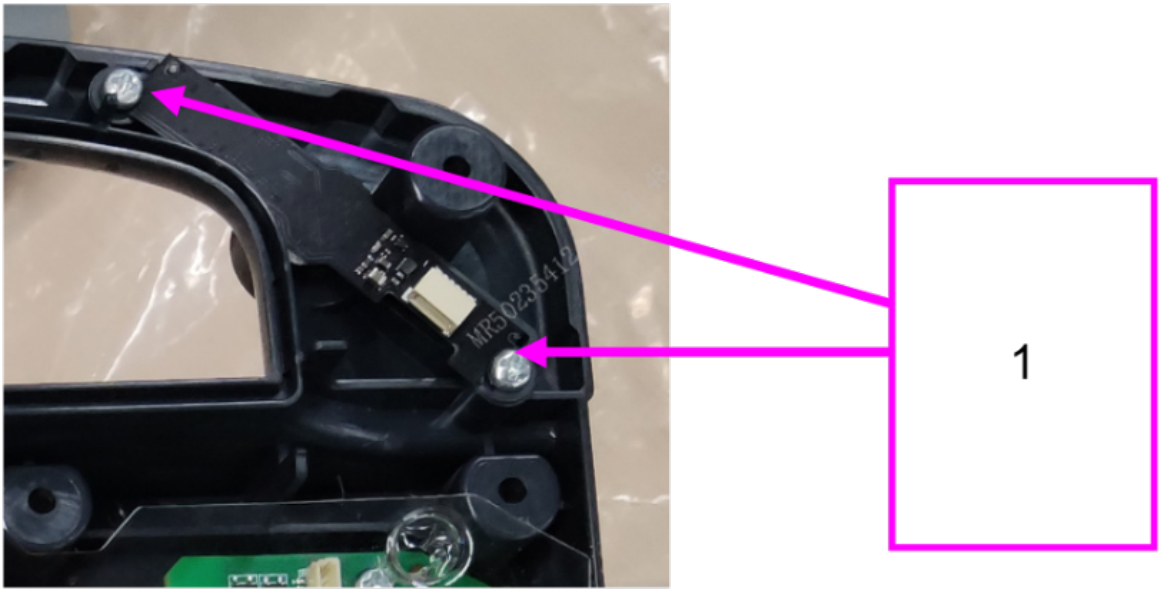
1 DX Network Cable

2 2 PT2.6X8 self-tapping screws

18. Disassembling and replacing camera assembly and camera lens (including adhesive) (with camera)

1) Use a crosshead screwdriver to remove the two M3X6 screws with washers that fix the camera module.

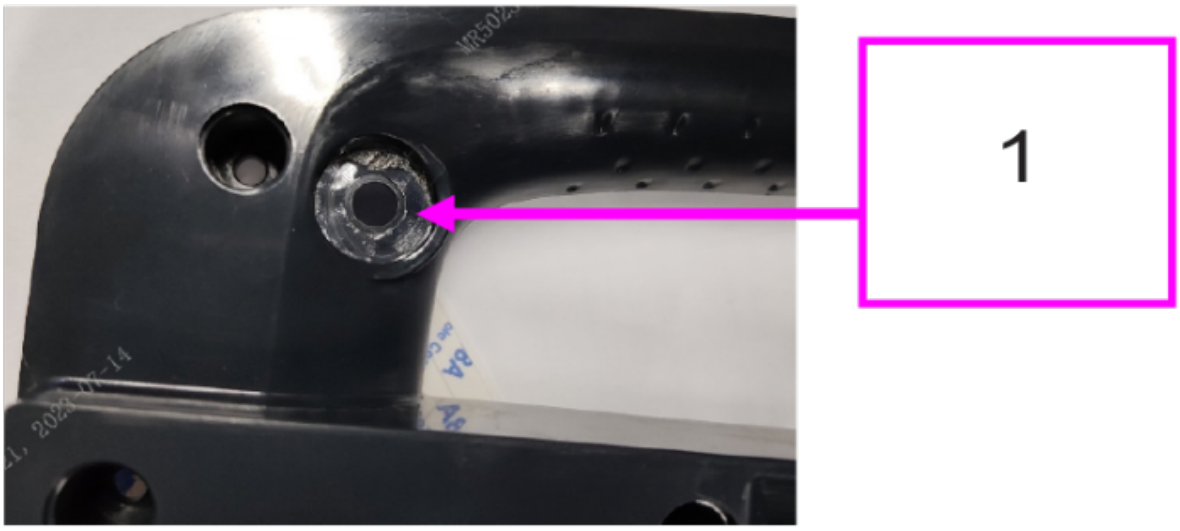
Figure6–27



1 Two M3X6 screws with washers

2) Use tweezers to remove the camera lens.

Figure6–28

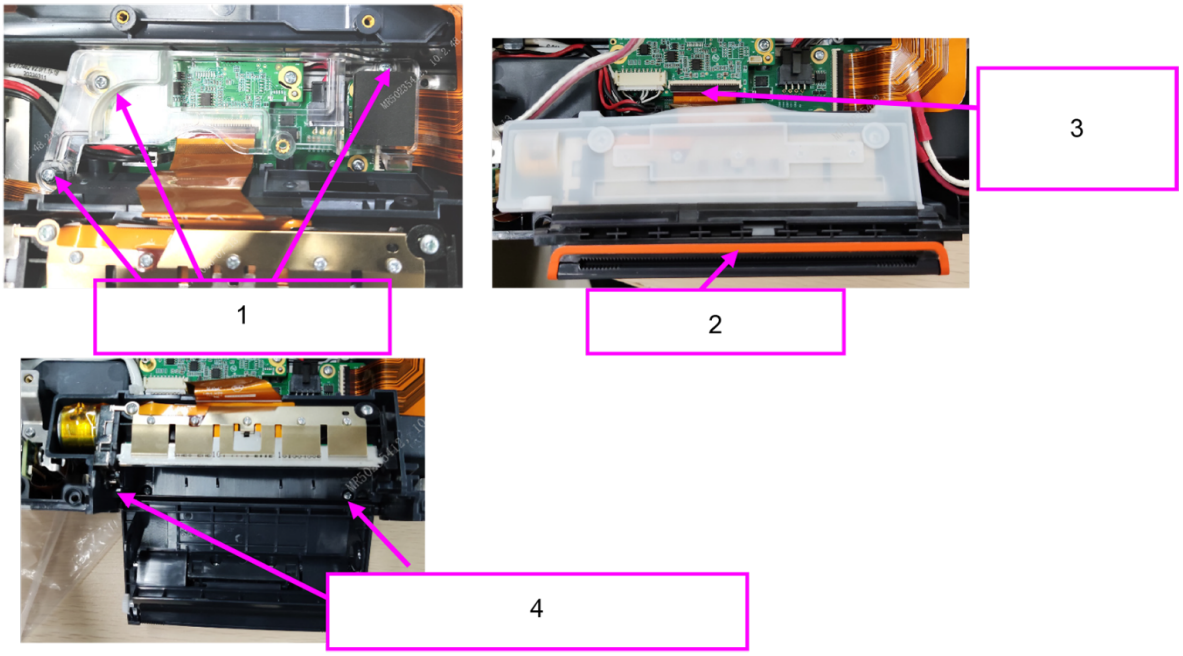


1 Camera lens

19. Disassembling and replacing the recorder assembly, recorder print head, and SIM board assembly

1) Use a crosshead screwdriver to remove the three M3X6 cross recessed pan head screws that fix the capacitor bracket, and remove the pin of the recorder. Pull out the recorder FPC from the board. Open the door of the recorder, and use a crosshead screwdriver to remove the two M3X8 cross recessed pan head screws that fix the recorder assembly.

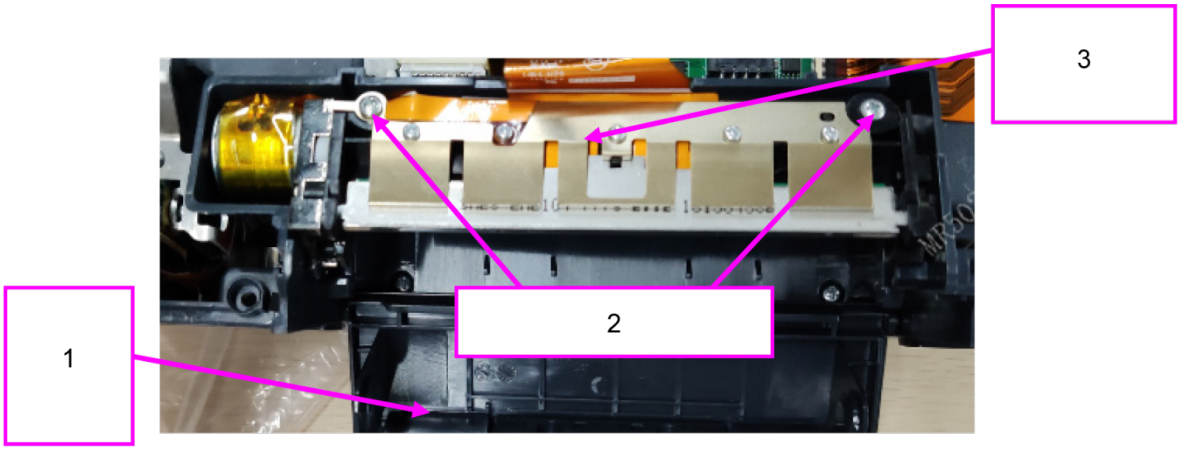
Figure6–29



1	Three M3X6 cross recessed pan head screws
2	Removing the recorder pin
3	Pulling out the recorder FPC from the board
4	Two M3X8 cross recessed pan head screws

2) Use a crosshead screwdriver to remove the two PT3X8 crosshead pan head self-tapping screws that fix the recorder drive board. Remove the print head of the recorder. Disassemble the roller of the thermal print head.

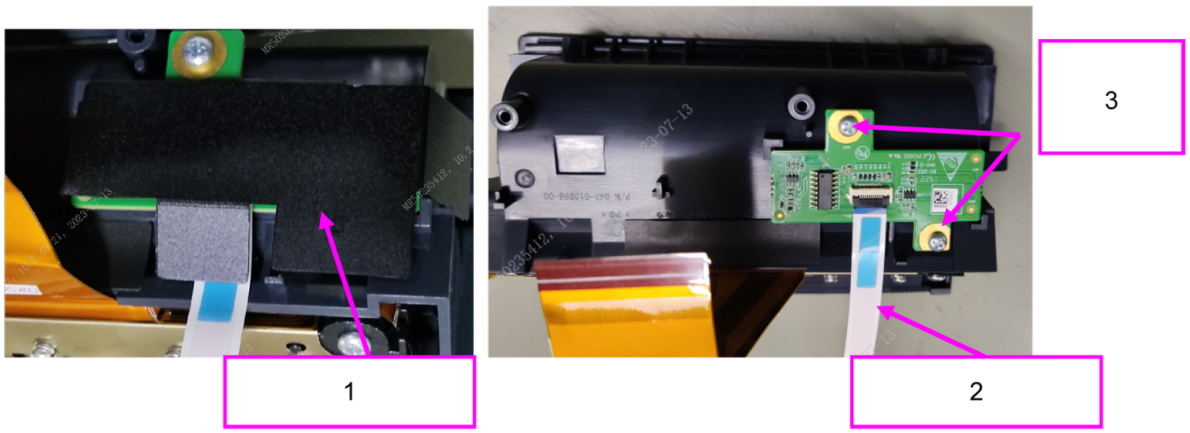
Figure6–30



1	Roller of the thermal print head
2	Two PT3X8 self-tapping screws
3	Print head of the recorder

3) Remove the SIM insulation sheet, and use a crosshead screwdriver to remove the two PT3X8 crosshead self-tapping screws on the SIM board. Remove the SIM board and connection cable from the SIM board to the wireless module FFC. (When 4G or 5G functions are configured)

Figure6–31

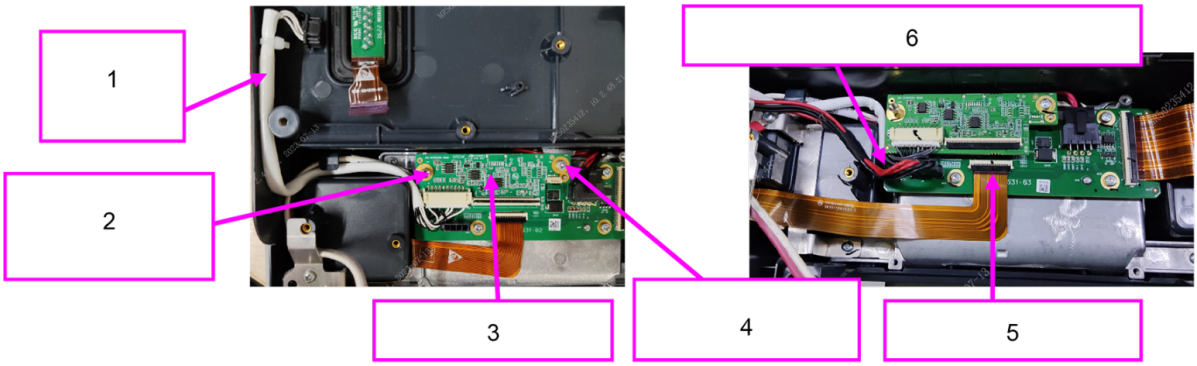


1 SIM Insulation Sheet
2 SIM Board Connection Cable
3 Two PT3X8 self-tapping screws

20. Disassembling and replacing the recorder drive board, recorder cable, and DC input cable of defibrillator DX power parameter board

Use a crosshead screwdriver to remove one M3X6 cross recessed pan head screw that fixes the recorder drive board. Use needle-nose pliers to remove one M3X6 stud screw that fixes the recorder drive board. Remove the recorder drive board and recorder cable. Remove the DC input cable of defibrillator DX power parameter board and remove the external interface FPC cable.

Figure6–32

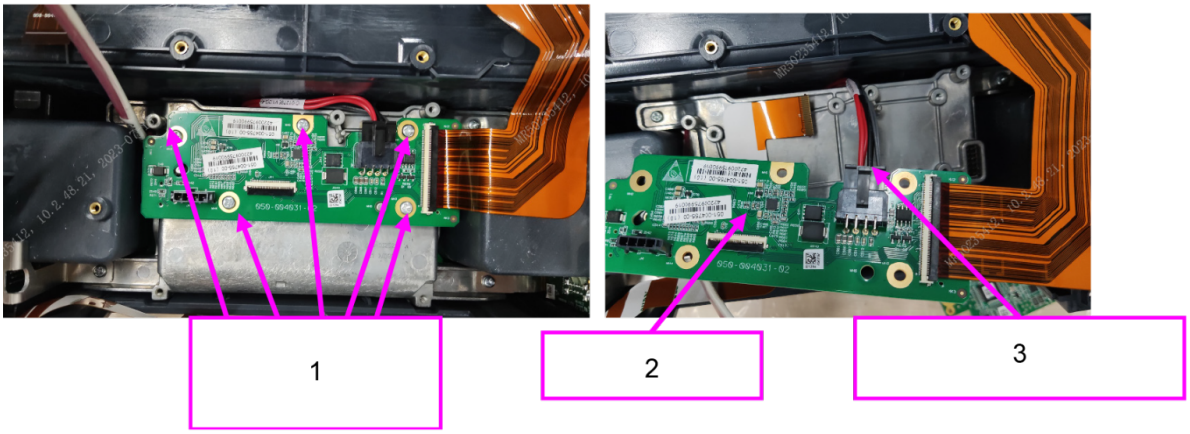


1 Recorder Cable
2 One M3X6 stud screw
3 Recorder drive board
4 One M3X6 cross recessed pan head screw
5 External interface FPC board
6 DC Input Cable of Defibrillator DX Power Parameter Board

21. Disassembling and replacing the power adapter board, DX power conversion to therapy board, and insulation sheet of DX power conversion to therapy board

1) Use a crosshead screwdriver to remove five M3X6 cross recessed pan head screws that secure the power adapter board. After pulling the board upwards from the metal bracket, pull out the magnetic terminals from the board socket.

Figure6–33



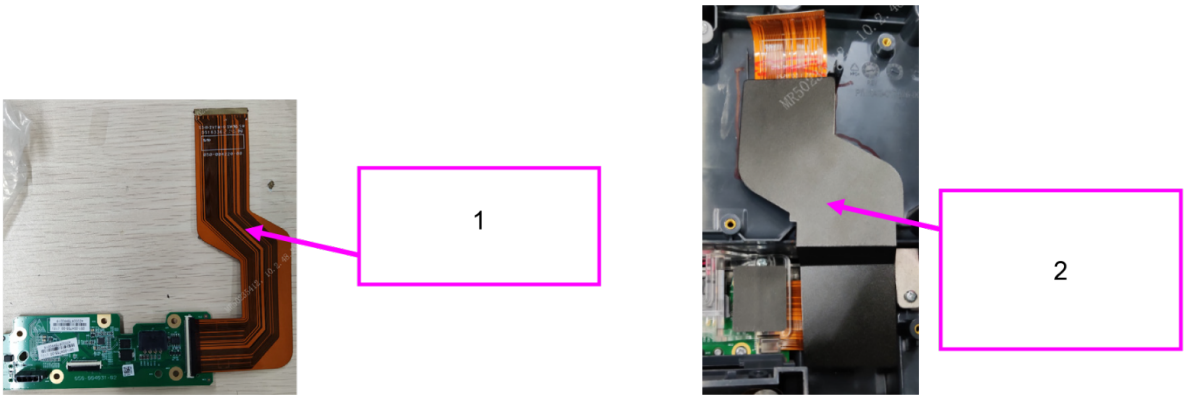
1 Five M3X6 cross recessed pan head screws

2 Power Adapter Board

3 Pulling out the magnetic terminals from the board socket

2) Remove the Insulation Sheet of DX Power Conversion to Therapy Board.

Figure6–34



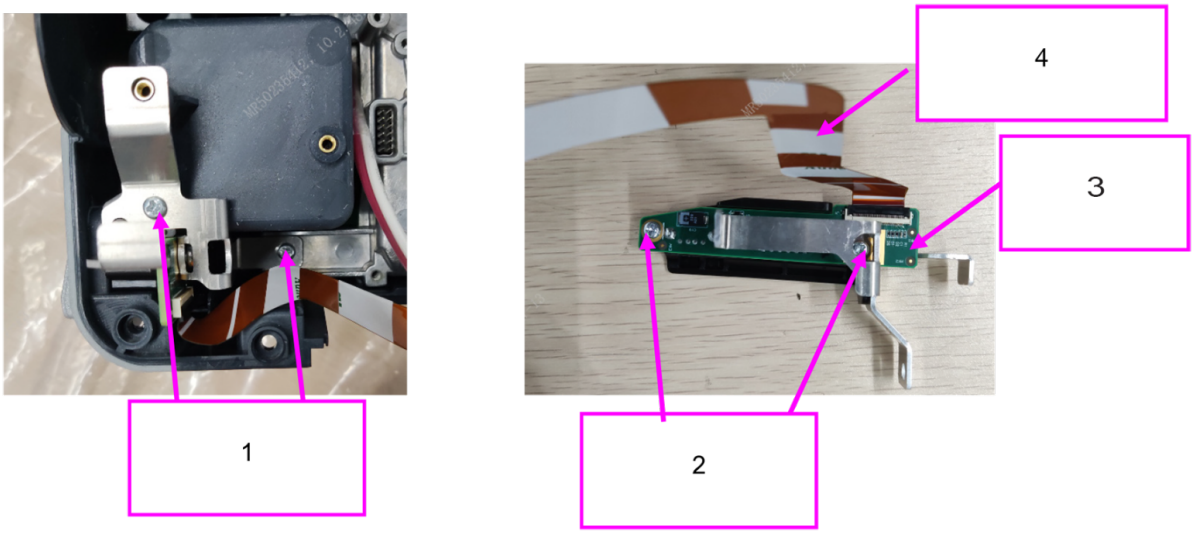
1 DX Power Conversion to Therapy Board

2 Insulation Sheet of DX Power Conversion to Therapy Board

22. Disassembling and replacing the DX external interface board assembly (pad host)

Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the I/O interface assembly, and then remove the I/O interface assembly. Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the I/O interface assembly, and then remove the I/O interface sheet metal bracket. Remove the cable connecting the external interface board and battery connect board FPC.

Figure6–35

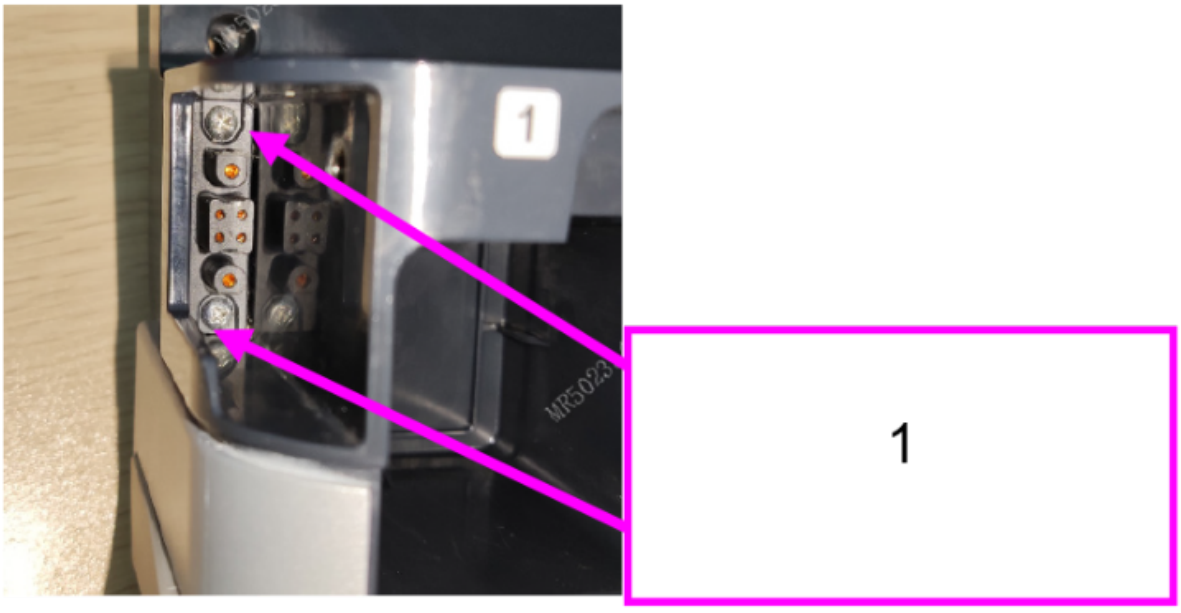


1	Two M3X6 cross recessed pan head screws
2	Two M3X6 cross recessed pan head screws
3	DX External Interface Board PCBA
4	Cable connecting the external interface board and battery connect board FPC

23. Disassembling and replacing the internal wire to defibrillator DX socket (pad host)

Use a crosshead screwdriver to remove two M2.5X12 cross recessed pan head screws that secure the internal wire to defibrillator DX socket, and then remove the cable from the rear shell.

Figure6–36

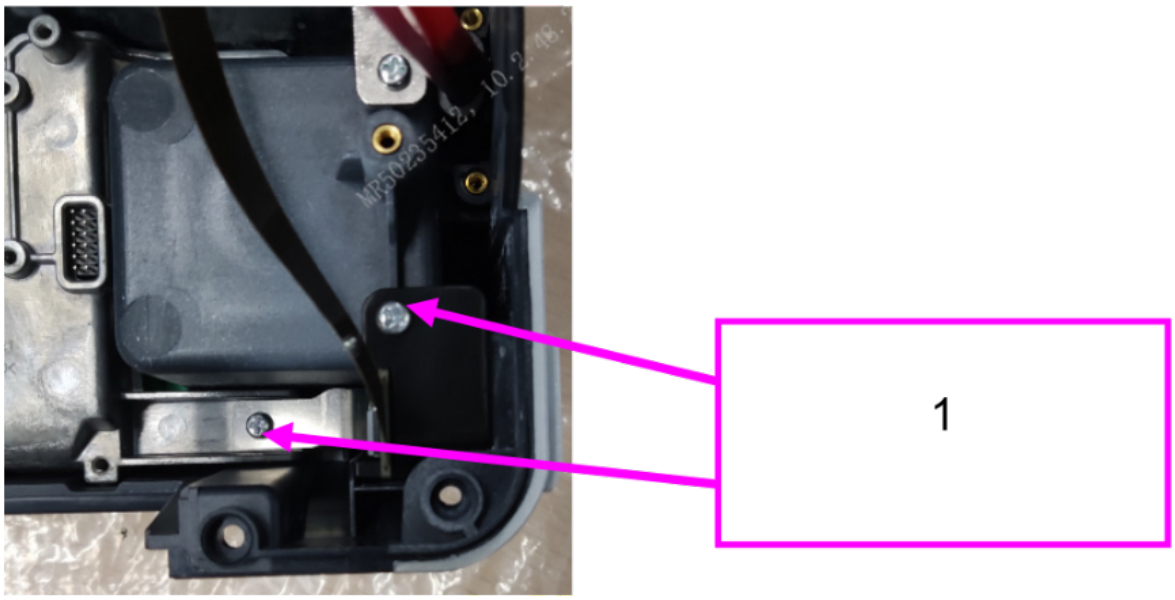


1 Two M2.5X12 cross recessed pan head screws

24. Disassembling and replacing Type−C interface board assembly (pad host and ultrasound function configured)

1) Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the Type-C interface board assembly, and then remove the assembly from the rear shell.

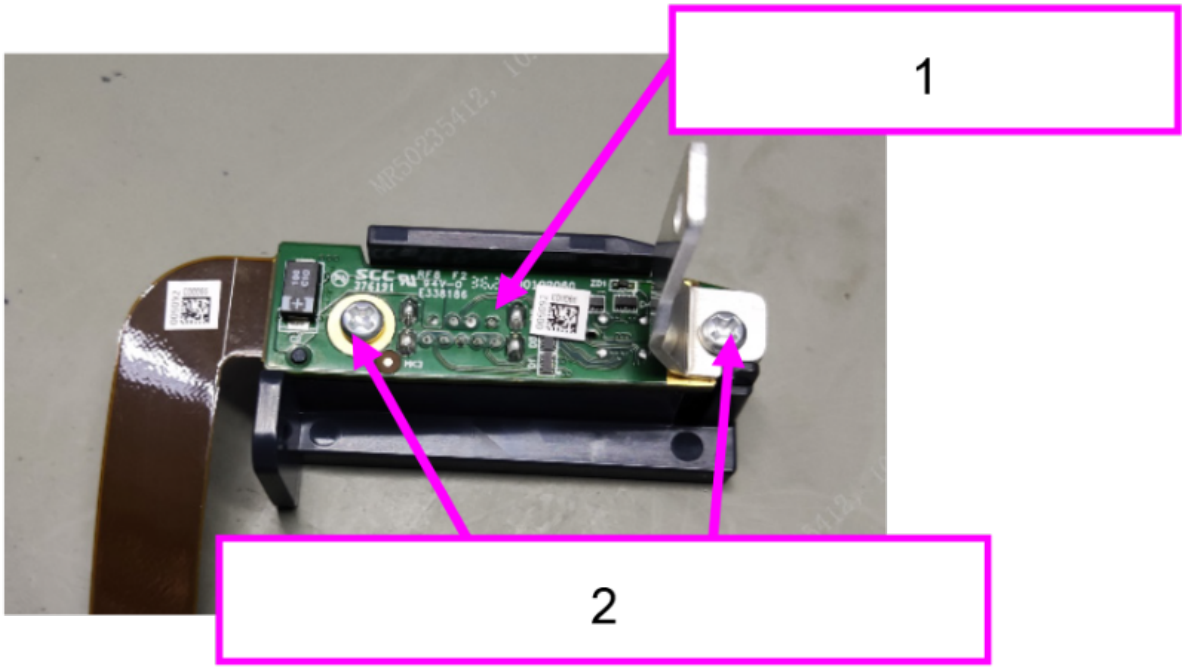
Figure6–37



1 Two M3X6 cross recessed pan head screws

2) Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the Type-C interface board, and then remove the board from the rear shell.

Figure6–38



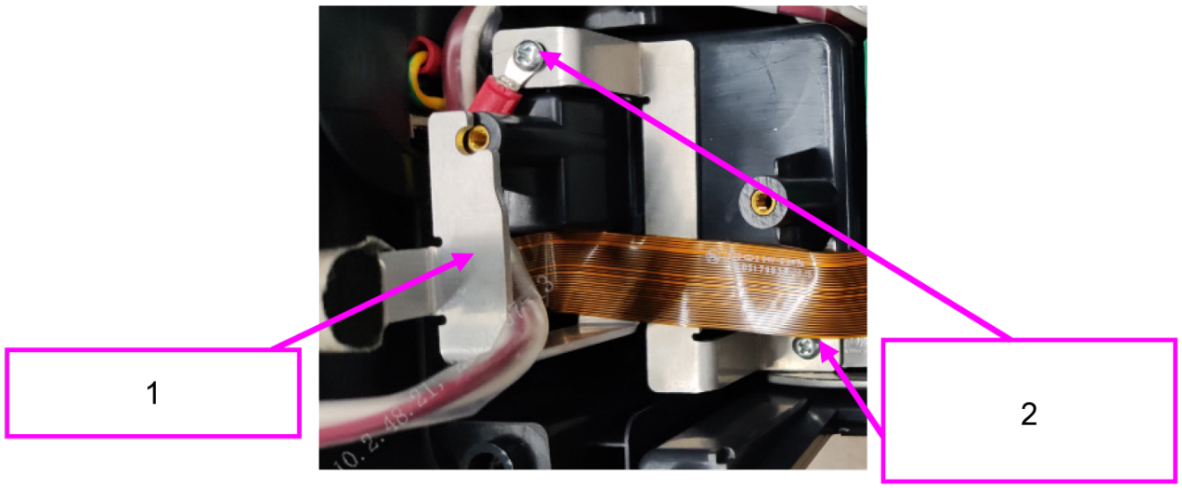
1 Type-C interface board

2 Two M3X6 cross recessed pan head screws

25. Disassembling and replacing the left electrode base assembly, DX external interface board, cable connecting the external interface board and battery connect board FPC and D60 Type-C interface board grounding cable (paddle host)

1) Use a crosshead screwdriver to remove two PT3X8 crosshead pan head self-tapping screws that secure the I/O interface assembly, and then remove the I/O interface sheet metal.

Figure6–39

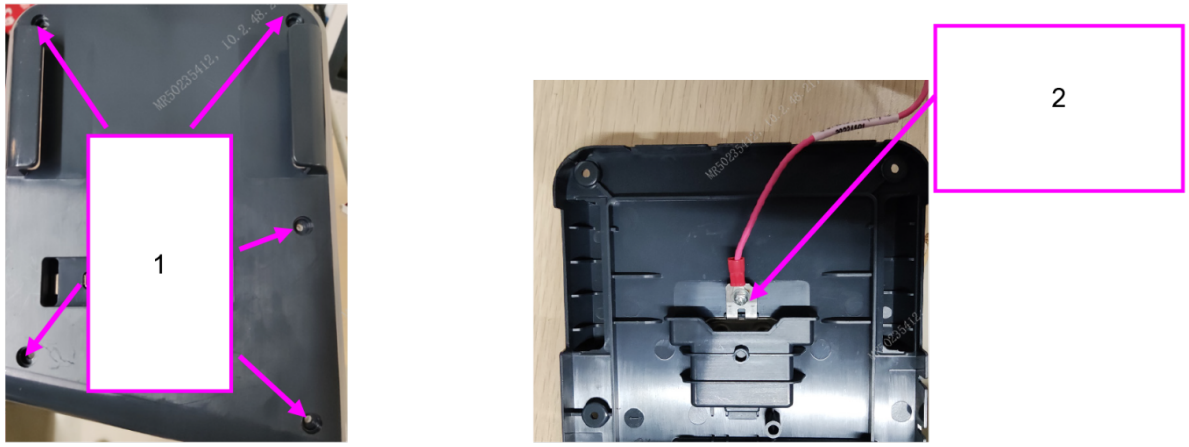


1 I/O interface sheet metal

2 Two PT3X8 cross recessed pan head self-tapping screws

2) Use tweezers to remove the rubber stoppers of the screws. Use a crosshead screwdriver to remove the five PT3X8 crosshead pan head self-tapping screws that secure the left electrode base, and remove the left electrode base assembly from the rear shell of the main unit of the paddle. Use a crosshead screwdriver to remove one M3X6 cross pan head combination screw that secures the in-position detection cable, and separate the left electrode base from the rear shell.

Figure6–40

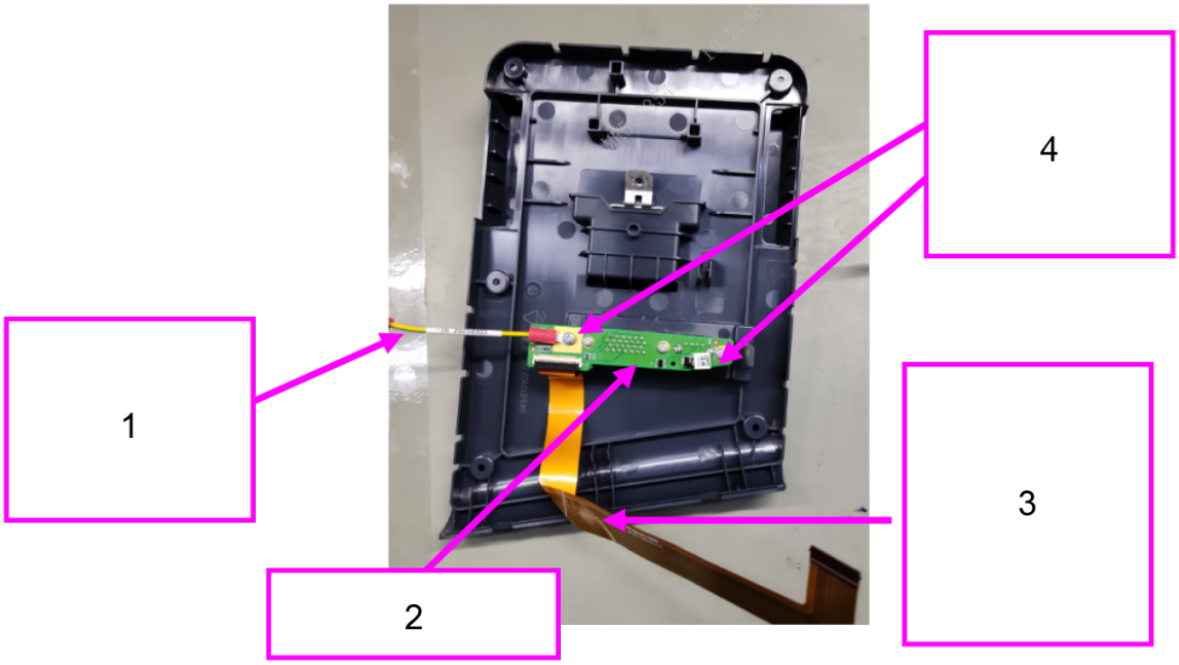


1 Five PT3X8 cross recessed pan head self-tapping screws

2 One M3X6 crosshead pan head combination screw

3) Use a crosshead screwdriver to remove two PT3X8 cross recessed pan head screws that secure the Type-C interface board assembly and the external interface board.

Figure6–41

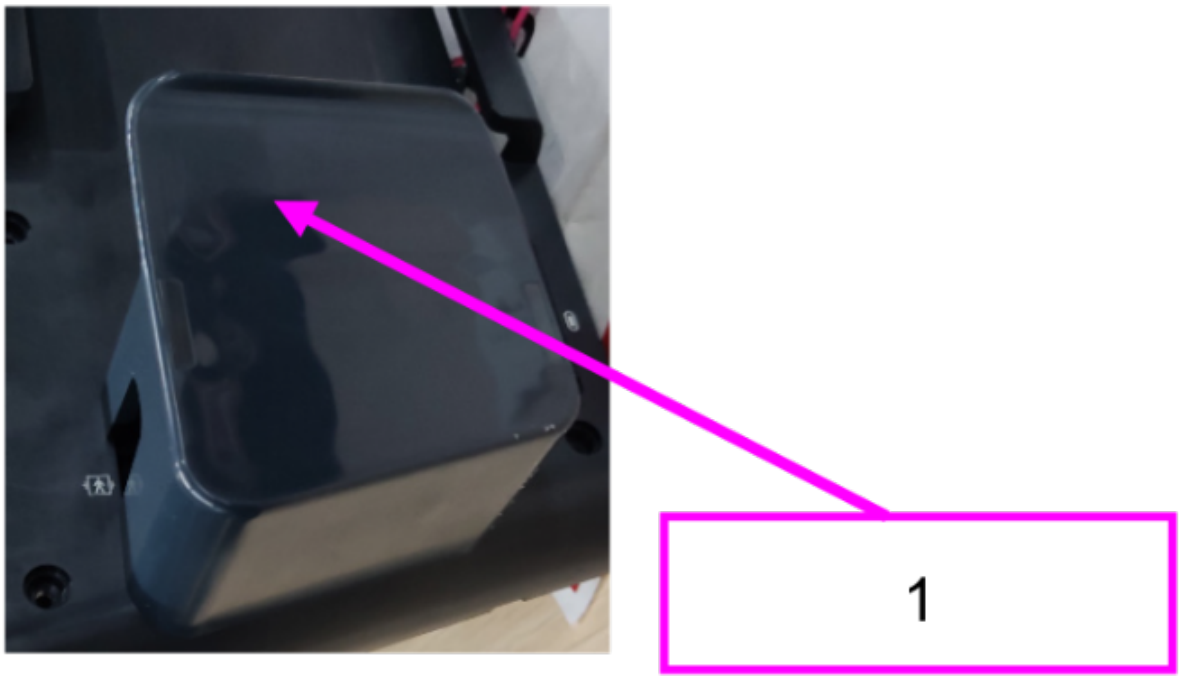


1	Grounding Cable of Type-C Interface Board
2	External Interface Board
3	Cable connecting the external interface board and battery connect board FPC
4	Two PT3X8 cross recessed pan head self-tapping screws

26. Disassembling and replacing the DX defibrillator interface cover (0659), right electrode base assembly, internal wire to defibrillator DX socket, pin of defibrillator (0658) and Type−C interface board assembly (pad host)

1) Remove the DX defibrillator interface cover from the right electrode base assembly.

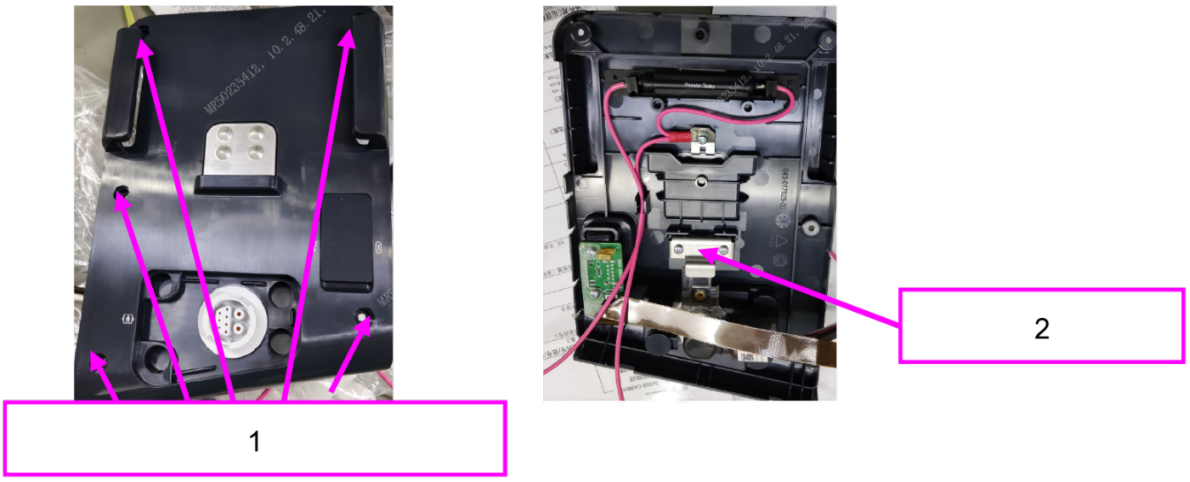
Figure6–42



1 Defibrillator Interface Cover

2) Use tweezers to take out the rubber stopper on the right electrode base. Use a crosshead screwdriver to remove the five PT3X8 cross recessed pan head self-tapping screws that secure the right electrode base, and separate the right electrode base assembly from the rear shell.

Figure6–43

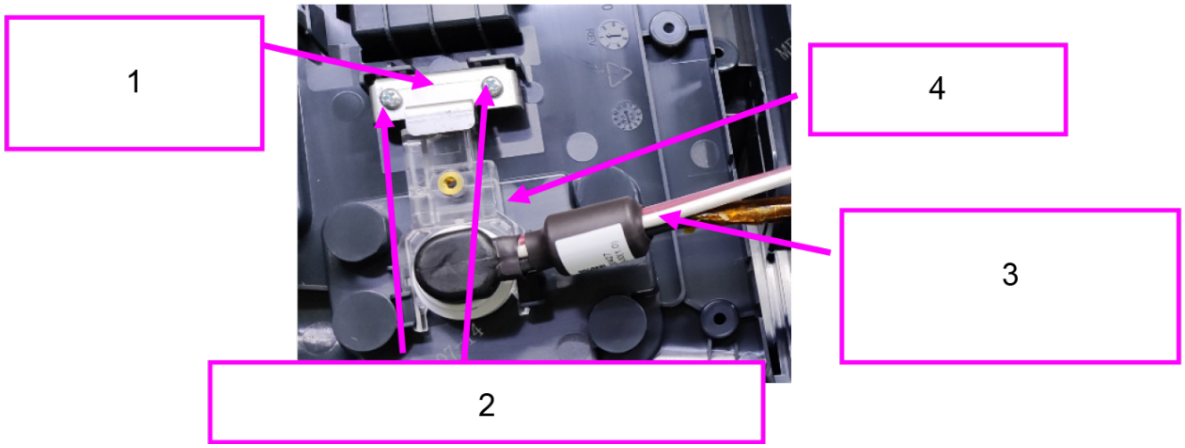


1 Five PT3X8 cross recessed pan head self-tapping screws

2 Right Electrode Base Assembly

3) Use a crosshead screwdriver to remove the two PT3X8 cross recessed pan head self-tapping screws that secure the fixed sheet metal of DX defibrillation interface, remove the pin of defibrillator, and remove the internal wire to defibrillator DX socket.

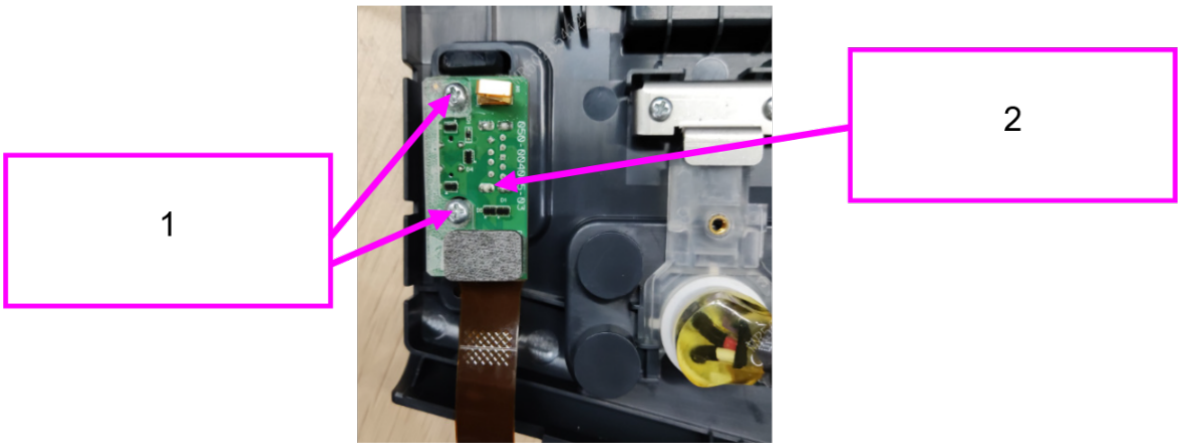
Figure6–44



1	Fixed sheet metal of DX defibrillation interface
2	Two PT3X8 cross recessed pan head self-tapping screws
3	Internal Wire to Defibrillator DX Socket
4	Pin of Defibrillator

4) Use a crosshead screwdriver to remove two PT3X8 cross recessed pan head self-tapping screws that secure the Type-C interface board, and then remove the board. (Ultrasound function or camera configured)

Figure6–45

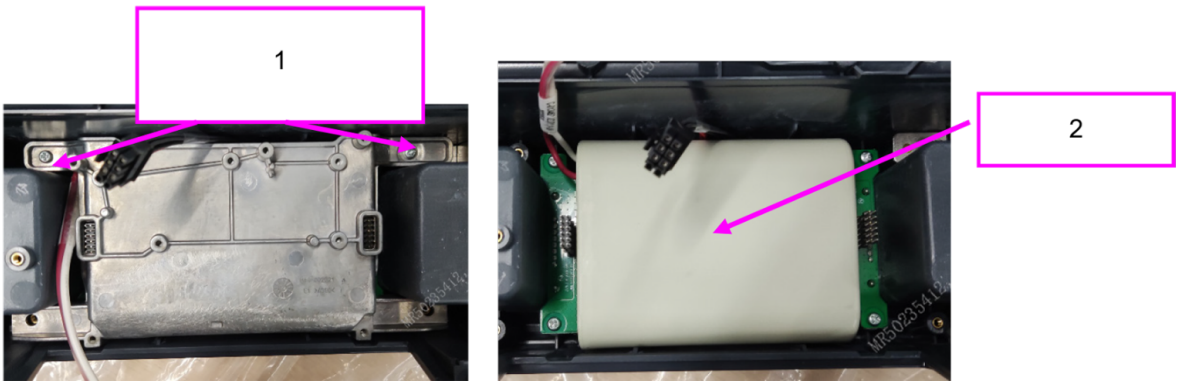


1	Two PT3X8 cross recessed pan head self-tapping screws
2	Type-C interface board assembly

27. Disassembling and replacing large capacitor cable, battery backplate, and magnetic attraction input wire

1) Use a crosshead screwdriver to remove the two M3X6 cross recessed pan head screws that secure the capacitor bracket (0659) (if the equipment is configured with paddles, remove the two PT3X8 cross recessed pan head self-tapping screws), and remove the capacitor bracket from the rear shell. Then, take out the capacitor.

Figure6–46

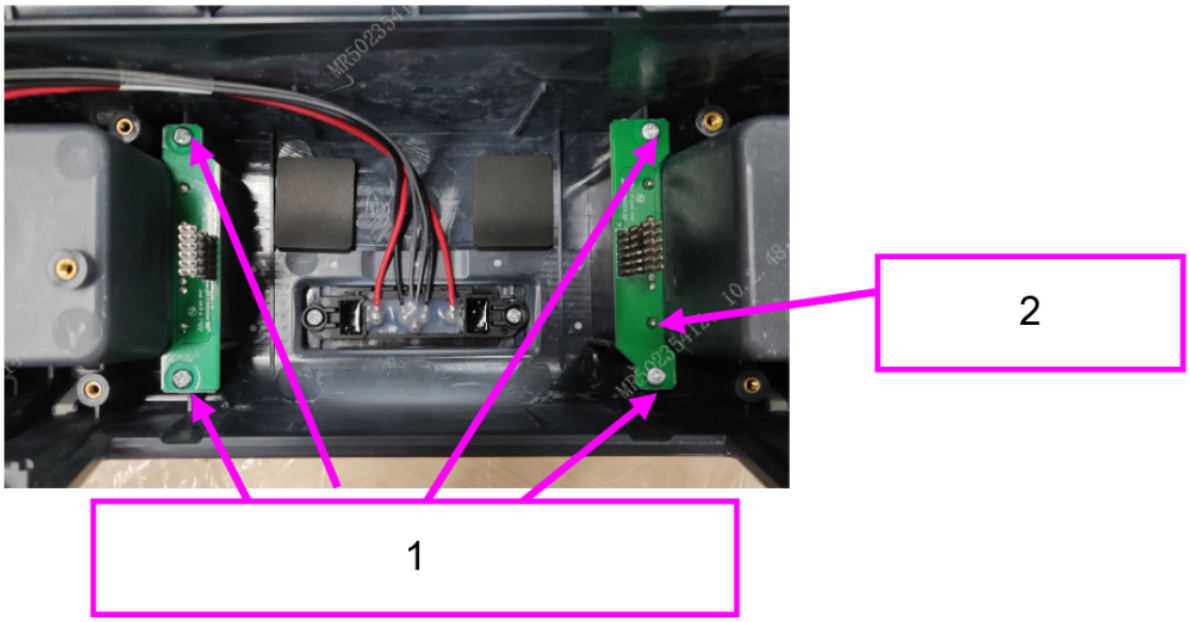


1 Two M3X6 cross recessed pan head screws

2 Large Capacitor Cable

2) Use a crosshead screwdriver to remove the four M3X6 cross recessed pan head screws that secure the left and right battery backplates (if the equipment is configured with paddles, remove the four PT3X8 cross recessed pan head self-tapping screws), and remove the battery backplates from the rear shell.

Figure6–47

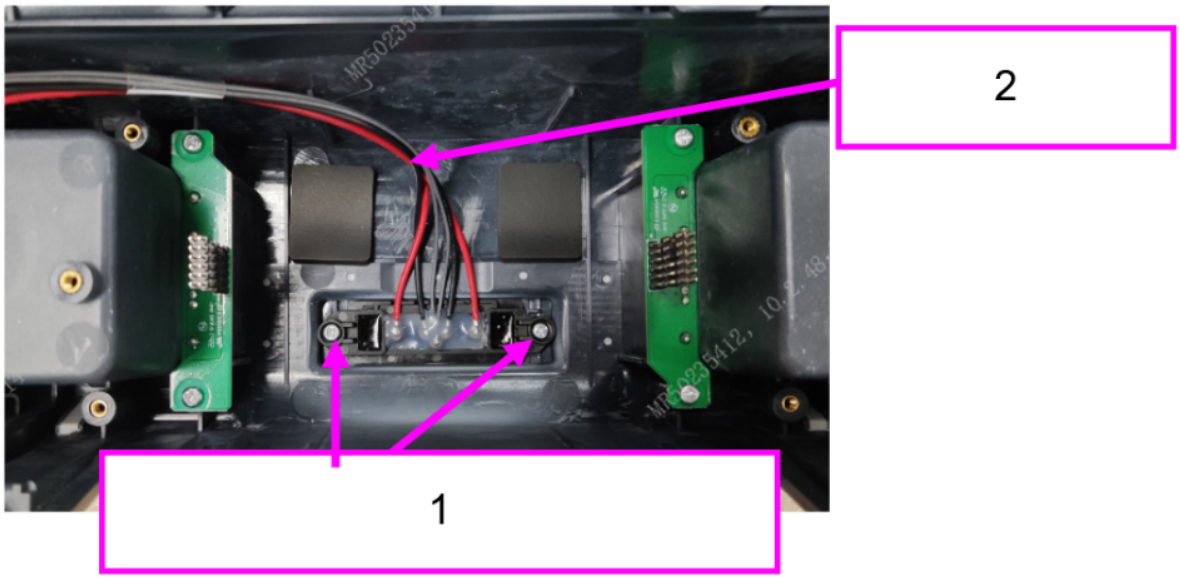


1 Four M3X6 cross recessed pan head screws

2 Battery Backplate

3) Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the magnetic attraction input wire, and then remove the cable from the rear shell (paddle host).

Figure6–48



1 Two M3X6 cross recessed pan head screws

2 Magnetic attraction input wire

28. Disassembling and replacing DX self-check resistor connector (paddle host)

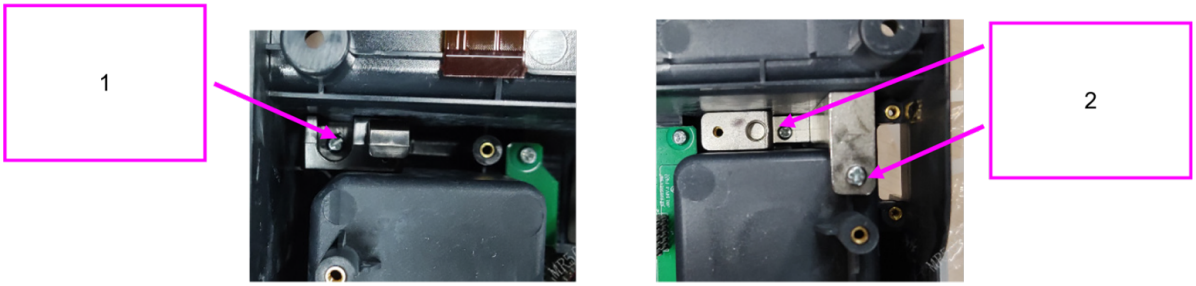
1) Use tweezers to remove the rubber stoppers of the N1 transfer box grounding block on the rear shell. Use a crosshead screwdriver to remove the four M3X12 cross recessed pan head screws with washers that secure the right electrode base of N1 transfer box grounding block. Remove the N1 transfer box grounding block from the rear shell.

Figure6–49

1 Four M3X12 cross recessed pan head screws with washers

2) Use a crosshead screwdriver to remove three PT3X8 cross recessed pan head self-tapping screws that secure the positioning block of the DX rear shell and the paddle socket connection bracket. Remove the positioning block of the DX rear shell and the paddle socket connection bracket. Pull out the in-position detection cable from the rear shell.

Figure6–50

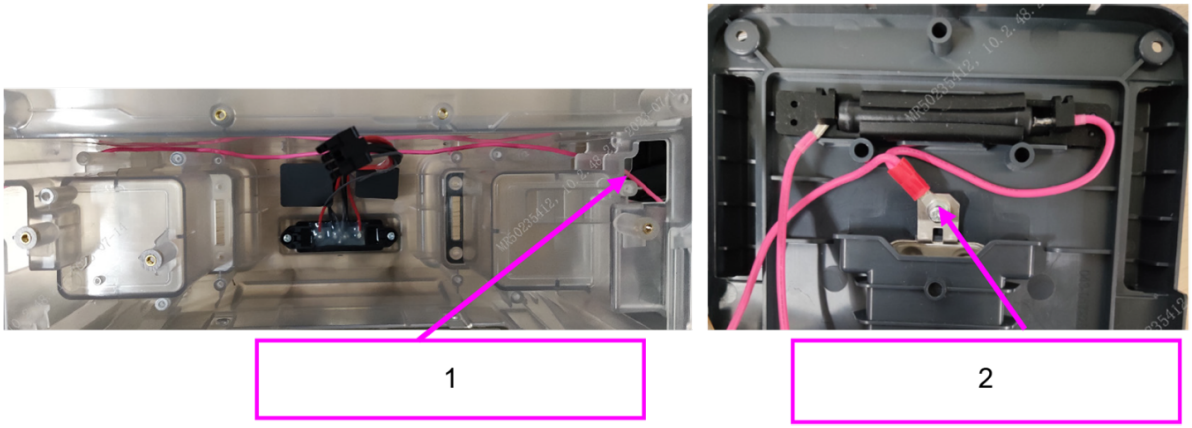


1 One PT3X8 cross recessed pan head self-tapping screw

2 Two PT3X8 cross recessed pan head self-tapping screws

3) Pull out the in-position detection cable from the rear shell. Use a crosshead screwdriver to remove one M3X6 cross recessed pan head combination screw that secures the in-position detection cable, and then replace the cable.

Figure6–51



1 Pulling out the cable from the right side of the rear shell

2 One M3X6 cross recessed pan head combination screw

6.5 Keypad Backup Connector

6.5.1 General Information

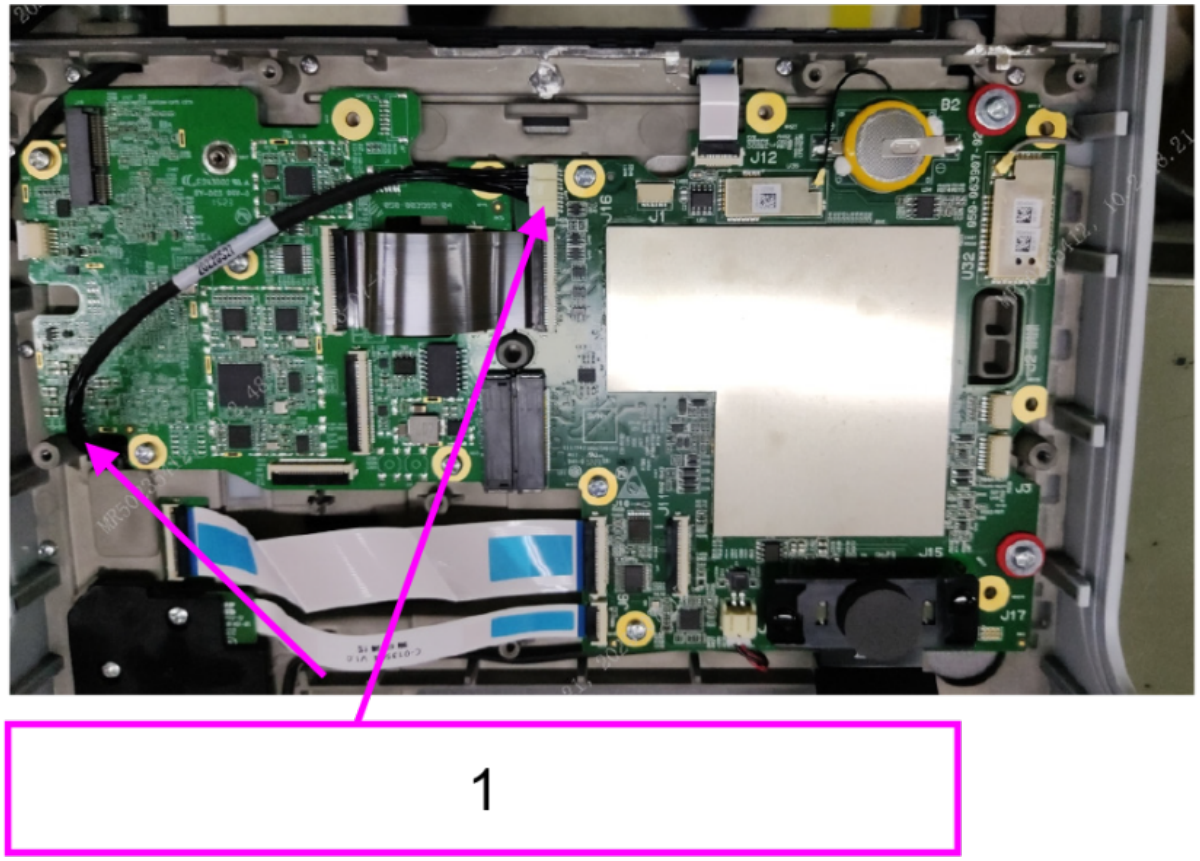
Figure6–52

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-012790-00	Keypad Backup Connector	None	None

6.5.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:
   Unplug the keypad backup connectors from the keypad and main control board socket, take out the cable and replace it.

Figure6–53



1 Unplug the keypad backup connectors from the two boards

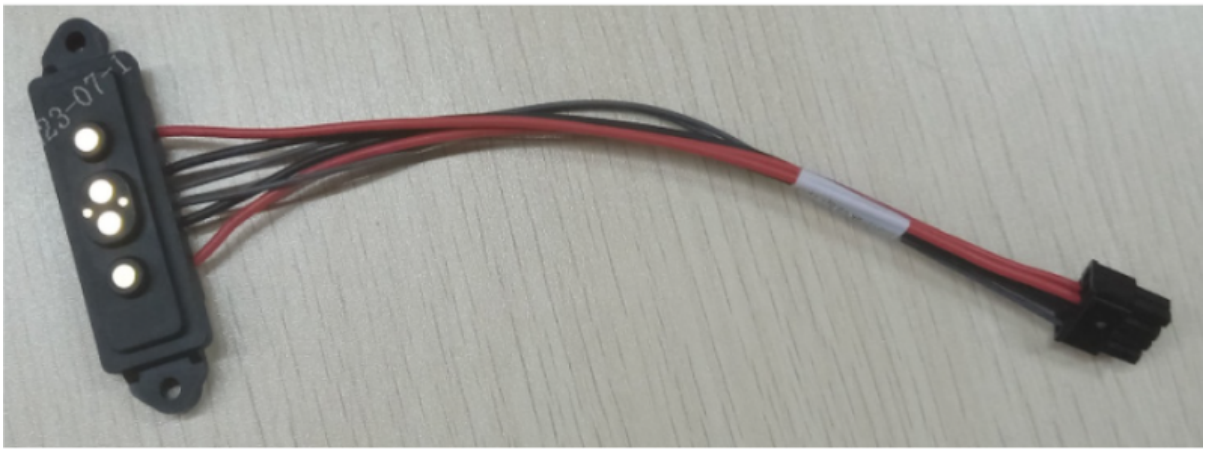
6.5.3 Commissioning and Verification

None

6.6 D60 Magnetic Attraction Input Wire

6.6.1 General Information

Figure6–54

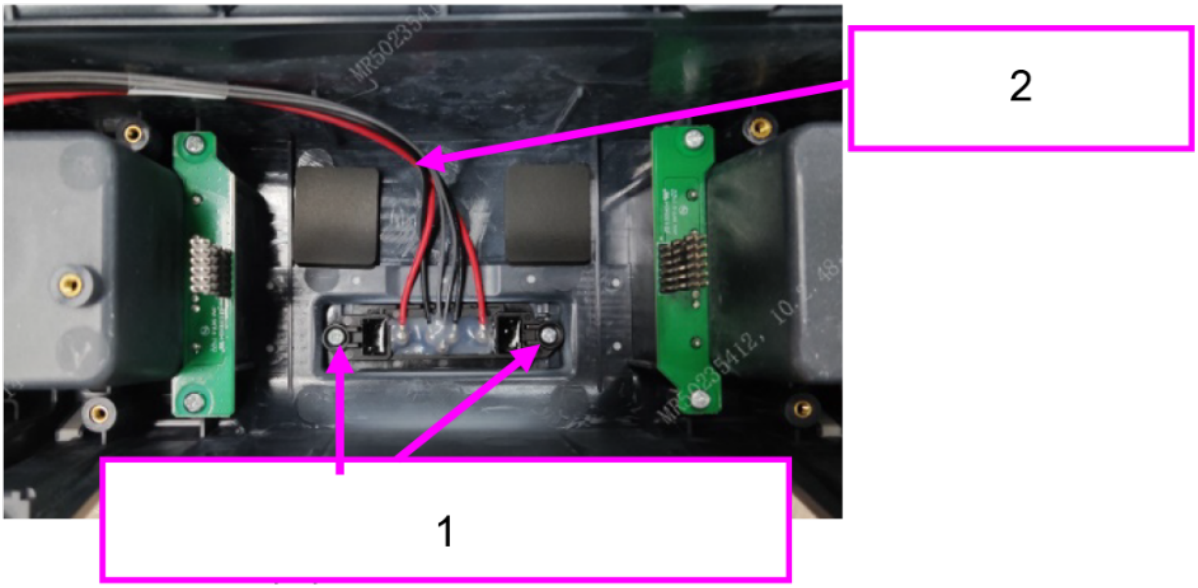


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-012795-00	D60 Magnetic Attraction Input Wire	None	None

6.6.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0656 Large Capacitance Cable, see 0656 Large Capacitance Cable **6.11.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the magnetic attraction input wire, and then remove the cable from the rear shell (paddle host).

Figure6–55



1	Two M3X6 cross recessed pan head screws
2	Magnetic attraction input wire

6.6.3 Commissioning and Verification

None

6.7 Cable for D60 DX Recorder

6.7.1 General Information

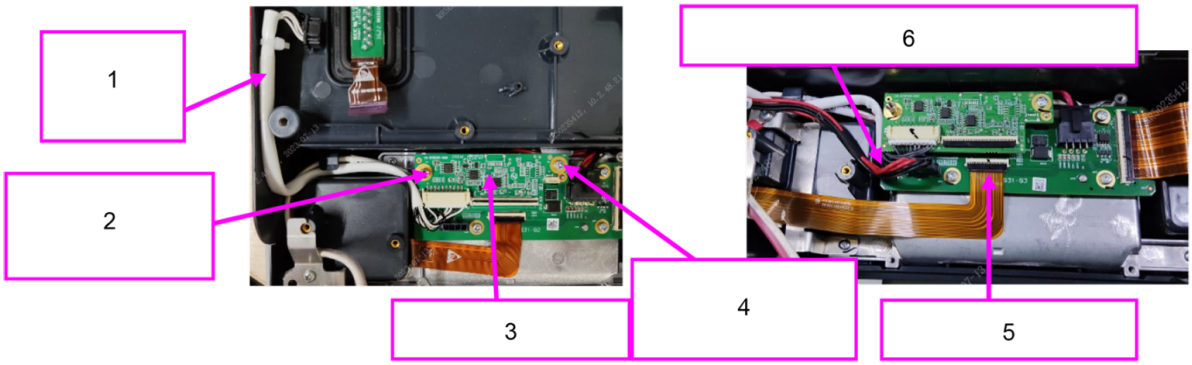
Figure6–56

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-012800-00	Cable for D60 DX Recorder	None	None

6.7.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove one M3X6 cross recessed pan head screw that fixes the recorder drive board. Use needle-nose pliers to remove one M3X6 stud screw that fixes the recorder drive board. Remove the recorder drive board and recorder cable.

Figure6–57



1	Recorder Cable
2	One M3X6 stud screw
3	Recorder drive board
4	One M3X6 cross recessed pan head screw
5	External interface FPC board
6	DC Input Cable of Defibrillator DX Power Parameter Board

6.7.3 Commissioning and Verification

None

6.8 DX Network Cable

6.8.1 General Information

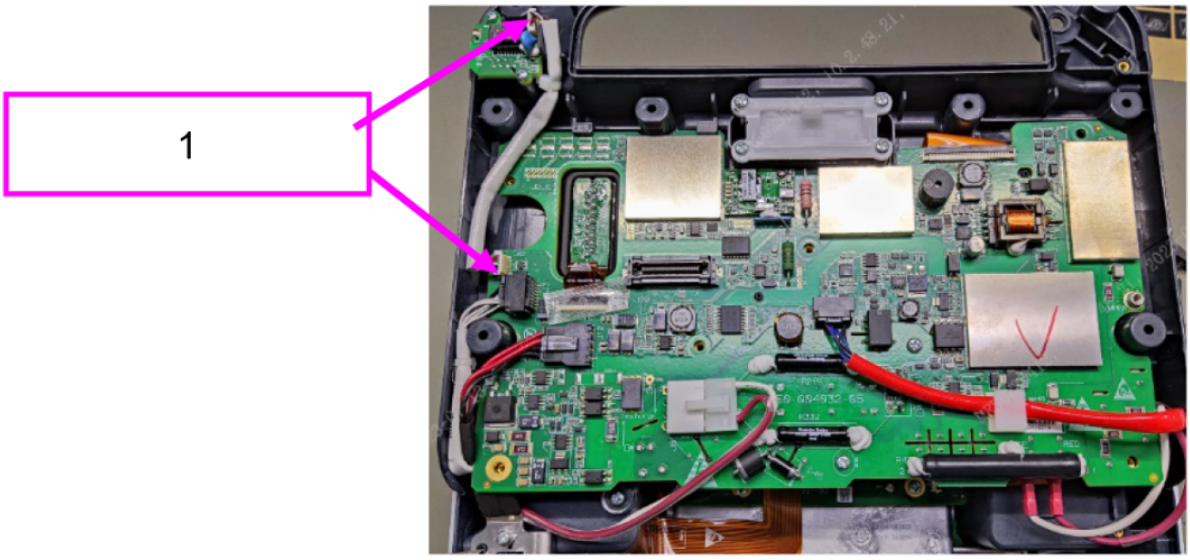
Figure6–58

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013013-00	DX Network Cable	None	None

6.8.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of DX Integrated Therapy Board Insulation Sheet Assembly FRU, see DX Integrated Therapy Board Insulation Sheet Assembly FRU **6.62.2** Disassembly and Assembly.
4. Specific steps:
   Unplug the cable from the socket on the board and replace it.

Figure6–59



1 Network Interface Cable

6.8.3 Commissioning and Verification

None

6.9 DC Input Cable of Defibrillator DX Power Parameter Board

6.9.1 General Information

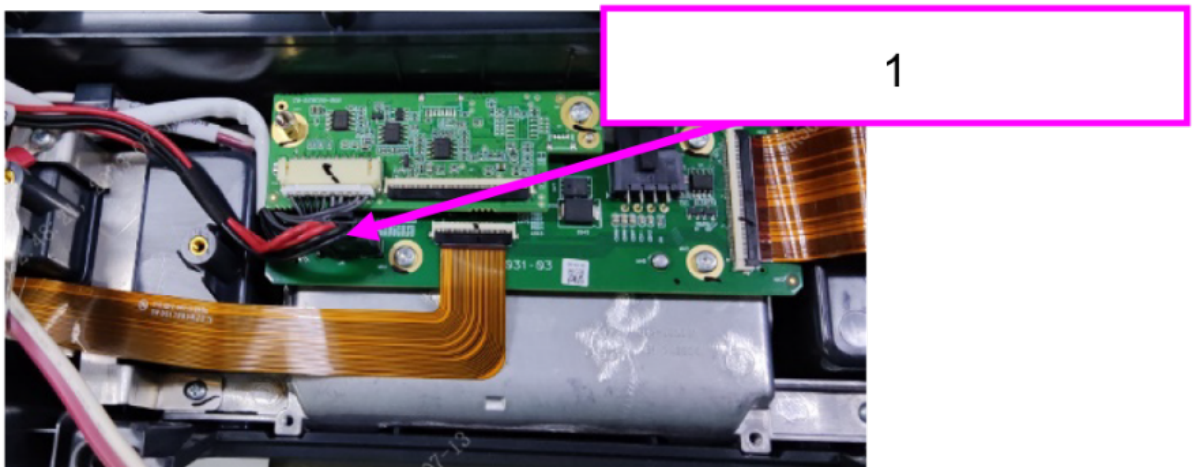
Figure6–60

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013052-00	DC Input Cable of Defibrillator DX Power Parameter Board	None	None

6.9.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Remove the DC input cable of defibrillator DX power parameter board.

Figure6–61



1 DC Input Cable of Defibrillator DX Power Parameter Board

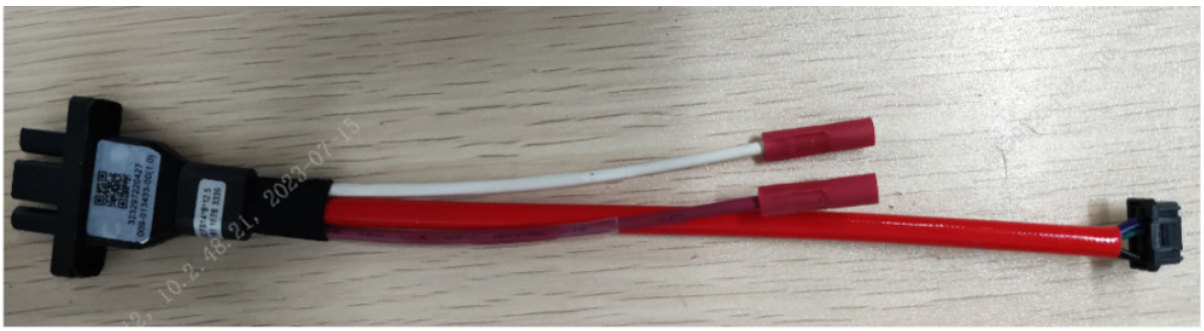
6.9.3 Commissioning and Verification

None

6.10 Internal Wire to Defibrillator DX Socket

6.10.1 General Information

Figure6–62

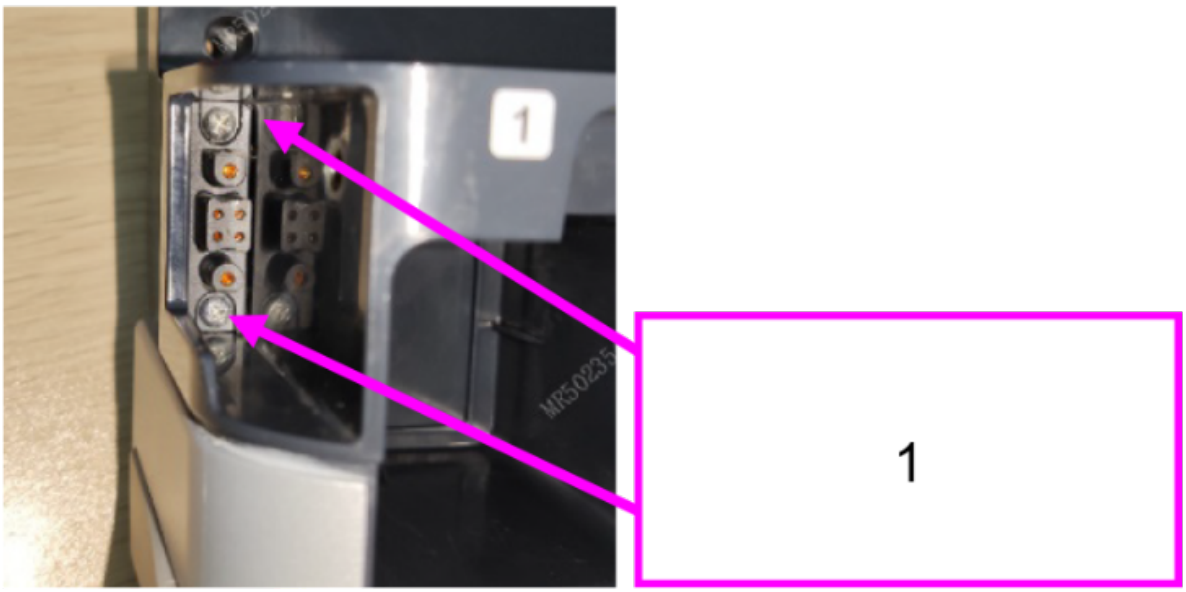


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013433-00	Internal Wire to Defibrillator DX Socket	None	None

6.10.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration), see Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) **6.62.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two M2.5X12 cross recessed pan head screws that secure the internal wire to defibrillator DX socket, and then remove the cable from the rear shell.

Figure6–63



1 Two M2.5X12 cross recessed pan head screws

6.10.3 Commissioning and Verification

None

6.11 0656 Large Capacitance

6.11.1 General Information

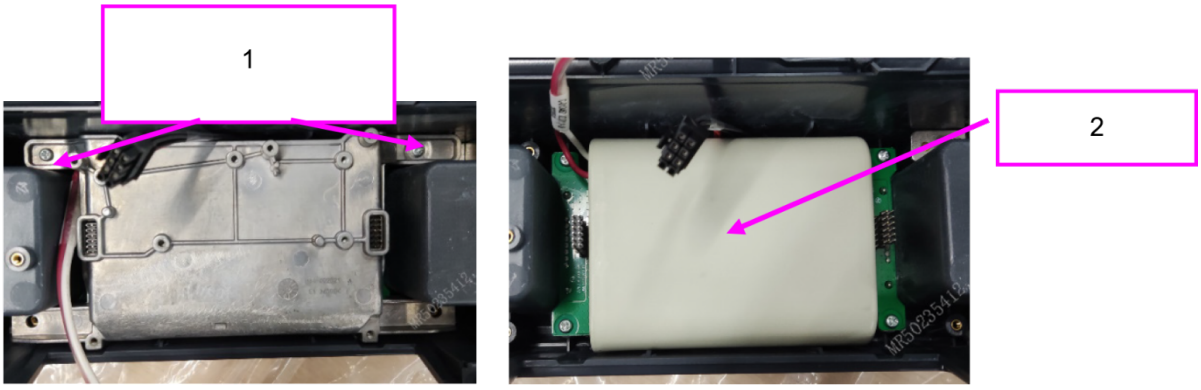
Figure6–64

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013462-00	0656 Large Capacitance	None	None

6.11.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 DX Power Adapter Board, see the 0659 DX Power Adapter Board **6.45.2** Disassembly and Assembly.
4. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.
5. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
6. Specific steps:
   Use a crosshead screwdriver to remove the two M3X6 cross recessed pan head screws that secure the capacitor bracket (0659) (if the equipment is configured with paddles, remove the two PT3X8 cross recessed pan head self-tapping screws), and remove the capacitor bracket from the rear shell. Then, take out the capacitor.

Figure6–65



1 Two M3X6 cross recessed pan head screws

2 Large Capacitor Cable

6.11.3 Commissioning and Verification

None

6.12 Wire FFC 12pin Pitch 0.5mm (Same Side Connection)

6.12.1 General Information

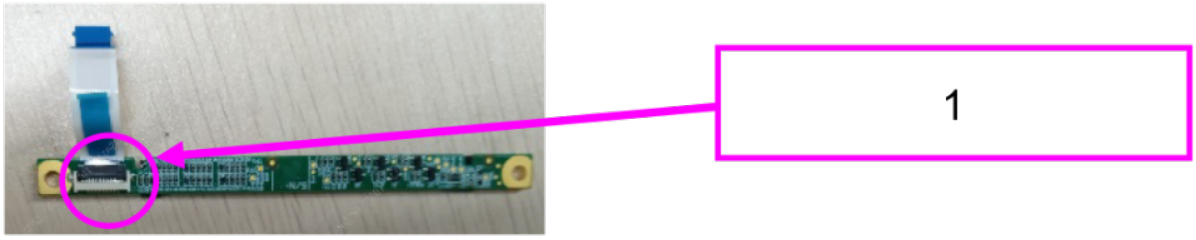
Figure6–66

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013582-00	Wire FFC 12pin Pitch 0.5mm (Same Side Connection)	None	None

6.12.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0656 D60 Alarm PCBA, see 0656 D60 Alarm PCBA **6.40.2** Disassembly and Assembly.
4. Specific steps:
   Remove the alarm LED FFC cable and replace it.

Figure6–67



1 Disassemble the alarm LED FFC cable.

6.12.3 Commissioning and Verification

None

6.13 Wire FFC 12pin Pitch 0.5mm (Different Side Connection)

6.13.1 General Information

Figure6–68

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013584-00	Wire FFC 12pin Pitch 0.5mm (Different Side Connection)	None	None

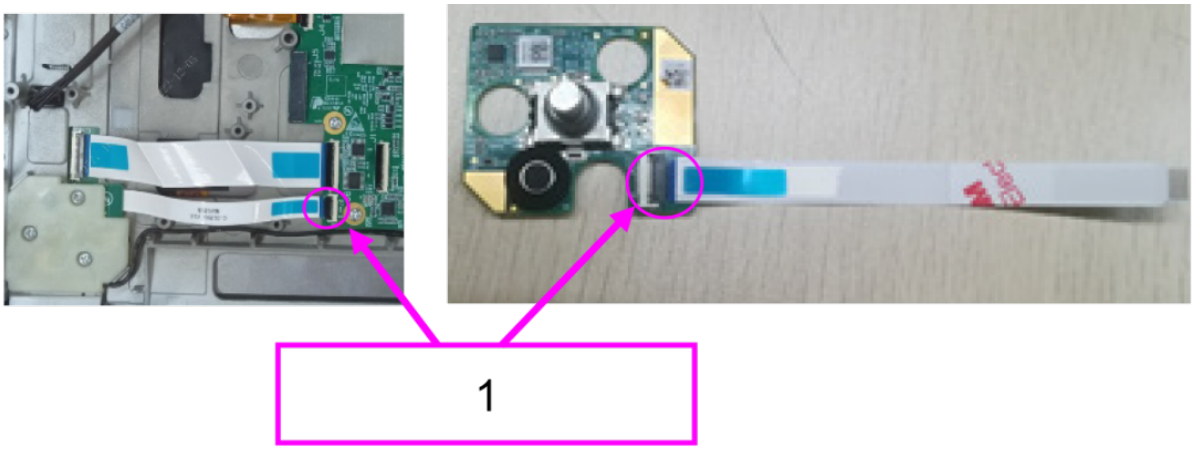
6.13.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. If 4G/5G/Wi-Fi function is configured, follow the procedure below:
   For the disassembly of the 4G/5G/Wi-Fi Board Assy, see the 4G **6.56.2** Disassembly and Assembly/5G **6.57.2** Disassembly and Assembly/Wi-Fi Board Assy **6.55.2** Disassembly and Assembly.
4. For the disassembly of Rotary Encoder (0658) and 0656 D60 Coder PCBA, see Rotary Encoder (0658) **6.22.2** Disassembly and Assembly and 0656 D60 Coder PCBA **6.41.2** Disassembly and Assembly.
5. Specific steps:

1) Open the FFC clips of the encoder on the main control board and encoder, remove the FFC cable, and replace it.

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

Figure6–69



1 Disassemble the encoder FFC cable.

6.13.3 Commissioning and Verification

None

6.14 Wire FFC 12pin Pitch 0.5mm (Different Side Connection)

6.14.1 General Information

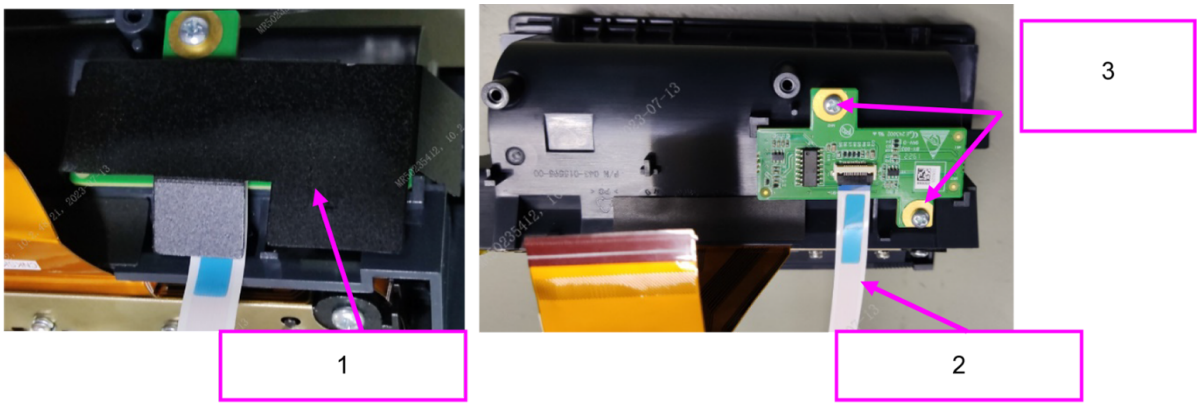
Figure6–70

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013585-00	Wire FFC 12pin Pitch 0.5mm (Different Side Connection)	None	None

6.14.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Remove the SIM insulation sheet, and use a crosshead screwdriver to remove the two PT3X8 crosshead self-tapping screws on the SIM board. Remove the SIM board and connection cable from the SIM board to the wireless module FFC.

Figure6–71



1	SIM Insulation Sheet
2	SIM Board Connection Cable
3	Two PT3X8 self-tapping screws

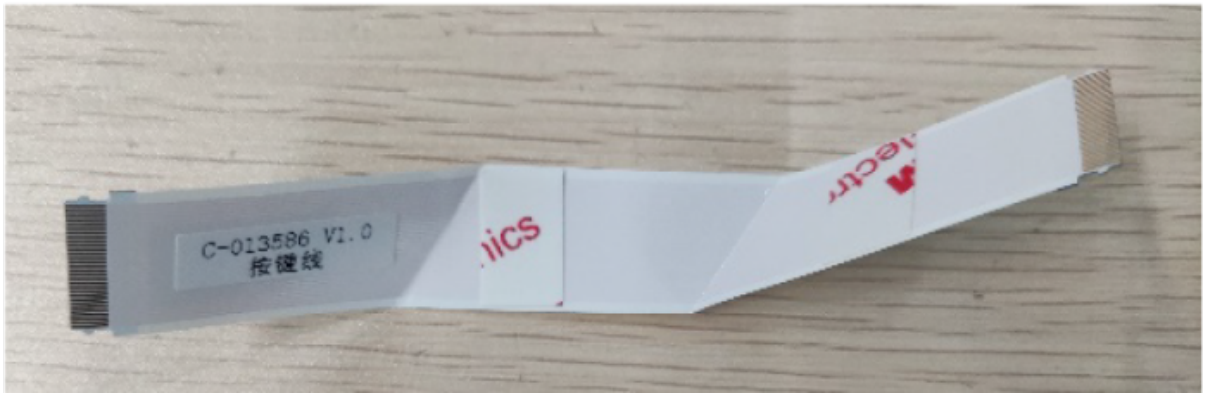
6.14.3 Commissioning and Verification

None

6.15 Wire FFC 30pin Pitch 0.5mm (Same Side Connection)

6.15.1 General Information

Figure6–72



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013586-00	Wire FFC 30pin Pitch 0.5mm (Same Side Connection)	None	None

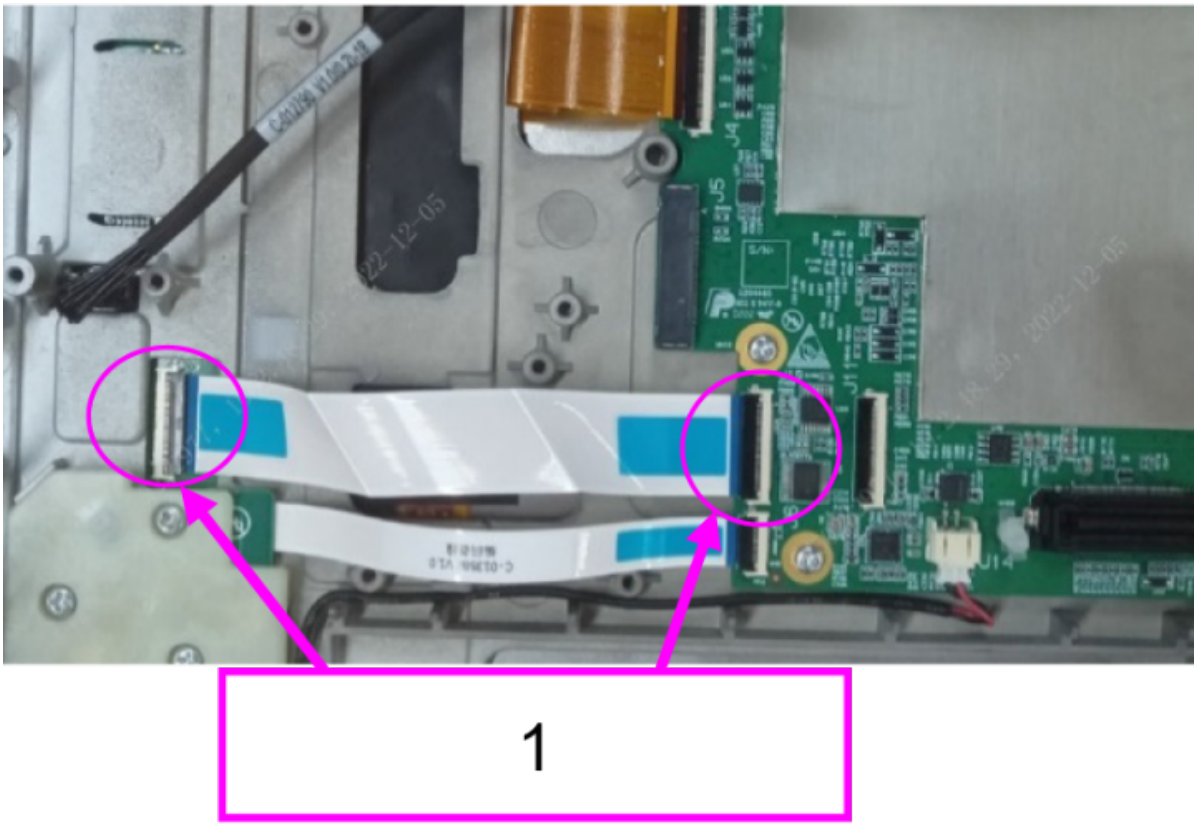
6.15.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. If 4G/5G/Wi-Fi function is configured, follow the procedure below:
   For the disassembly of the 4G/5G/Wi-Fi Board Assy, see the 4G **6.56.2** Disassembly and Assembly/5G **6.57.2** Disassembly and Assembly/Wi-Fi Board Assy **6.55.2** Disassembly and Assembly.
4. Specific steps:

1) Open the FFC clips of the keypad on the main control board and keypad, remove the FFC cable, and replace it.

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

Figure6–73



1 Disassemble the keypad FFC cable.

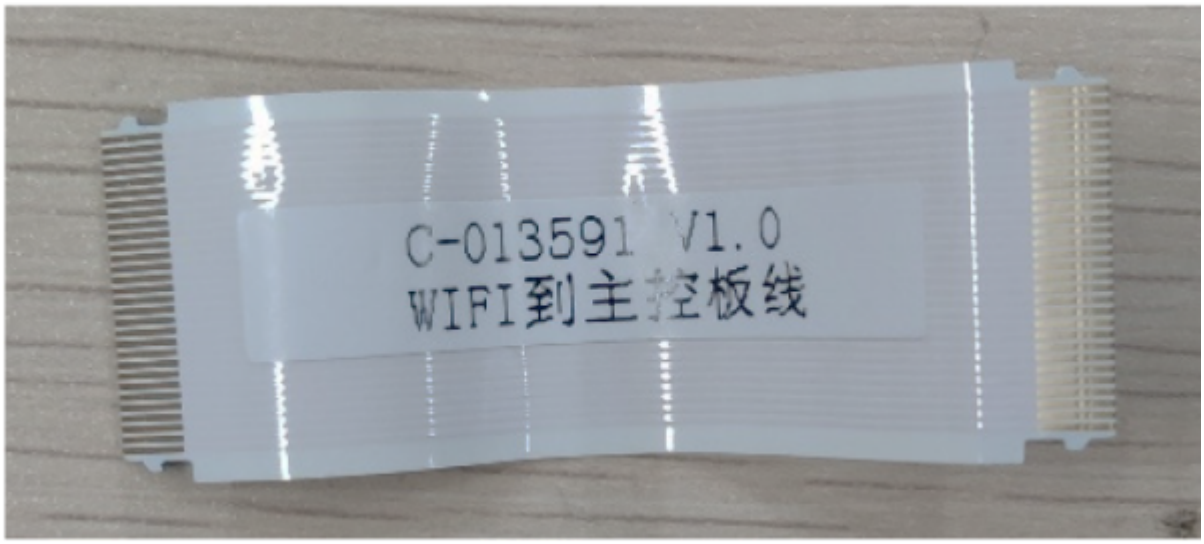
6.15.3 Commissioning and Verification

None

6.16 Wire FFC 30pin Pitch 0.5mm (Same Side Connection)

6.16.1 General Information

Figure6–74

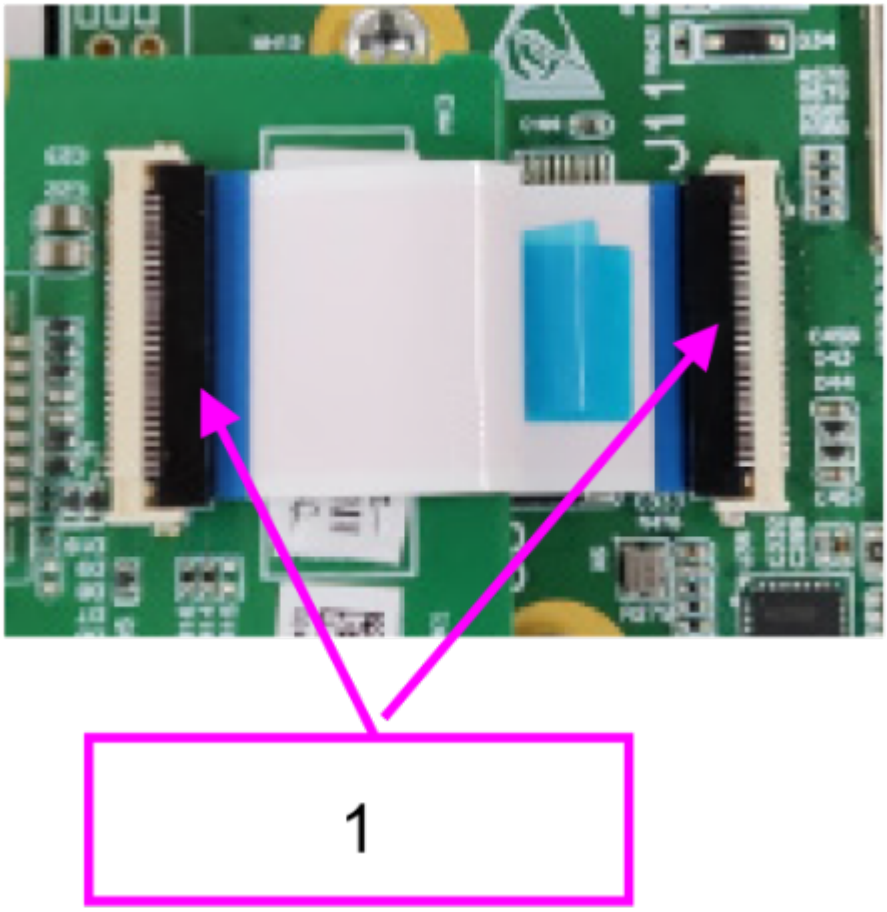


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-013591-00	Wire FFC 30pin Pitch 0.5mm (Same Side Connection)	None	None

6.16.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:
   Open the FFC clips on the Wi-Fi carrier board and main control board, take out the wire FFC 30pin pitch 0.5mm (same aide connection), and replace the wire.

Figure6–75



1 Open the FFC clip

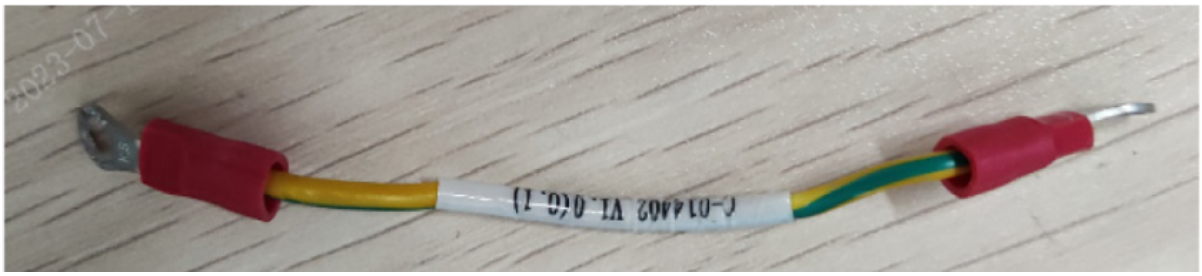
6.16.3 Commissioning and Verification

None

6.17 D60 Type-C Interface Board Grounding Cable

6.17.1 General Information

Figure6–76

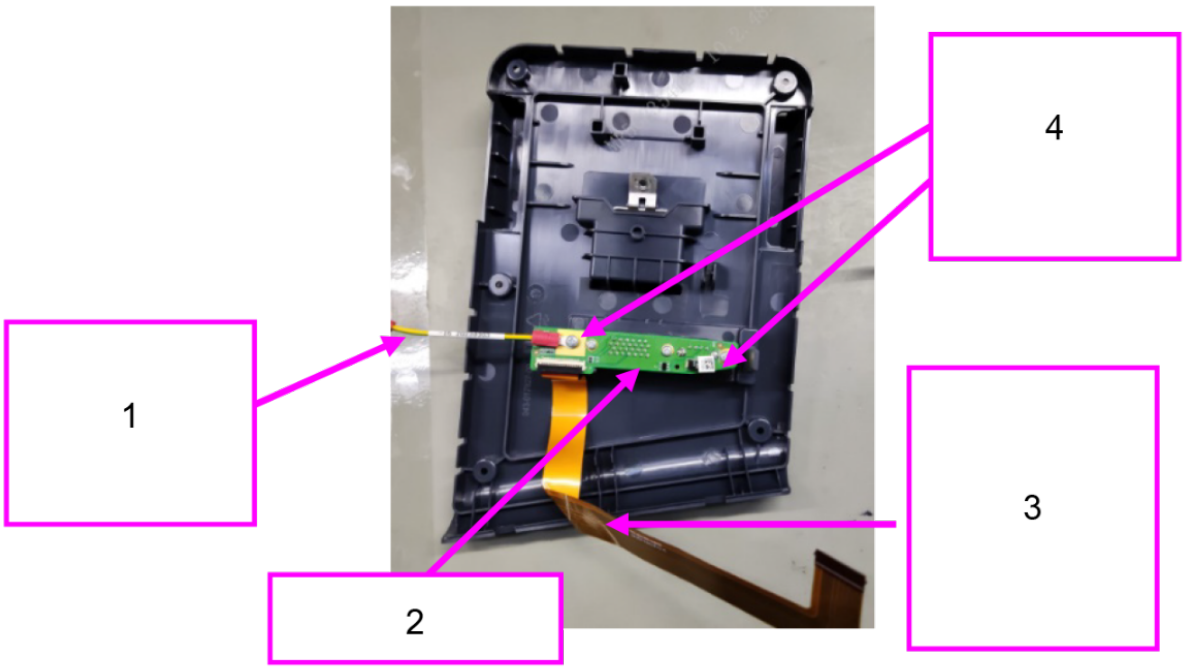


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-014402-00	D60 Type-C Interface Board Grounding Cable	None	None

6.17.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two PT3X8 cross recessed pan head screws that secure the Type-C interface board assembly and the external interface board. Remove the cable connecting the external interface board and battery connect board FPC.

Figure6–77



1	Grounding Cable of Type-C Interface Board
2	External Interface Board
3	Cable connecting the external interface board and battery connect board FPC
4	Two PT3X8 cross recessed pan head self-tapping screws

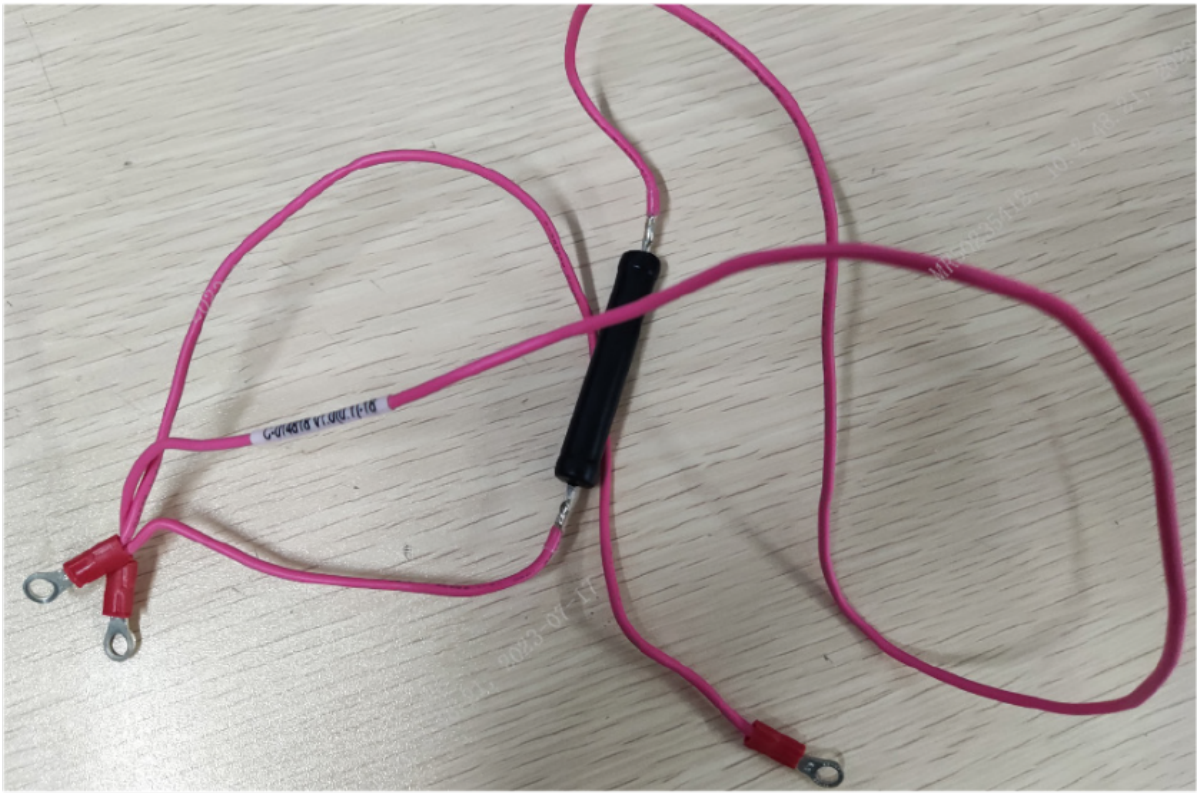
6.17.3 Commissioning and Verification

None

6.18 0656 DX Self-check Resistor Connector

6.18.1 General Information

Figure6–78

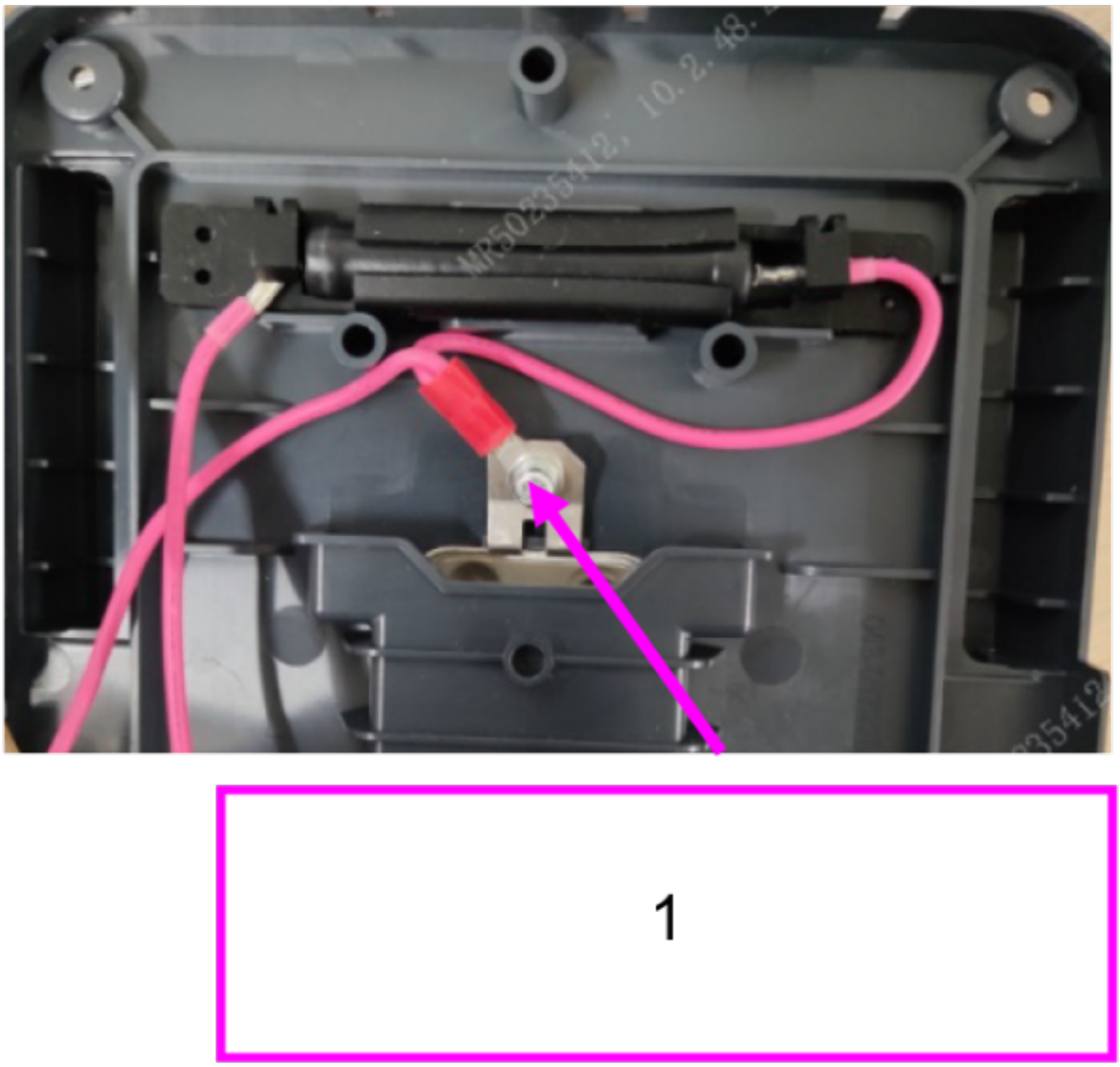


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-014818-00	0656 DX Self-check Resistor Connector	None	None

6.18.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove one M3X6 cross recessed pan head combination screw that secures the in-position detection cable, and then replace the cable.

Figure6–79



1 One M3X6 cross recessed pan head combination screw

6.18.3 Commissioning and Verification

None

6.19 Internal Wire to Defibrillator DX Socket

6.19.1 General Information

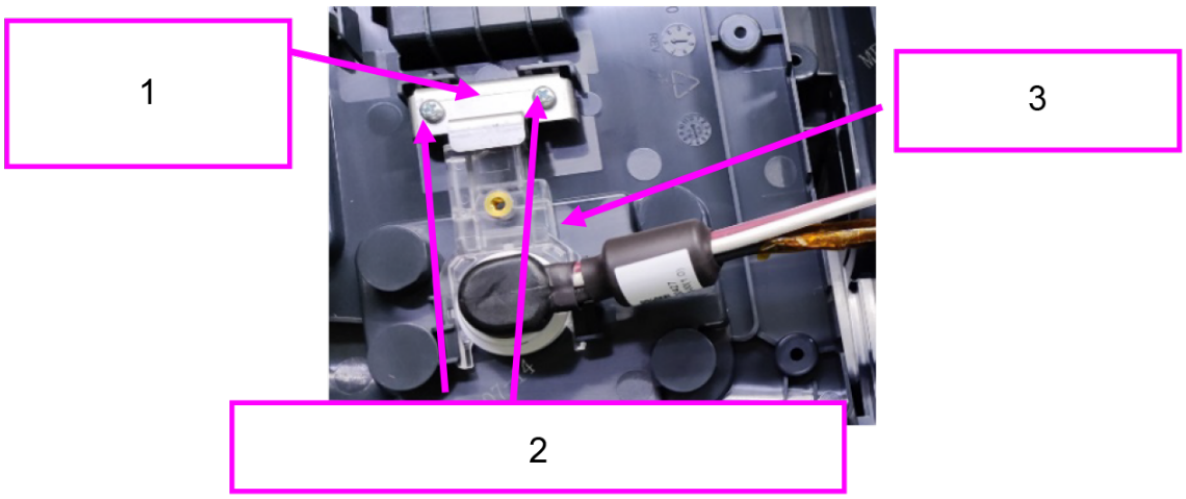
Figure6–80

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
009-014843-00	Internal Wire to Defibrillator DX Socket	None	None

6.19.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of Pin of Defibrillator (0658), see Pin of Defibrillator (0658) **6.21.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the two PT3X8 cross recessed pan head self-tapping screws that secure the fixed sheet metal of DX defibrillation interface, remove the pin of defibrillator, and remove the internal wire to defibrillator DX socket.

Figure6–81



1	Fixed sheet metal of DX defibrillation interface
2	Two PT3X8 cross recessed pan head self-tapping screws
3	Pin of Defibrillator

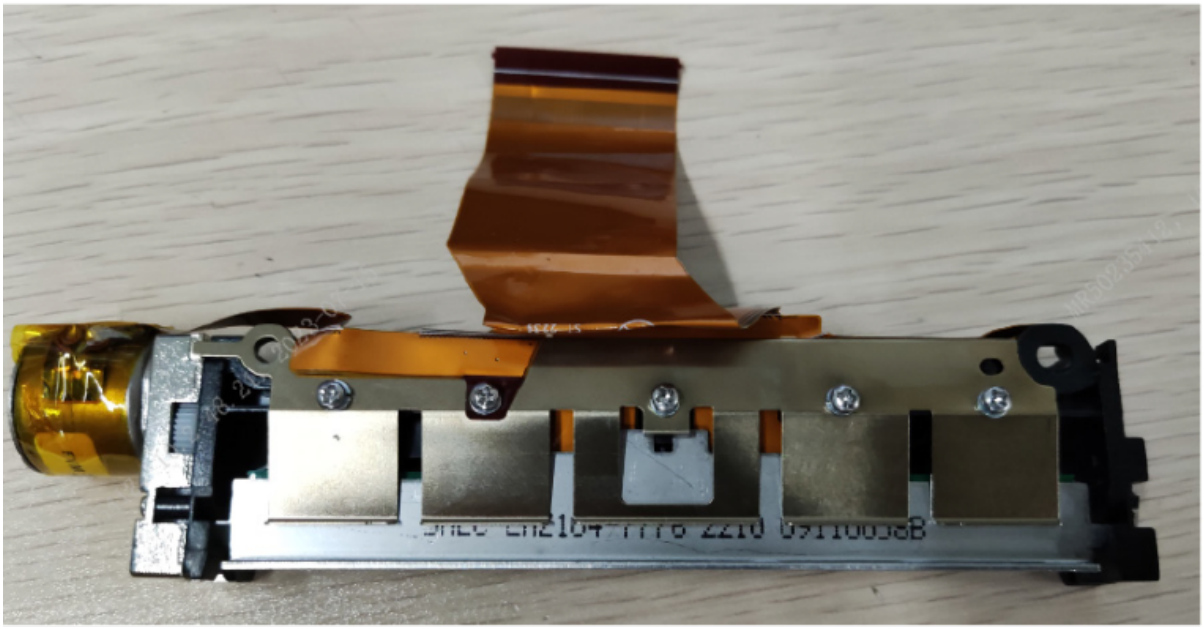
6.19.3 Commissioning and Verification

None

6.20 Thermal Print Head

6.20.1 General Information

Figure6–82

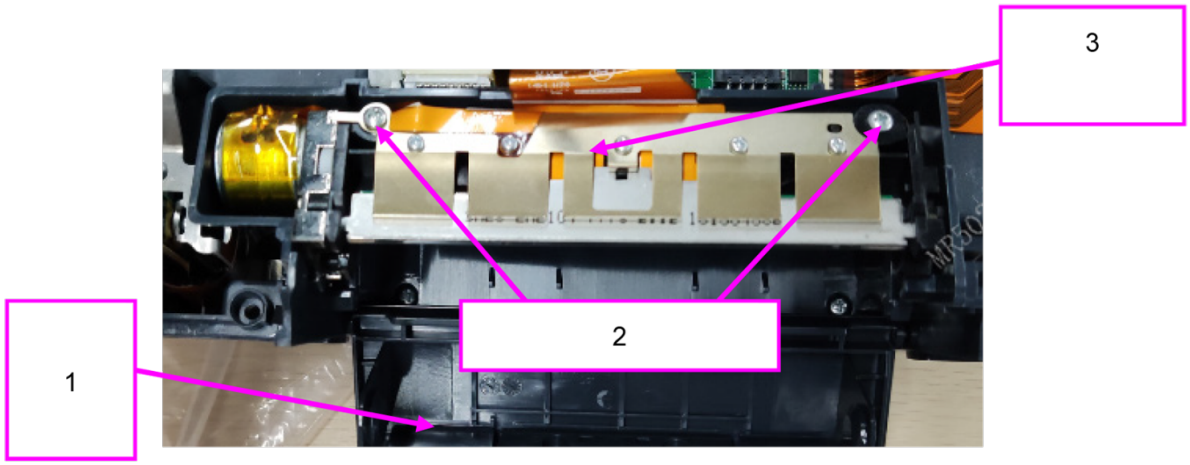


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
024-001345-00	Thermal Print Head	None	None

6.20.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the two PT3X8 crosshead pan head self-tapping screws that fix the recorder drive board. Remove the print head of the recorder. Disassemble the roller of the thermal print head.

Figure6–83



1	Roller of the thermal print head
2	Two PT3X8 self-tapping screws
3	Print head of the recorder

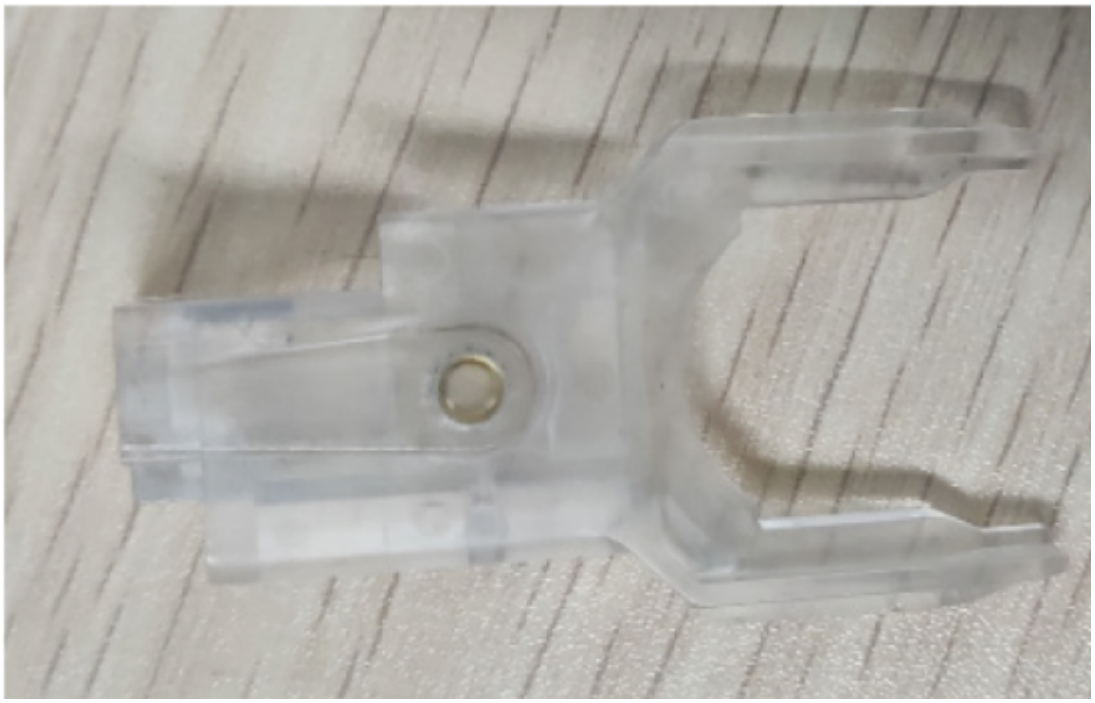
6.20.3 Commissioning and Verification

None

6.21 Pin of Defibrillator (0658)

6.21.1 General Information

Figure6–84

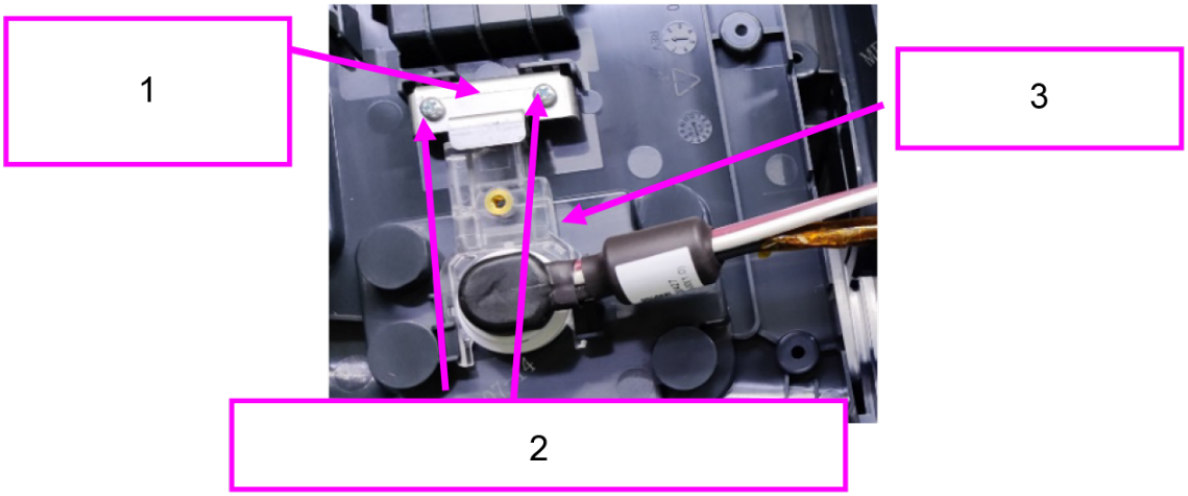


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-016145-00	Pin of Defibrillator (0658)	None	None

6.21.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the two PT3X8 cross recessed pan head self-tapping screws that secure the fixed sheet metal of DX defibrillation interface, remove the pin of defibrillator, and remove the internal wire to defibrillator DX socket.

Figure6–85



1	Fixed sheet metal of DX defibrillation interface
2	Two PT3X8 cross recessed pan head self-tapping screws
3	Pin of Defibrillator

6.21.3 Commissioning and Verification

None

6.22 Rotary Encoder (0658)

6.22.1 General Information

Figure6–86

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-016150-00	Rotary Encoder (0658)	None	None

6.22.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Use tweezers to remove the encoder and replace it.

Figure6–87

6.22.3 Commissioning and Verification

None

6.23 0659 main support (Silkscreen)

6.23.1 General Information

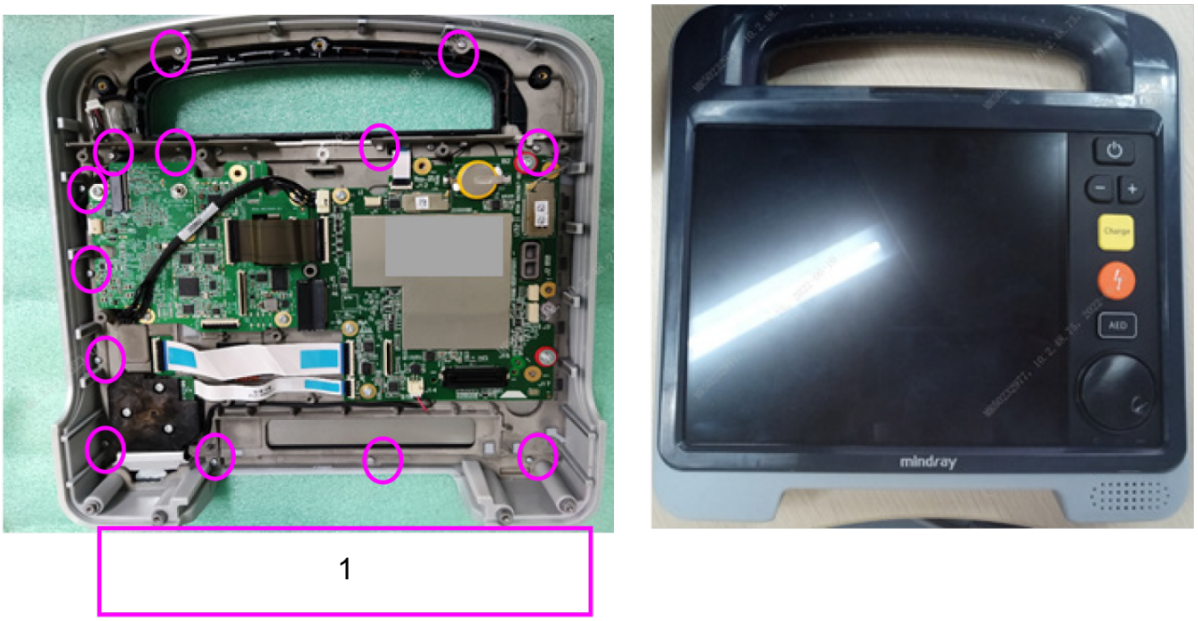
Figure6–88

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-016213-00	0659 main support (Silkscreen)	None	None

6.23.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Use a crosshead screwdriver to remove 13 PT2.6X8 self-tapping screws, and then remove the front shell mask.

Figure6–89



1 13 PT2.6X8 self-tapping screws

4. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.23.3 Commissioning and Verification

None

6.24 0658 silicone keypad substrate(Silkscreen)

6.24.1 General Information

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
049-002628-00	0658 silicone keypad substrate(Silkscreen)	None	None

6.24.2 Disassembly and Assembly

Step

1. Refer to **6.1** Preparation Before Disassembly.
2. Refer to **6.4** Main Unit Disassembly.
3. Disassemble the knob, the encoder board PCBA and the encoder board FFC line. Please refer to the knob, the encoder board PCBA and the encoder board FFC line.
4. Refer to to remove and replace the silicone button.
5. Reinstall the new instrument after replacing the spare parts.

6.24.3 Commissioning and Verification

None

6.25 0659 main support (DM) (Silkscreen)

6.25.1 General Information

Figure6–90

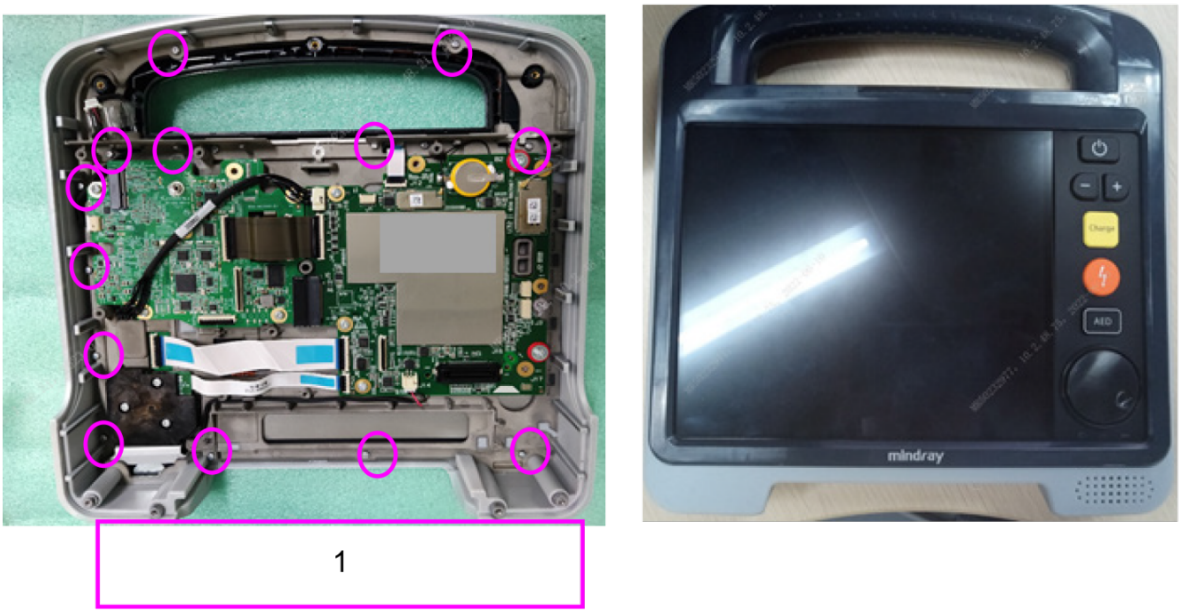
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-016214-00	0659 main support (DM) (Silkscreen)	None	None

6.25.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:

Use a crosshead screwdriver to remove 13 PT2.6X8 self-tapping screws, and then remove the front shell mask.

Figure6–91



1 13 PT2.6X8 self-tapping screws

4. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.25.3 Commissioning and Verification

None

6.26 DX IO port plug (Extracorporal Board) 0659

6.26.1 General Information

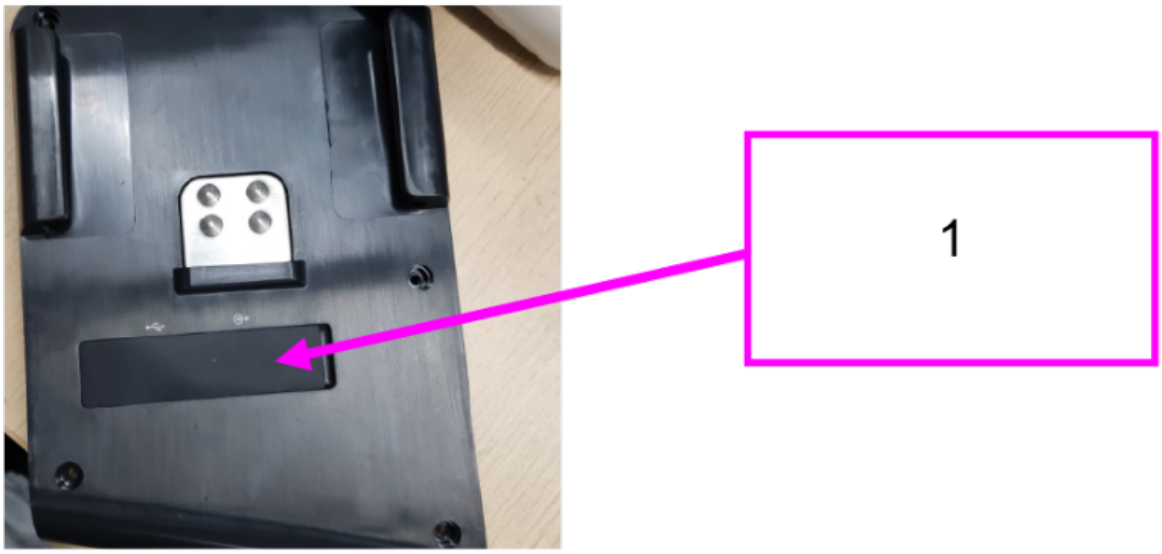
Figure6–92

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-019177-00	DX IO port plug (Extracorporal Board) 0659	None	None

6.26.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. Specific steps:
   Use needle-nose pliers to remove and replace the plug.

Figure6–93



1 DX IO port plug (Extracorporal Board) 0659

6.26.3 Commissioning and Verification

None

6.27 USB (Silicon Plug) (DX)

6.27.1 General Information

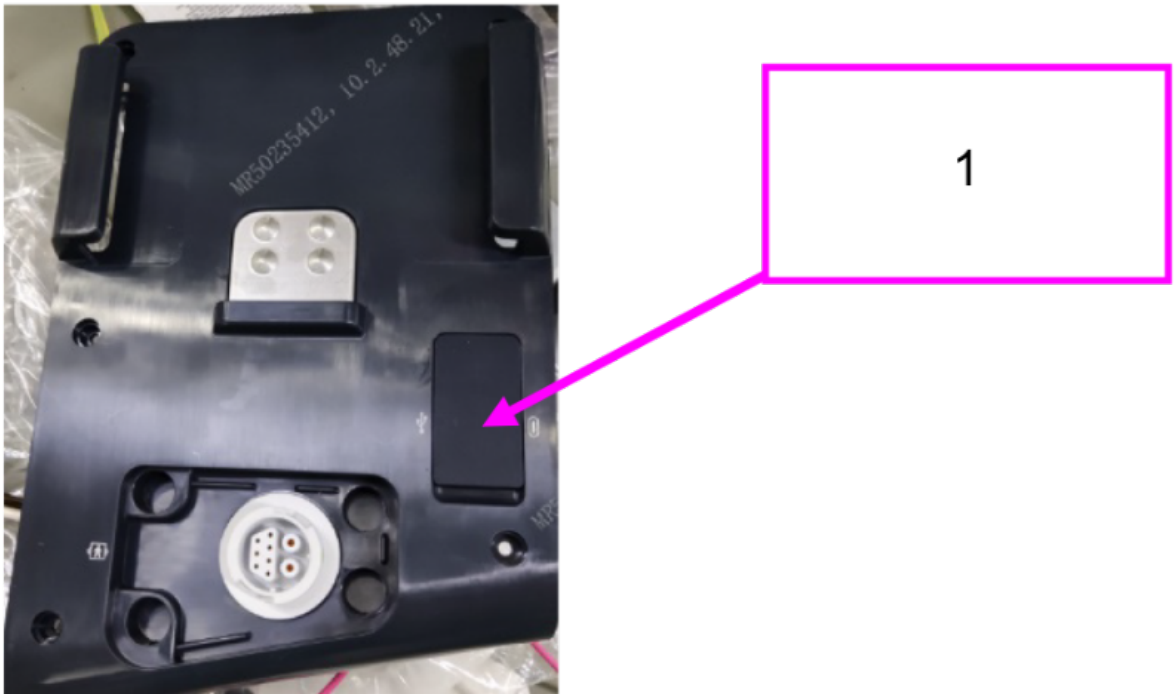
Figure6–94

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
043-019780-00	USB (Silicon Plug) (DX)	None	None

6.27.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
4. Specific steps:
   Use needle-nose pliers to remove the plug.

Figure6–95



1 USB (Silicon Plug) (DX)

6.27.3 Commissioning and Verification

None

6.28 Insulation Sheet of DX Power Conversion to Therapy Board

6.28.1 General Information

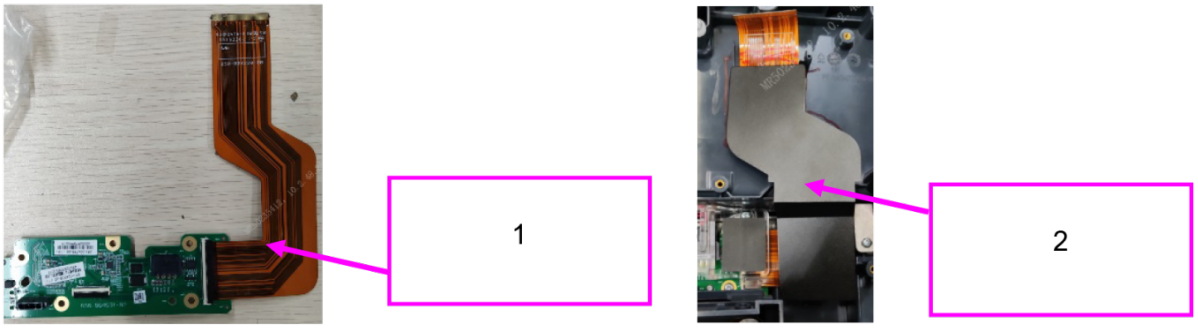
Figure6–96

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
047-046530-00	Insulation Sheet of DX Power Conversion to Therapy Board	None	None

6.28.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 DX Power Adapter Board, see the 0659 DX Power Adapter Board **6.45.2** Disassembly and Assembly.
4. Specific steps:
   Remove the Insulation Sheet of DX Power Conversion to Therapy Board.

Figure6–97



1 DX Power Conversion to Therapy Board

2 Insulation Sheet of DX Power Conversion to Therapy Board

6.28.3 Commissioning and Verification

None

6.29 DX Pad Package

6.29.1 General Information

Figure6–98

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
048-012890-00	DX Pad Package	None	None

6.29.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Replace the package directly after removing it.

Figure6–99

1 DX Pad Package

6.29.3 Commissioning and Verification

None

6.30 D60 Silicon Key (Silkscreen)

6.30.1 General Information

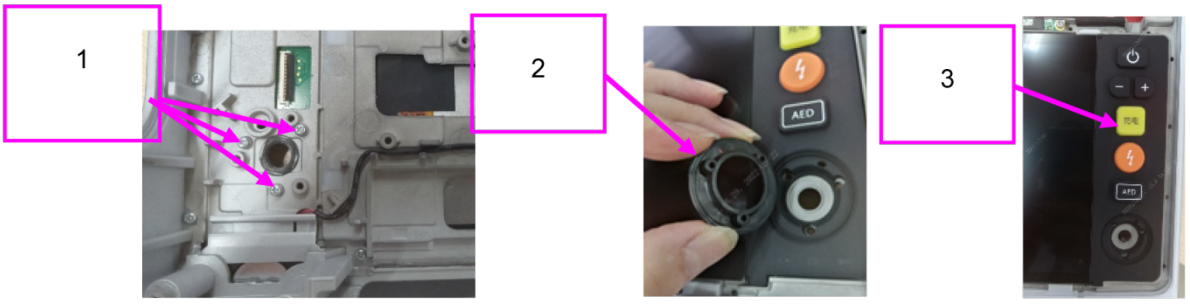
Figure6–100

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
049-002628-00	0658 Silicon Key	None	None

6.30.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of Rotary Encoder (0658) and 0659 Main Support (Silkscreen), see Rotary Encoder (0658) **6.22.2** Disassembly and Assembly and 0659 Main Support (Silkscreen) **6.23.2** Disassembly and Assembly.
4. Use a crosshead screwdriver to remove 3 PT2.6X8 self-tapping screws, remove the knob bracket, and remove the silicone keys.

Figure6–101



1	13 PT2.6X8 self-tapping screws
2	Knob bracket
3	Silicon key

5. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.30.3 Commissioning and Verification

None

6.31 IO Port Silicon Plug of DX Host

6.31.1 General Information

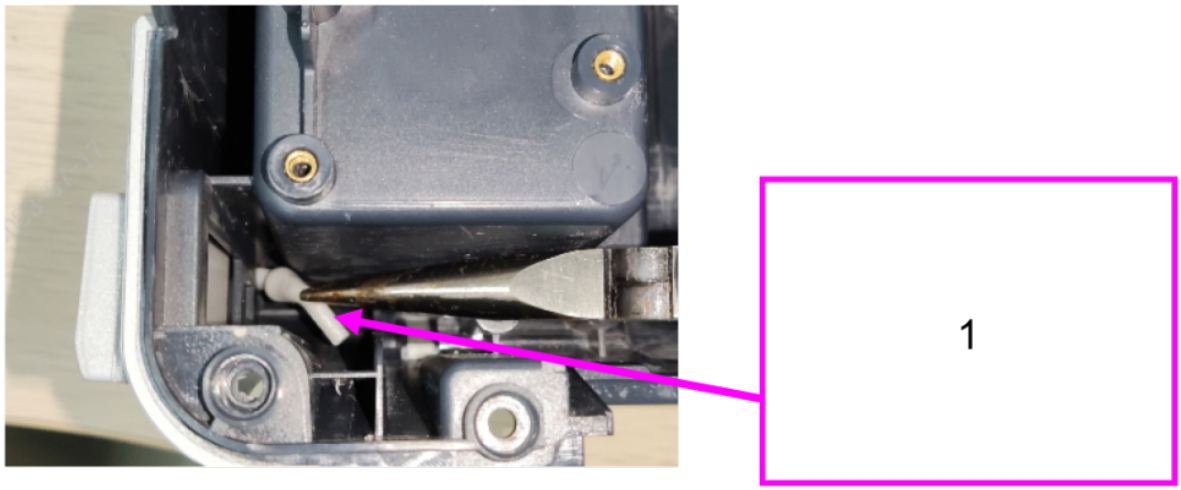
Figure6–102

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
049-002749-00	IO Port Silicon Plug of DX Host	None	None

6.31.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of IO Interface Board of DX Host, see IO Interface Board of DX Host **6.43.2** Disassembly and Assembly.
4. Specific steps:
   Use needle-nose pliers to pull out the silicone plug of the IO interface and replace it.

Figure6–103



1 IO Port Silicon Plug of DX Host

6.31.3 Commissioning and Verification

None

6.32 0656 USB Port Silicon Plug

6.32.1 General Information

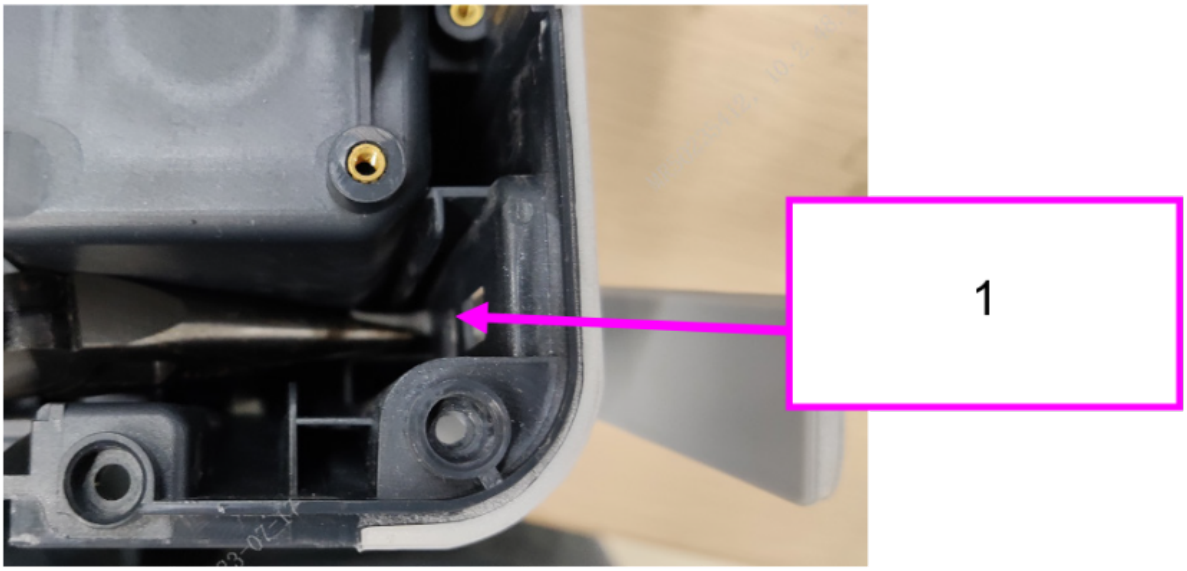
Figure6–104

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
049-002750-00	0656 USB Port Silicon Plug	None	None

6.32.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
4. Specific steps:
   Use needle-nose pliers to remove the plug.

Figure6–105



1 0656 USB Port Silicon Plug

6.32.3 Commissioning and Verification

None

6.33 Network Port Silicon Plug

6.33.1 General Information

Figure6–106

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
049-002751-00	Network Port Silicon Plug	None	None

6.33.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.
4. Specific steps:
   Use needle-nose pliers to remove the plug.

Figure6–107

1 Network Port Silicon Plug

6.33.3 Commissioning and Verification

None

6.34 0656 D60 iView FPC

6.34.1 General Information

Figure6–108

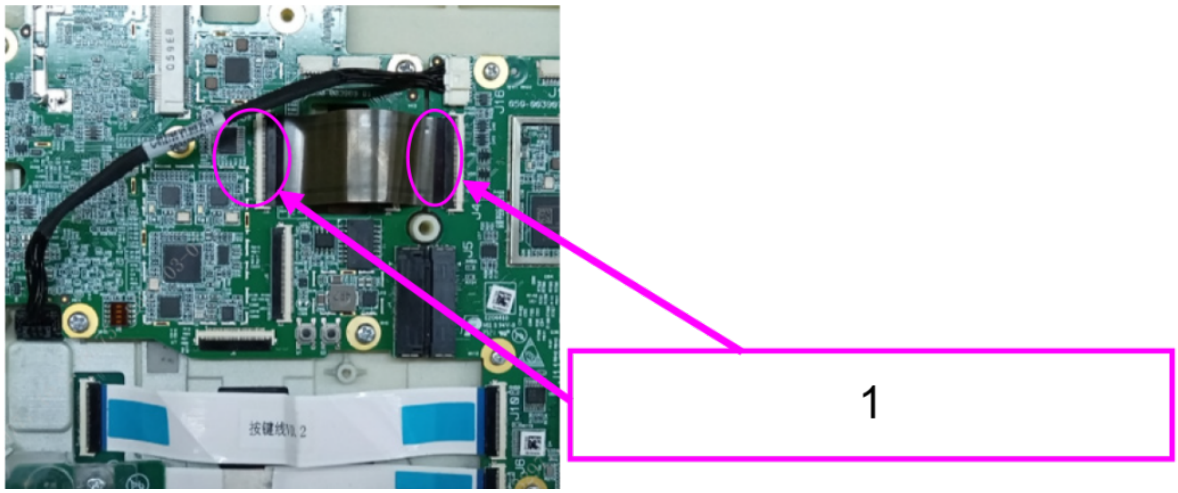
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
050-003998-02	0656 D60 iView FPC	None	None

6.34.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:

1) Open the FPC clips of 0656 D60 iView FPC on the main control board and slave board, remove the FPC cable, and replace it.

Figure6–109



1 Remove the FPC cable connecting the slave board to the main control board.

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

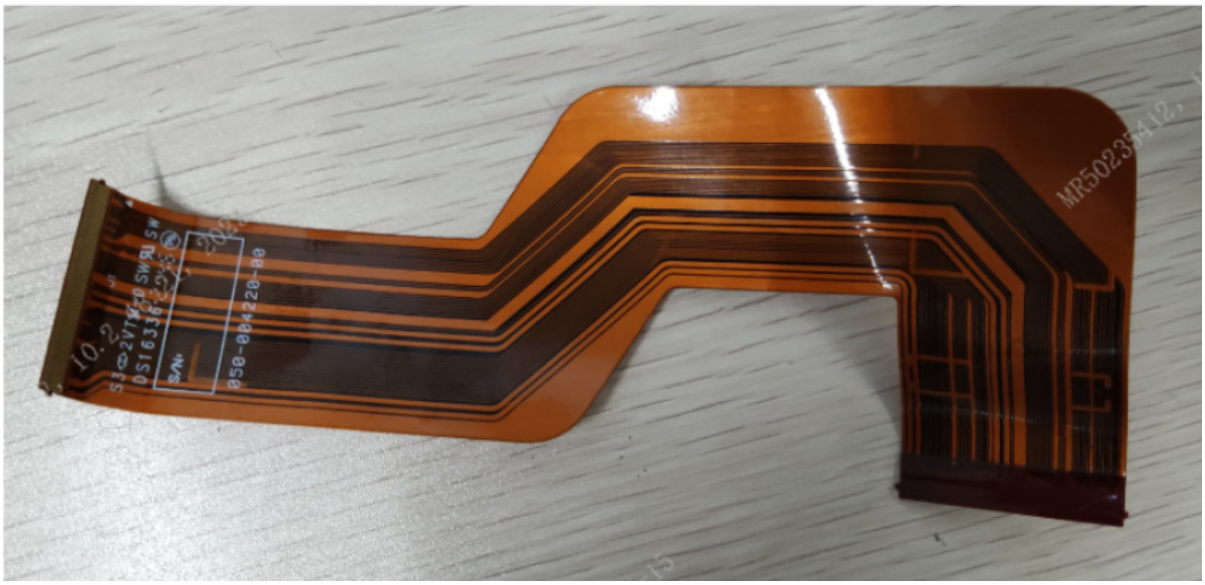
6.34.3 Commissioning and Verification

None

6.35 DX Power Conversion to Therapy Board

6.35.1 General Information

Figure6–110

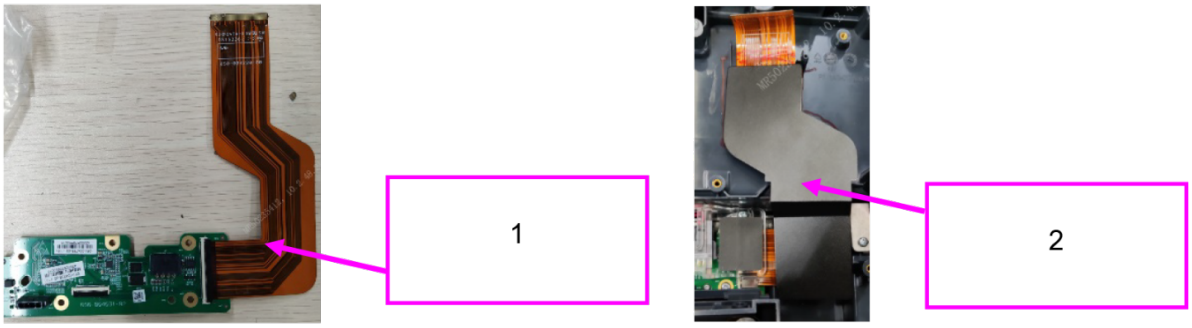


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
050-004220-01	DX Power Conversion to Therapy Board	None	None

6.35.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 DX Power Adapter Board, see the 0659 DX Power Adapter Board **6.45.2** Disassembly and Assembly.
4. Specific steps:
   Remove the Insulation Sheet of DX Power Conversion to Therapy Board.

Figure6–111



1 DX Power Conversion to Therapy Board

2 Insulation Sheet of DX Power Conversion to Therapy Board

6.35.3 Commissioning and Verification

None

6.36 Cable connecting the external interface board and battery co

6.36.1 General Information

Figure6–112

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
050-004412-00	Cable connecting the external interface board and battery connect board FPC	None	None

6.36.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.

6.36.3 Commissioning and Verification

None

6.37 Cable connecting the external interface board and battery co

6.37.1 General Information

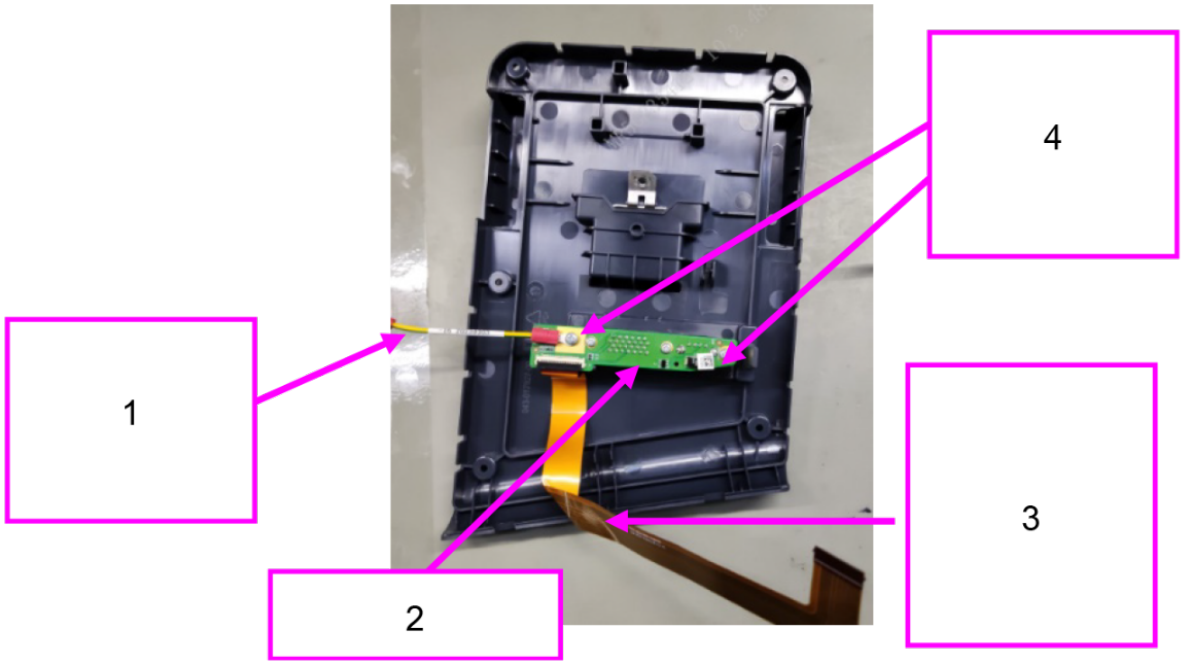
Figure6–113

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
050-004819-00	Cable connecting the external interface board and battery connect board FPC	None	None

6.37.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two PT3X8 cross recessed pan head screws that secure the Type-C interface board assembly and the external interface board. Remove the cable connecting the external interface board and battery connect board FPC.

Figure6–114



1	Grounding Cable of Type-C Interface Board
2	External Interface Board
3	Cable connecting the external interface board and battery connect board FPC
4	Two PT3X8 cross recessed pan head self-tapping screws

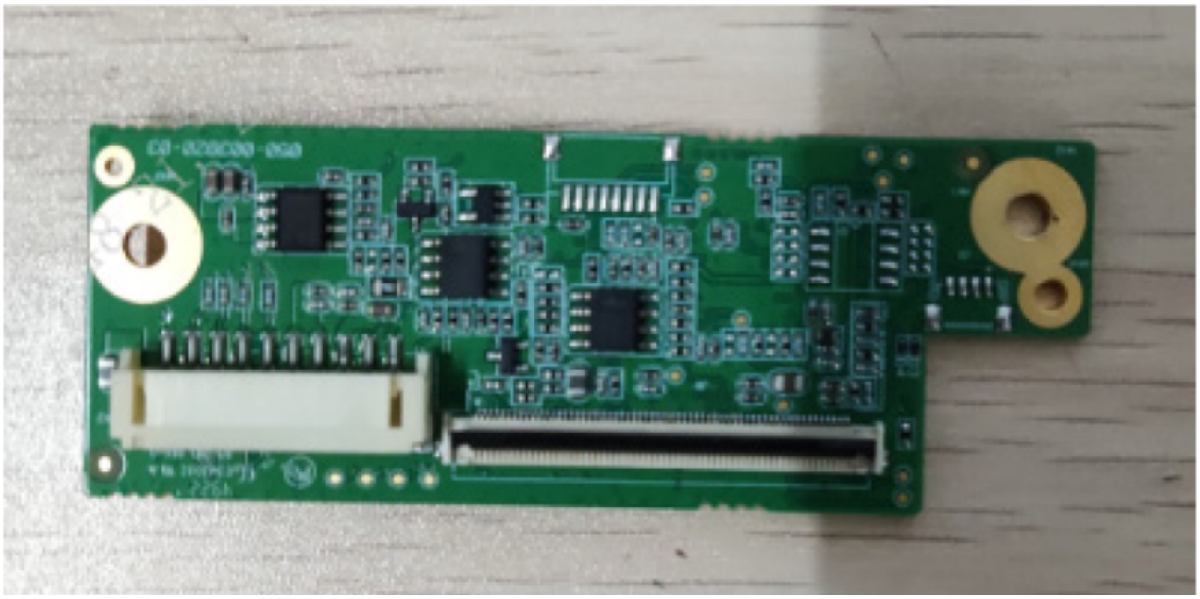
6.37.3 Commissioning and Verification

None

6.38 110mm REC Drive Board

6.38.1 General Information

Figure6–115

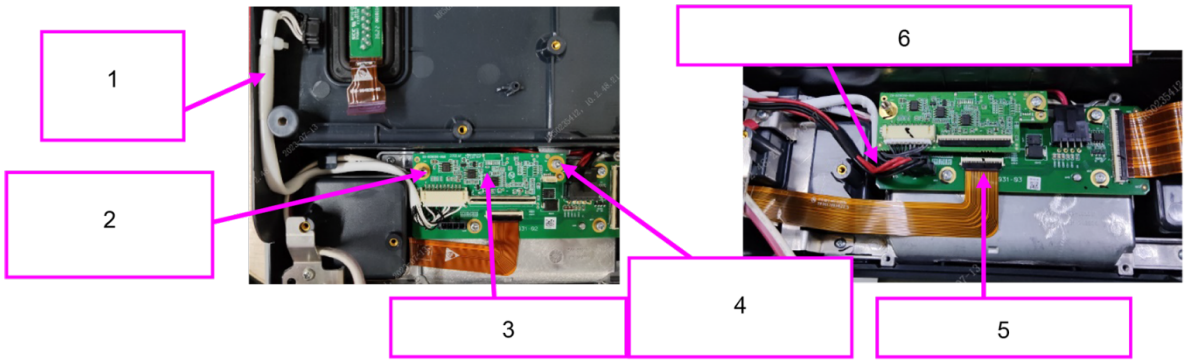


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004595-00	110mm REC Drive Board	None	None

6.38.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove one M3X6 cross recessed pan head screw that fixes the recorder drive board. Use needle-nose pliers to remove one M3X6 stud screw that fixes the recorder drive board. Remove the recorder drive board and recorder cable.

Figure6–116



1	Recorder Cable
2	One M3X6 stud screw
3	Recorder drive board
4	One M3X6 cross recessed pan head screw
5	External interface FPC board
6	DC Input Cable of Defibrillator DX Power Parameter Board

6.38.3 Commissioning and Verification

None

6.39 0656 D60 Main-Power Board FPC PCBA

6.39.1 General Information

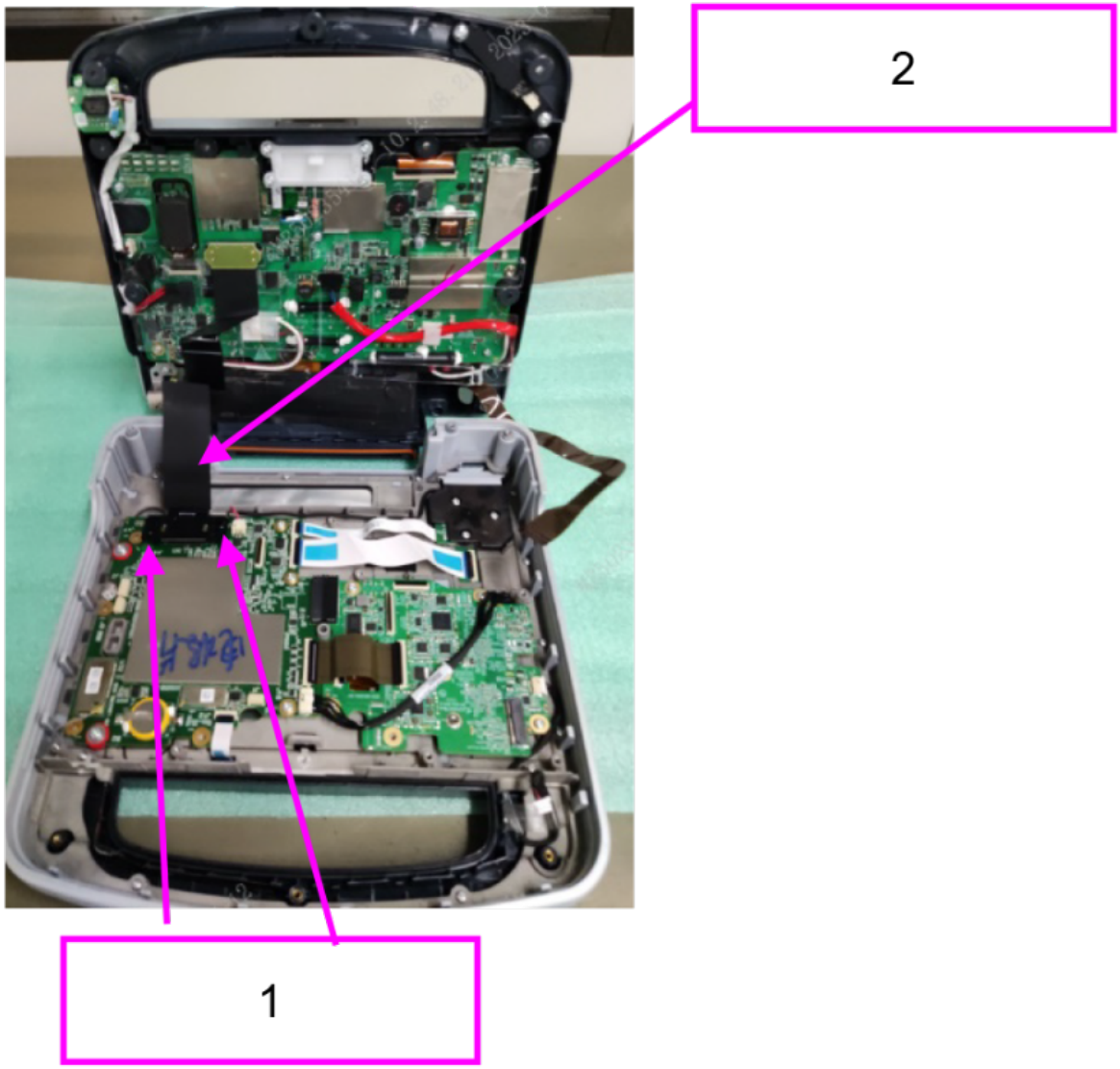
Figure6–117

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004674-00	0656 D60 Main-Power Board FPC PCBA	None	None

6.39.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Unplug the front and rear shell connection cables from the integrated board and separate the front and rear shells. Pull out two black nylon rivets, remove the one black socket cover on the front shell, and pull out the front and rear shell connection cables.

Figure6–118



1 Two black nylon rivets

2 Front-rear shell connector

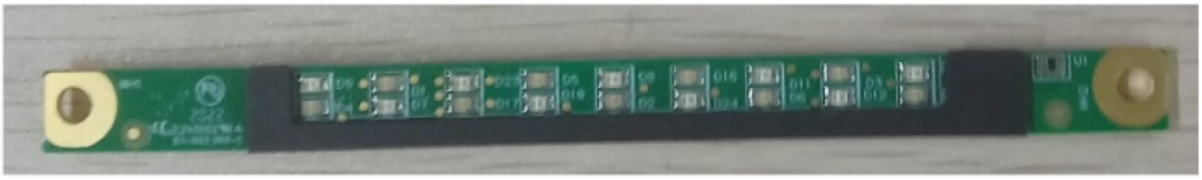
6.39.3 Commissioning and Verification

None

6.40 0656 D60 Alarm PCBA

6.40.1 General Information

Figure6–119



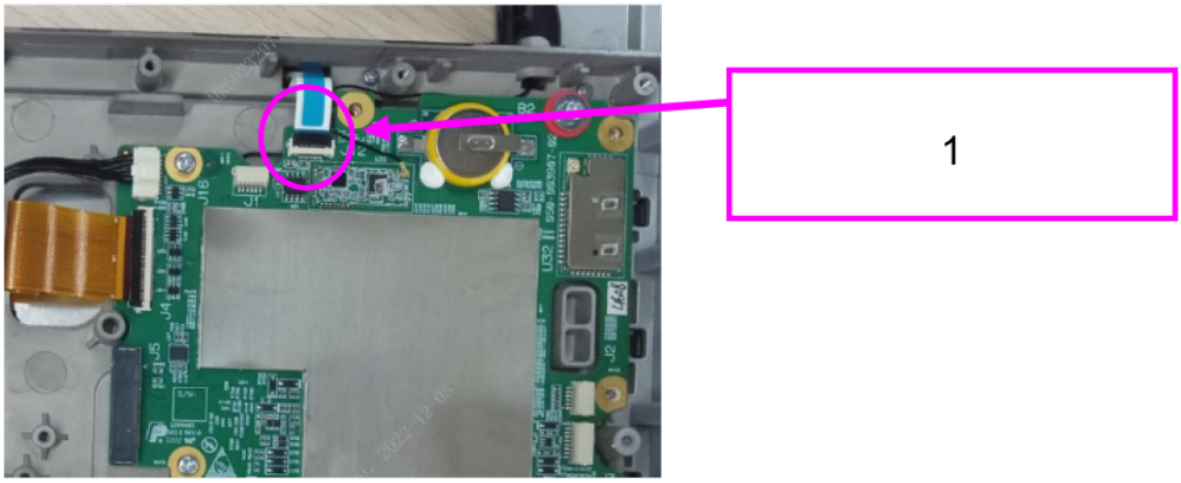
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004699-00	0656 D60 Alarm PCBA	None	None

6.40.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 main support (Silkscreen), see 0659 main support (Silkscreen) **6.23.2** Disassembly and Assembly.
4. Specific steps:

1) Remove the FFC plug between the alarm LED and the main control board, and then take out the alarm LED PCBA and replace it.

Figure6–120



1 Disassemble the alarm LED FFC cable.

2) Use a crosshead screwdriver to remove the two M3X6 cross recessed pan head screws from the alarm lamp board and then remove the alarm lamp board and the alarm lamp board FFC cable.

Figure6–121

1 2 M3X6 screws

2 Alarm lamp FFC cable

6.40.3 Commissioning and Verification

None

6.41 0656 D60 Coder PCBA

6.41.1 General Information

Figure6–122

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004701-00	0656 D60 Coder PCBA	None	None

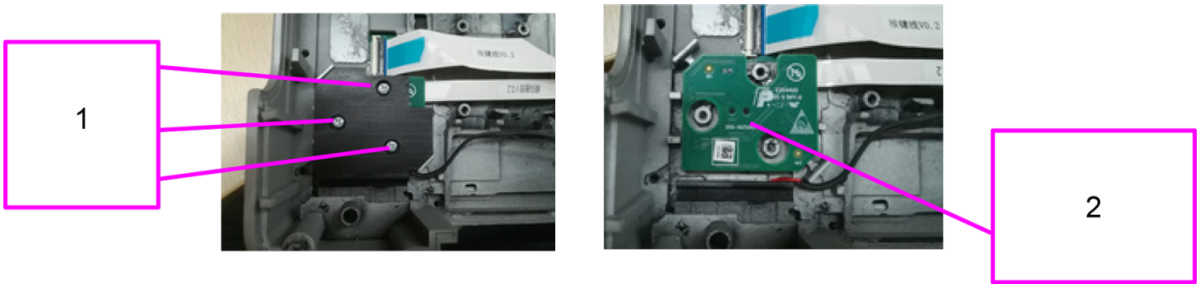
6.41.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. If 4G/5G/Wi-Fi function is configured, follow the procedure below:

For the disassembly of the 4G/5G/Wi-Fi Board Assy, see the 4G **6.56.2** Disassembly and Assembly/5G **6.57.2** Disassembly and Assembly/Wi-Fi Board Assy **6.55.2** Disassembly and Assembly.

4. For the disassembly of Rotary Encoder (0658), see Rotary Encoder (0658) **6.22.2** Disassembly and Assembly.
5. Use a crosshead screwdriver to remove the three M3X6 cross recessed pan head screws on the encoder gland, and remove the encoder gland. Remove the encoder board PCBA.

Figure6–123



1	3 M3X6 screws
2	0656 D60 Coder PCBA

6.41.3 Commissioning and Verification

None

6.42 0656 DX Network Interface Board PCBA

6.42.1 General Information

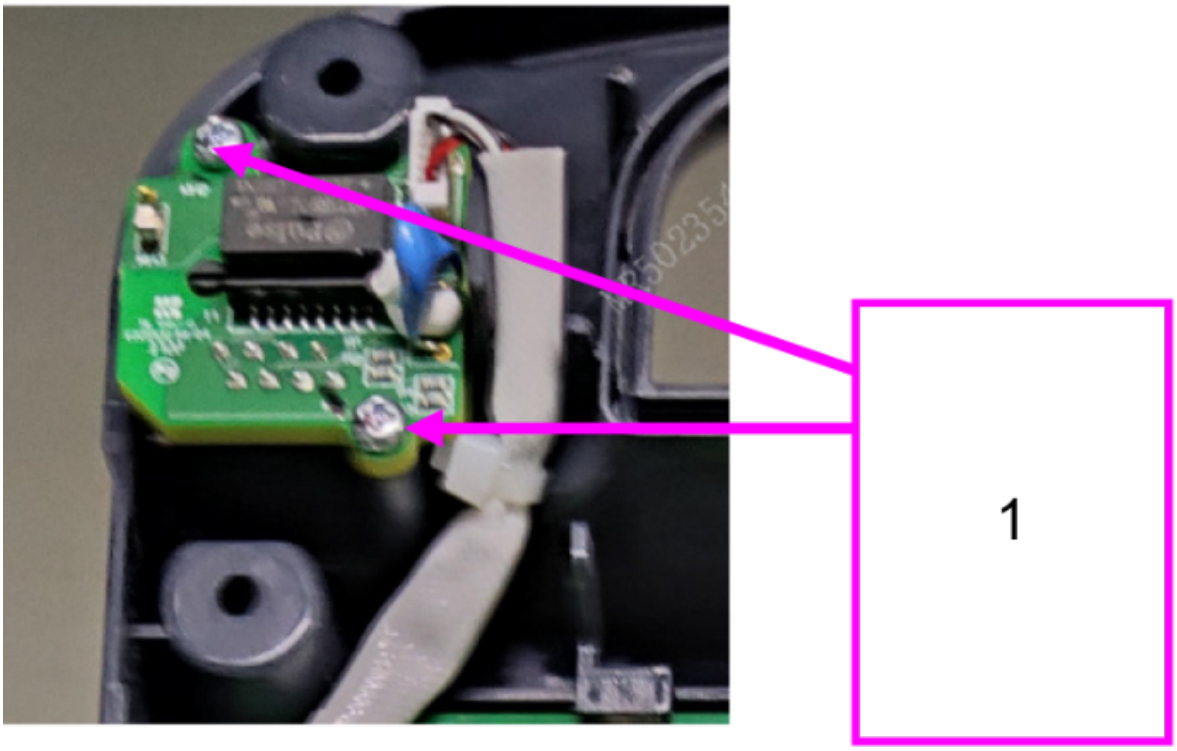
Figure6–124

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004743-00	0656 DX Network Interface Board PCBA	None	None

6.42.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of DX Network Cable, see DX Network Cable **6.8.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the two PT2.6X8 self-tapping screws that fix the interface board. Unplug the DX network cable from the board socket.

Figure6–125



1 2 PT2.6X8 self-tapping screws

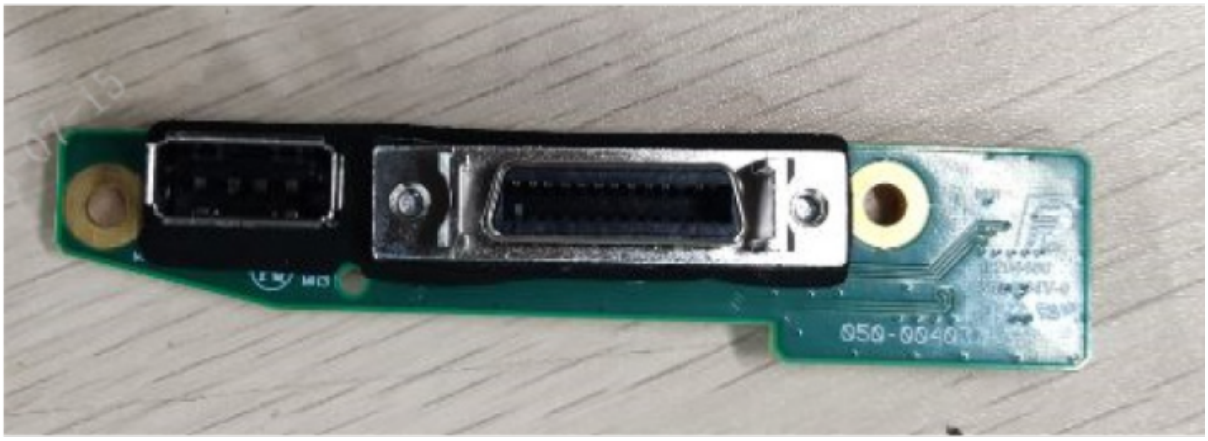
6.42.3 Commissioning and Verification

None

6.43 IO Interface Board of DX Host

6.43.1 General Information

Figure6–126



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-004746-00	IO Interface Board of DX Host	None	None

6.43.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.

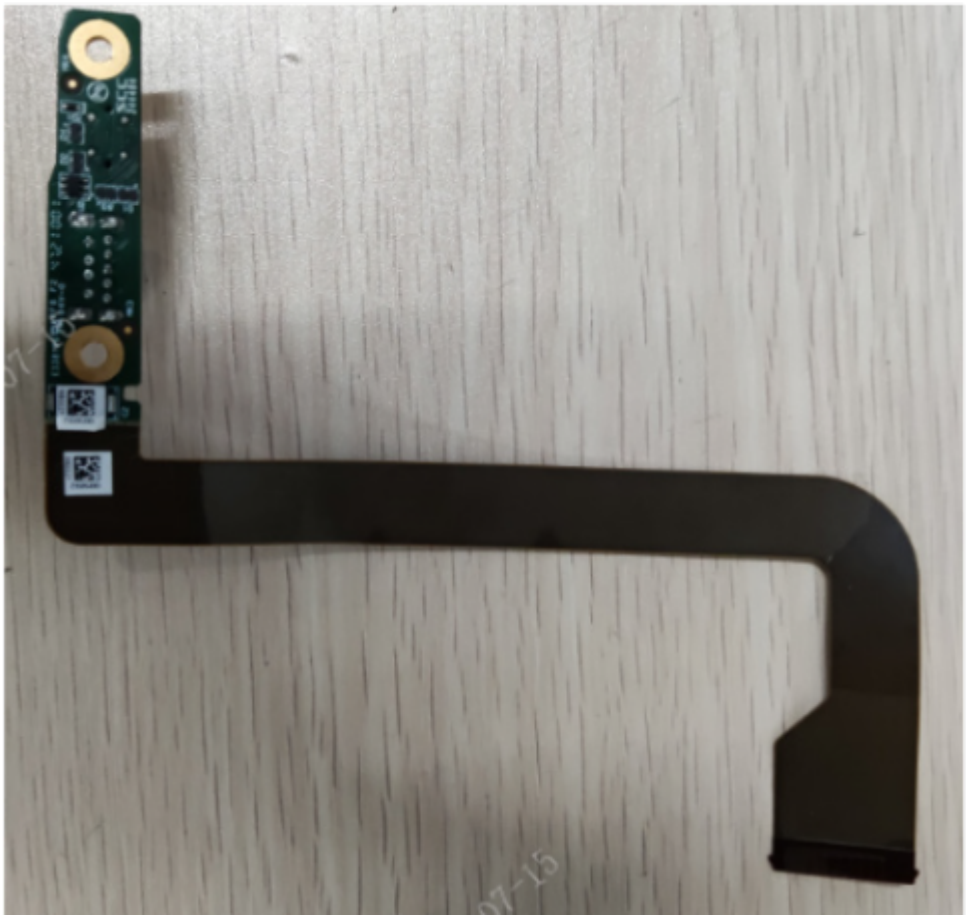
6.43.3 Commissioning and Verification

None

6.44 0656 USB 3.0 Type-C Interface Board (DX)

6.44.1 General Information

Figure6–127

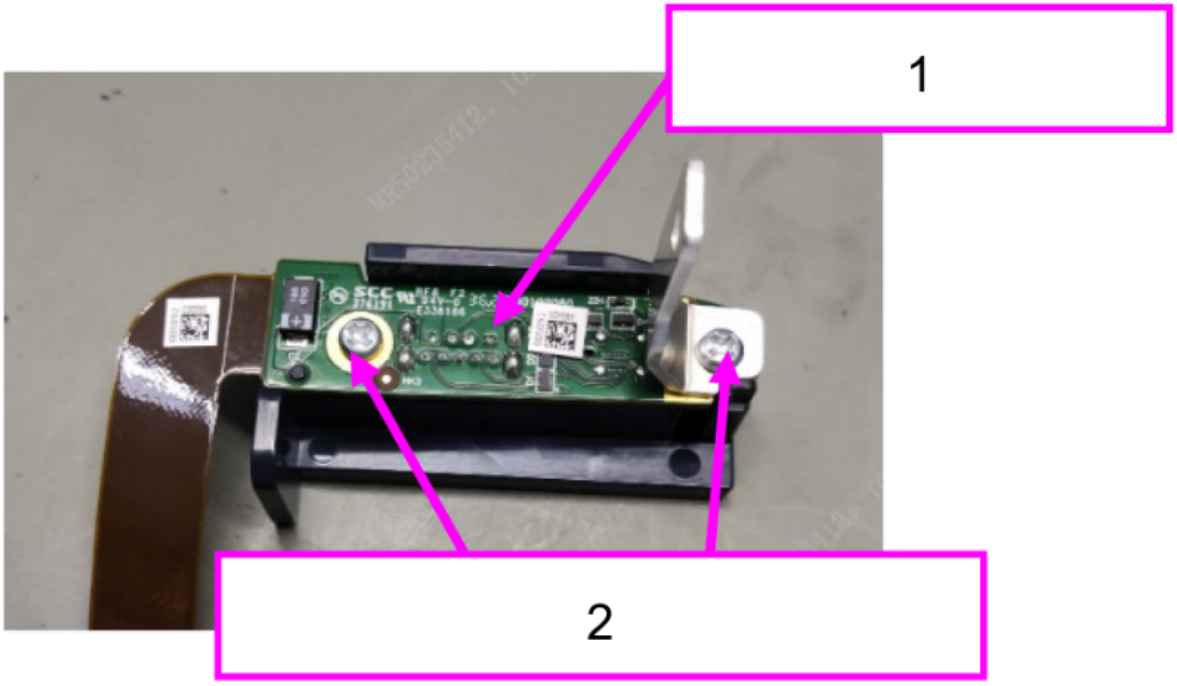


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-005092-00	0656 USB 3.0 Type-C Interface Board (DX)	None	None

6.44.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the Type-C interface board, and then remove the board from the rear shell.

Figure6–128



1	Type-C interface board
2	Two M3X6 cross recessed pan head screws

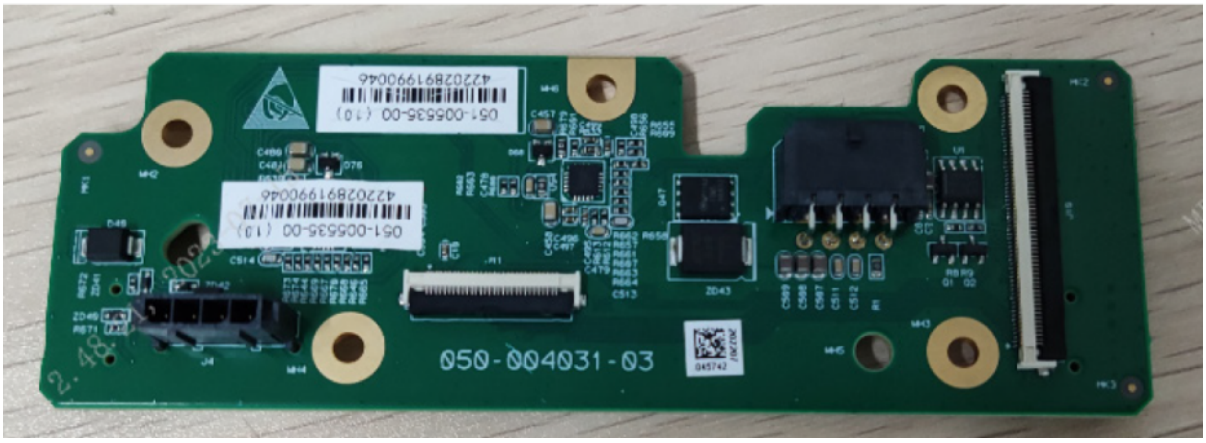
6.44.3 Commissioning and Verification

None

6.45 DX Power Adapter Board

6.45.1 General Information

Figure6–129



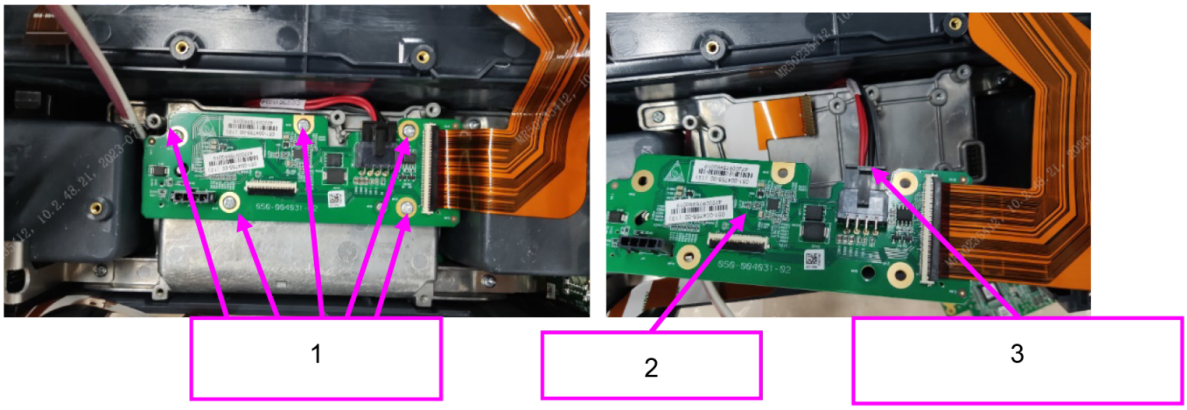
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-005535-00	0659 DX Power Adapter Board	None	None

6.45.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 110mm REC Drive Board, see 110mm REC Drive Board **6.38.2** Disassembly and Assembly.
4. For the disassembly of DC Input Cable of Defibrillator DX Power Parameter Board, see DC Input Cable of Defibrillator DX Power Parameter Board **6.9.2** Disassembly and Assembly.
5. Specific steps:

1) Use a crosshead screwdriver to remove five M3X6 cross recessed pan head screws that secure the power adapter board. After pulling the board upwards from the metal bracket, pull out the magnetic terminals from the board socket.

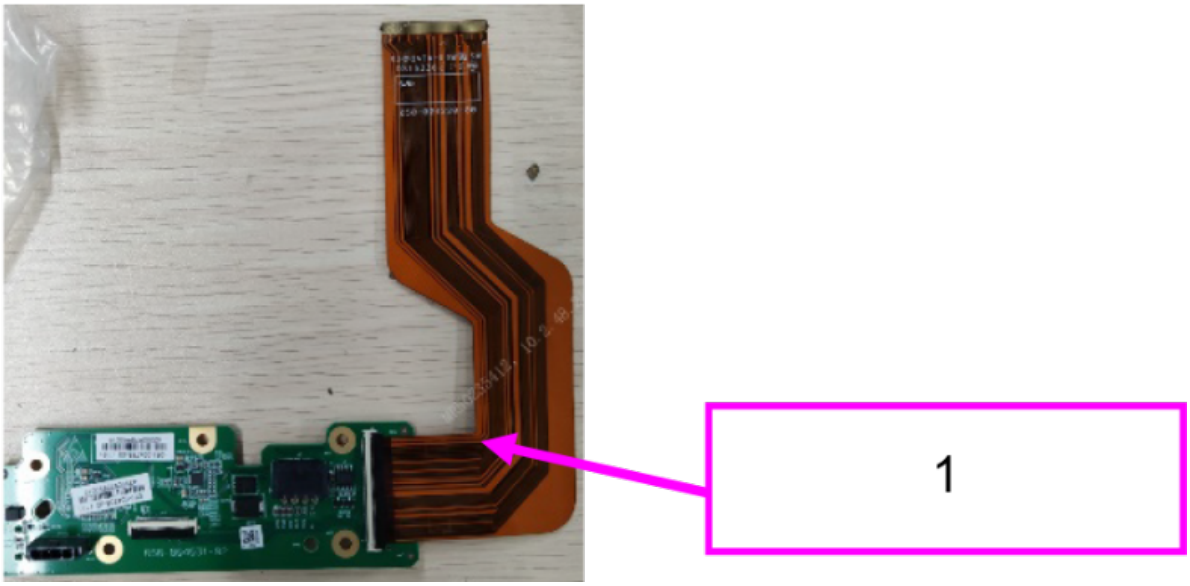
Figure6–130



1	Five M3X6 cross recessed pan head screws
2	Power Adapter Board
3	Pulling out the magnetic terminals from the board socket

2) Remove the Insulation Sheet of DX Power Conversion to Therapy Board.

Figure6–131



1 DX Power Conversion to Therapy Board

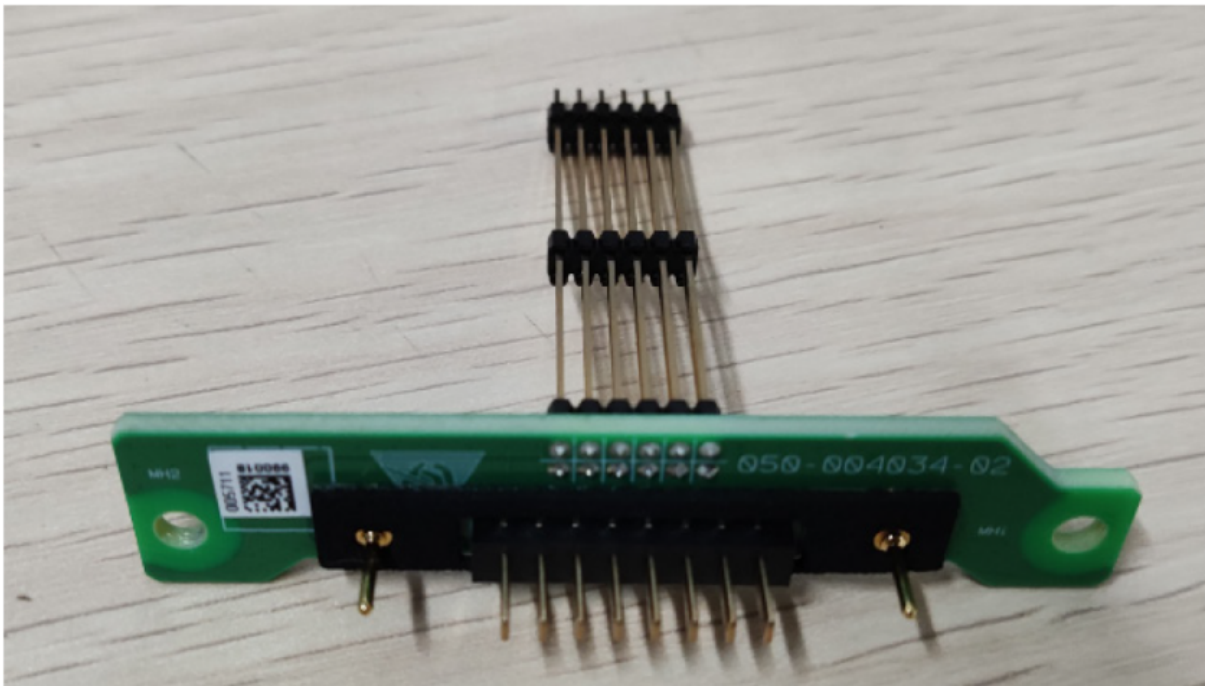
6.45.3 Commissioning and Verification

None

6.46 DX Battery Backplate

6.46.1 General Information

Figure6–132

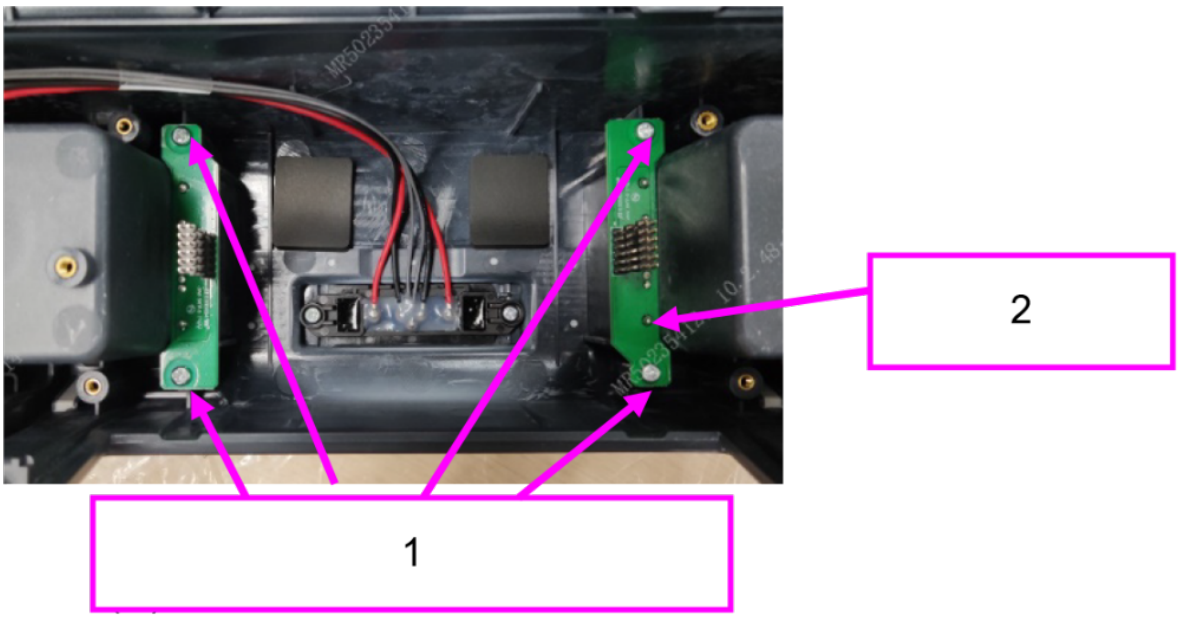


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-005536-00	0659 DX Battery Backplate	None	None

6.46.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0656 Large Capacitance Cable, see 0656 Large Capacitance Cable **6.11.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the four M3X6 cross recessed pan head screws that secure the left and right battery backplates (if the equipment is configured with paddles, remove the four PT3X8 cross recessed pan head self-tapping screws), and remove the battery backplates from the rear shell.

Figure6–133



1	Four M3X6 cross recessed pan head screws
2	Battery Backplate

6.46.3 Commissioning and Verification

None

6.47 0659 DX Battery Backplate (Paddle)

6.47.1 General Information

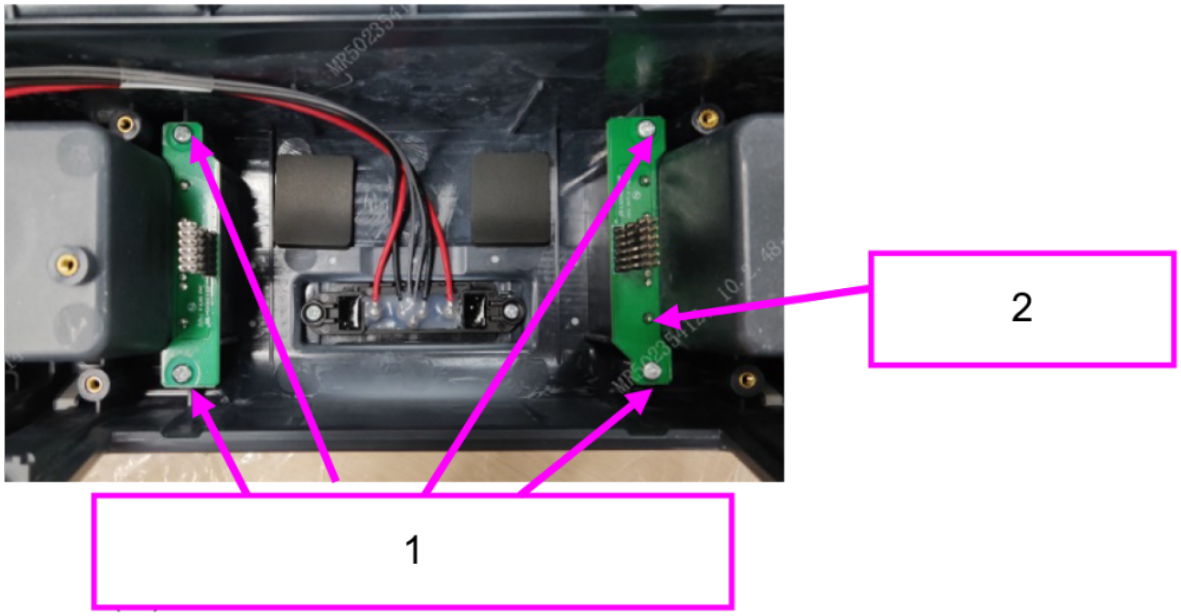
Figure6–134

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
051-005711-00	0659 DX Battery Backplate (Paddle)	None	None

6.47.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0656 Large Capacitance Cable, see 0656 Large Capacitance Cable **6.11.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the four M3X6 cross recessed pan head screws that secure the left and right battery backplates (if the equipment is configured with paddles, remove the four PT3X8 cross recessed pan head self-tapping screws), and remove the battery backplates from the rear shell.

Figure6–135



1 Four M3X6 cross recessed pan head screws

2 Battery Backplate

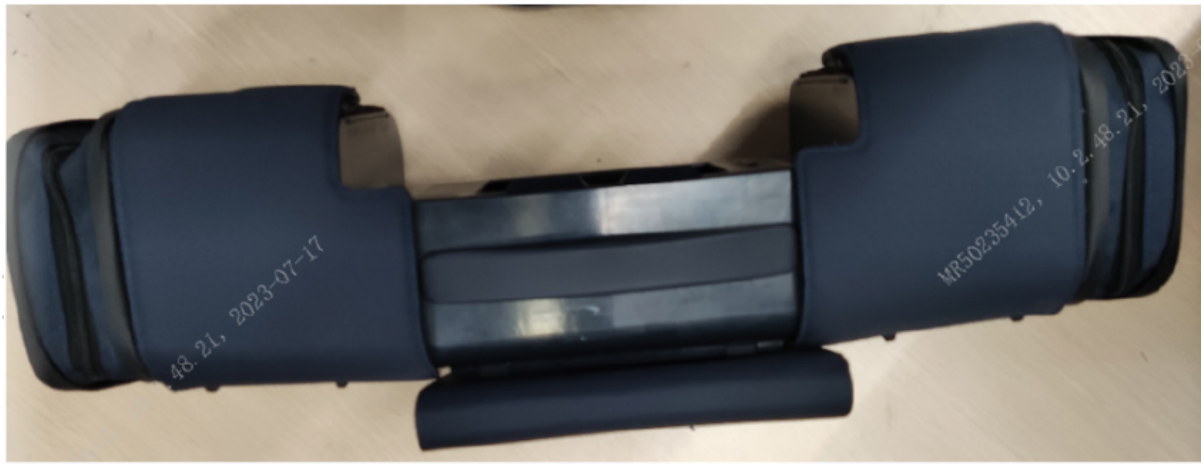
6.47.3 Commissioning and Verification

None

6.48 N1 Module Rack (Pad and Portable Kit)

6.48.1 General Information

Figure6–136



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-088061-00	N1 Module Rack (Pad and Portable Kit)	None	None

6.48.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Press the unlocking knob and directly replace the module rack.

Figure6–137

1 Unlocking knob package

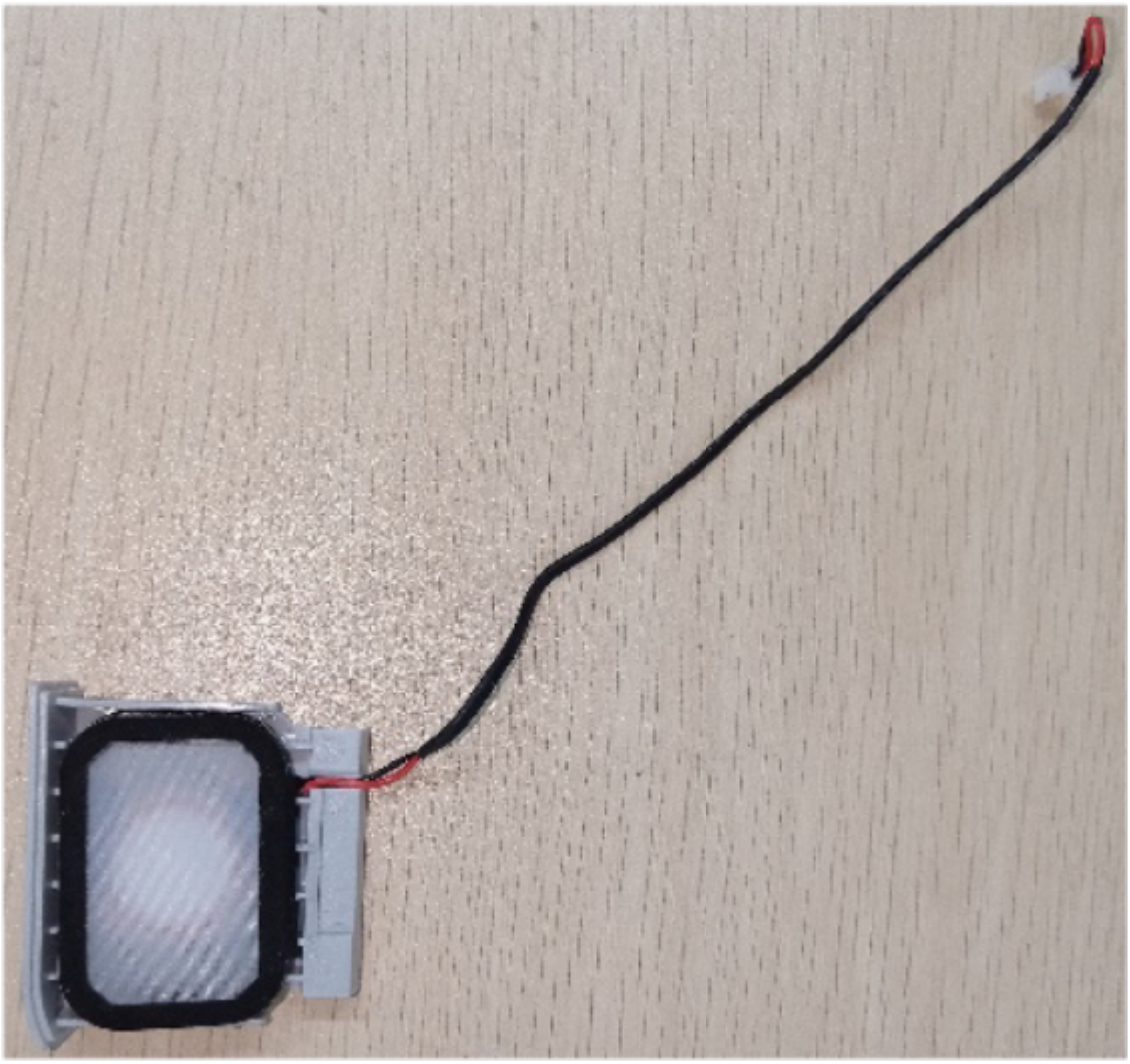
6.48.3 Commissioning and Verification

None

6.49 Speaker FRU

6.49.1 General Information

Figure6–138



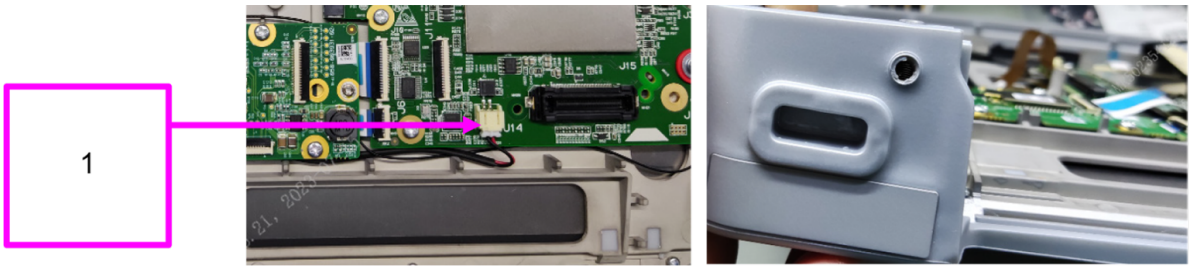
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090682-00	Speaker FRU	None	None

6.49.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.

2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0656 D60 Coder PCBA, see 0656 D60 Coder PCBA **6.41.2** Disassembly and Assembly.
4. Unplug the speaker cable from the main control board and remove the speaker assembly from the front shell for replacement.

Figure6–139



1 Unplug the speaker cable from the main control board

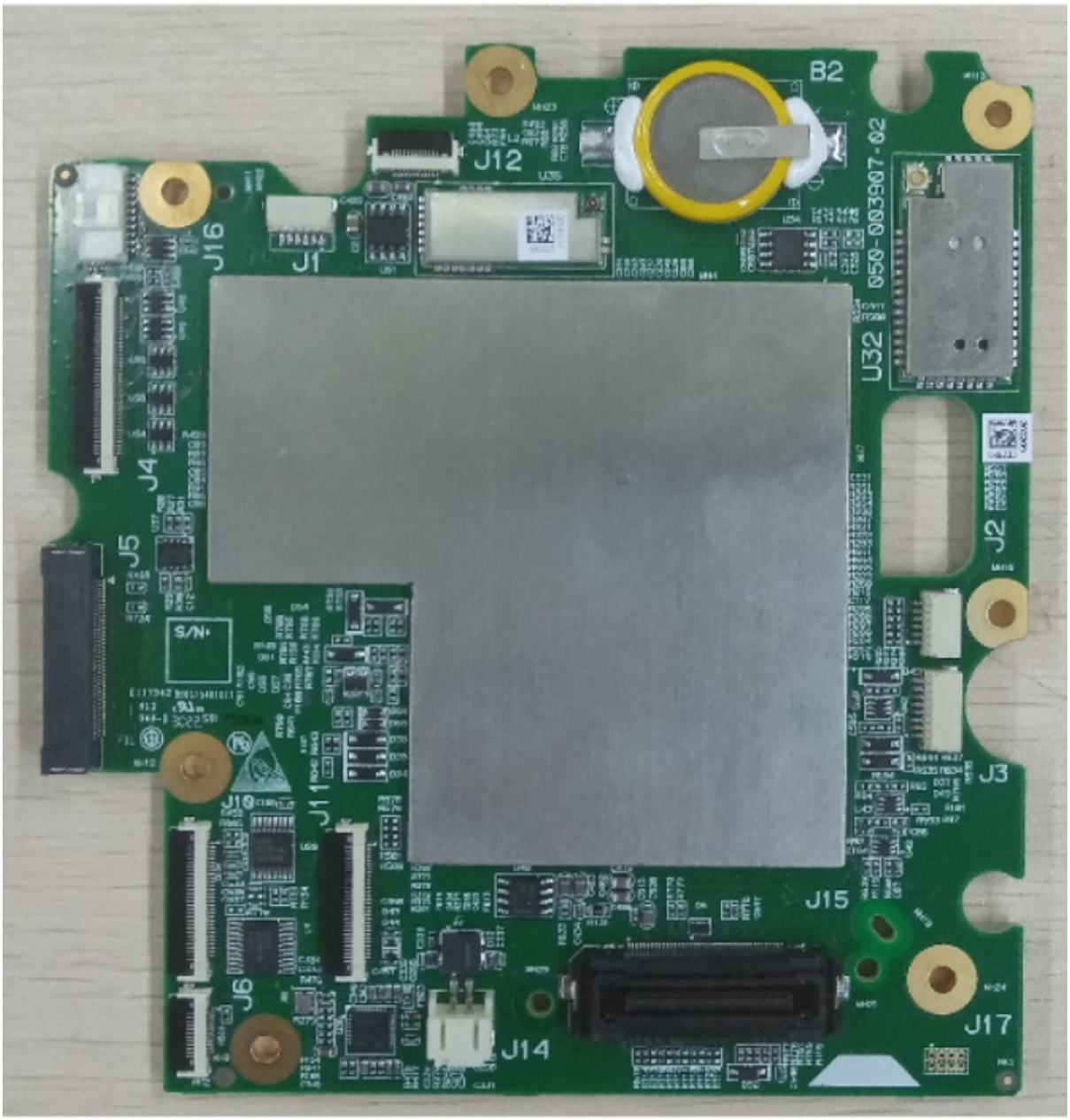
6.49.3 Commissioning and Verification

None

6.50 0658 Main Board PCBA FRU

6.50.1 General Information

Figure6–140



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090684-00	0658 Main Board PCBA FRU	None	None

6.50.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. If 4G/5G/Wi-Fi function is configured, follow the procedure below:
   For the disassembly of the 4G/5G/Wi-Fi Board Assy, see the 4G **6.56.2** Disassembly and Assembly/5G **6.57.2** Disassembly and Assembly/Wi-Fi Board Assy **6.55.2** Disassembly and Assembly.
4. For the disassembly of the slave board PCBA and cable connecting the slave board and the main control board FPC, see slave board PCBA and cable connecting the slave board and the main control board FPC **6.54.2** Disassembly and Assembly.
5. For the disassembly of the main control board PCBA, see main control board PCBA **6.50.2** Disassembly and Assembly. Remove the main control board, and replace it.
6. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.50.3 Commissioning and Verification

None

6.51 0658 Key Board Assy (Without NFC) FRU

6.51.1 General Information

Figure6–141

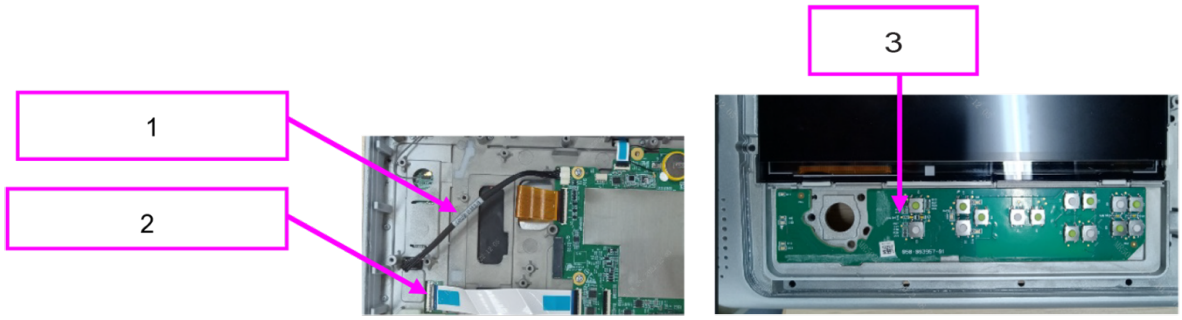
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-098828-00	0658 Key Board Assy (Without NFC) FRU	049-002628-00	0658 Silicon Key

6.51.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0658 Silicon Key (Silkscreen), see 0658 Silicon Key (Silkscreen) **6.30.2** Disassembly and Assembly.
4. Specific steps:

1) Disassemble the FFC connector of the keypad and the backup connector of the keypad, and then take out the keypad and replace it.

Figure6–142



1 Keypad Backup Connector
2 Keypad FFC Connector
3 Keypad Board

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

6.51.3 Commissioning and Verification

None

6.52 0658 Key Board Assy (with NFC) FRU

6.52.1 General Information

Figure6–143

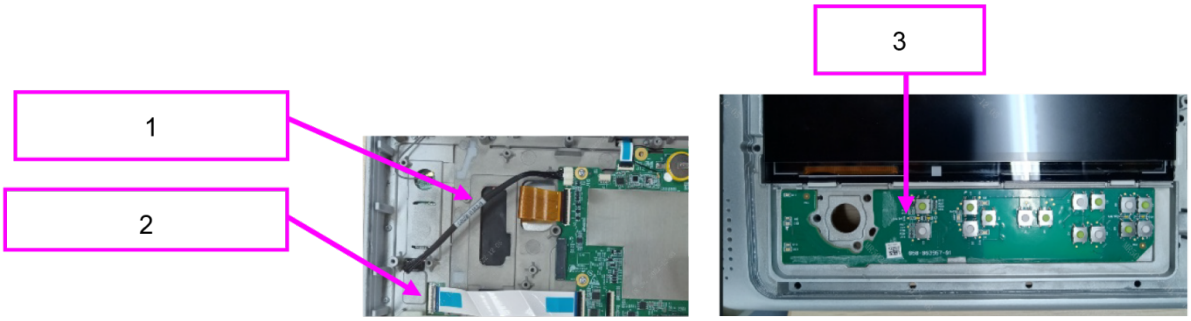
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-098826-00	0658 Key Board Assy (with NFC) FRU	049-002628-00	0658 Silicon Key

6.52.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0658 Silicon Key (Silkscreen), see 0658 Silicon Key (Silkscreen) **6.30.2** Disassembly and Assembly
4. Specific steps:

1) Disassemble the FFC connector of the keypad and the backup connector of the keypad, and then take out the keypad and replace it.

Figure6–144



1 Keypad Backup Connector

2 Keypad FFC Connector

3 Keypad Board

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

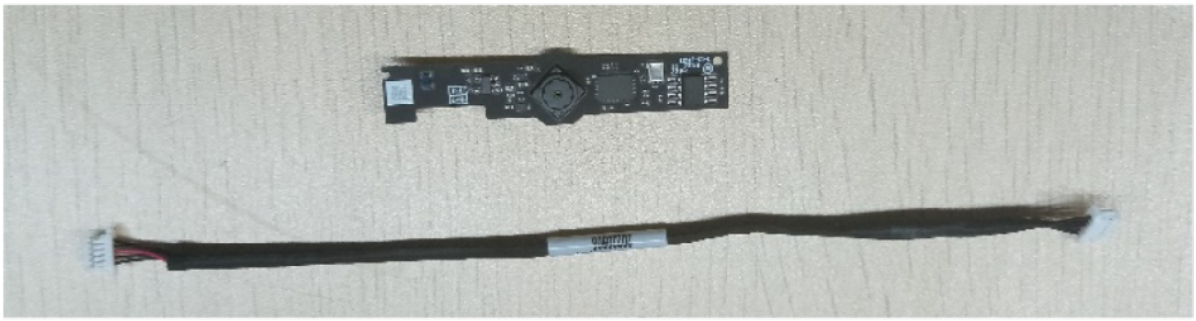
6.52.3 Commissioning and Verification

None

6.53 Camera Assembly FRU

6.53.1 General Information

Figure6–145



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094756-00	0659 Camera Assembly FRU	None	None

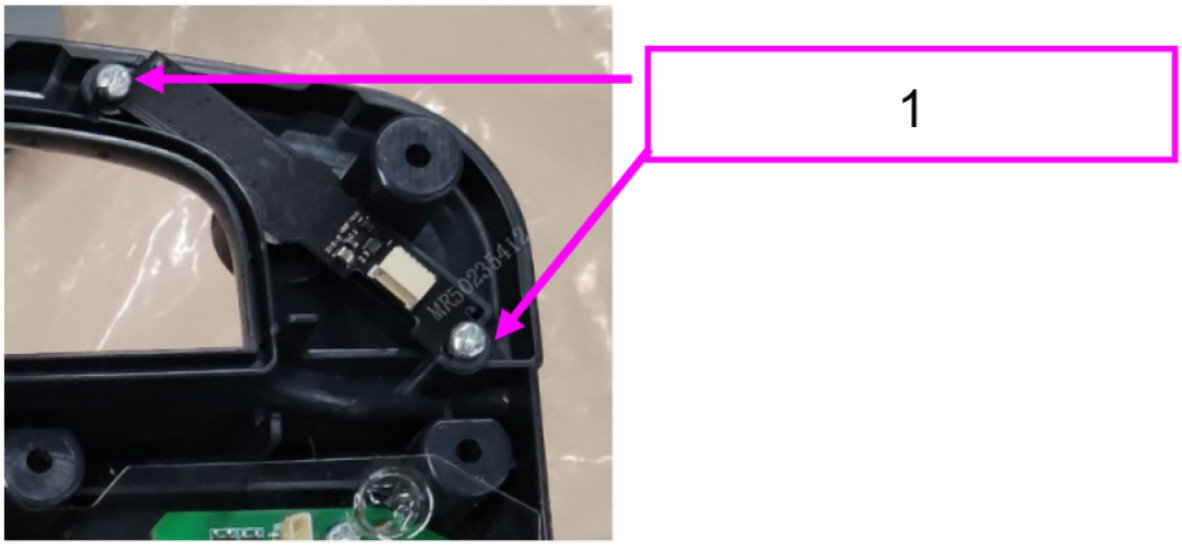
6.53.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.

2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:

1) Use a crosshead screwdriver to remove the two M3X6 screws with washers on the rear shell, and then remove the camera module.

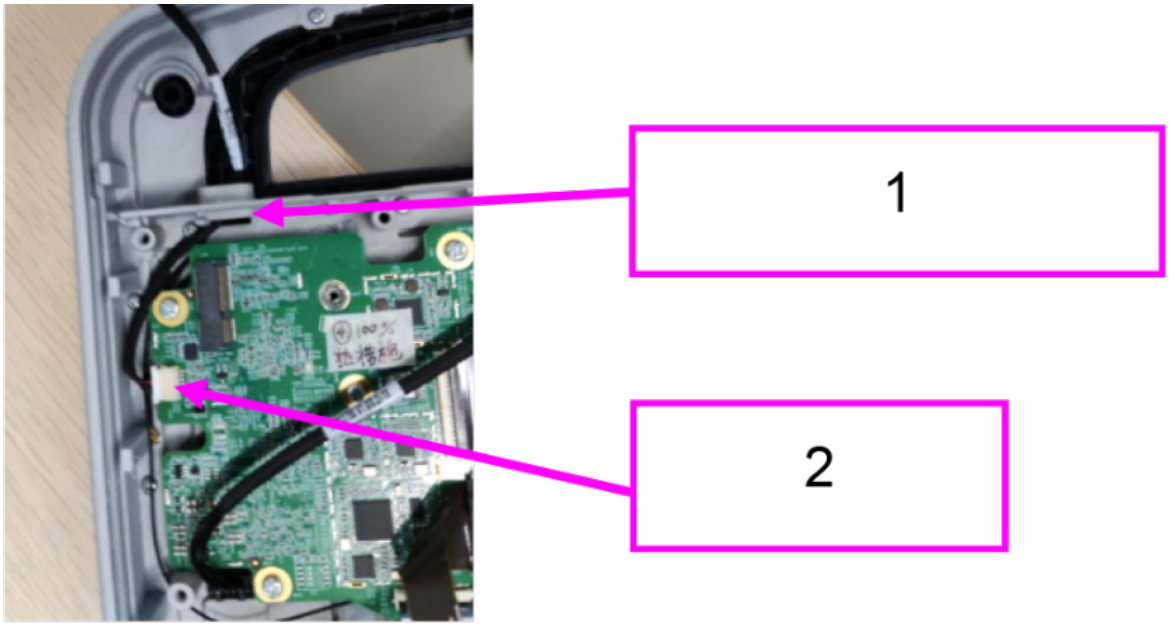
Figure6–146



1 Two M3X6 screws with washers

2) Pull out the camera cable from the board socket, and remove the cable from the front shell hole.

Figure6–147



1 Remove the cable from this hole
2 Camera Cable

4. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.53.3 Commissioning and Verification

None

6.54 Slave Board Assy FRU

6.54.1 General Information

Figure6–148

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090711-00	Slave Board Assy FRU	None	None

6.54.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.

3. For the disassembly of the slave board PCBA and cable connecting the slave board and the main control board FPC, see slave board PCBA and cable connecting the slave board and the main control board FPC **6.54.2** Disassembly and Assembly.
4. Remove and replace the slave board assembly.
5. Re-install the machine according to the disassembly steps after replacing the spare parts.

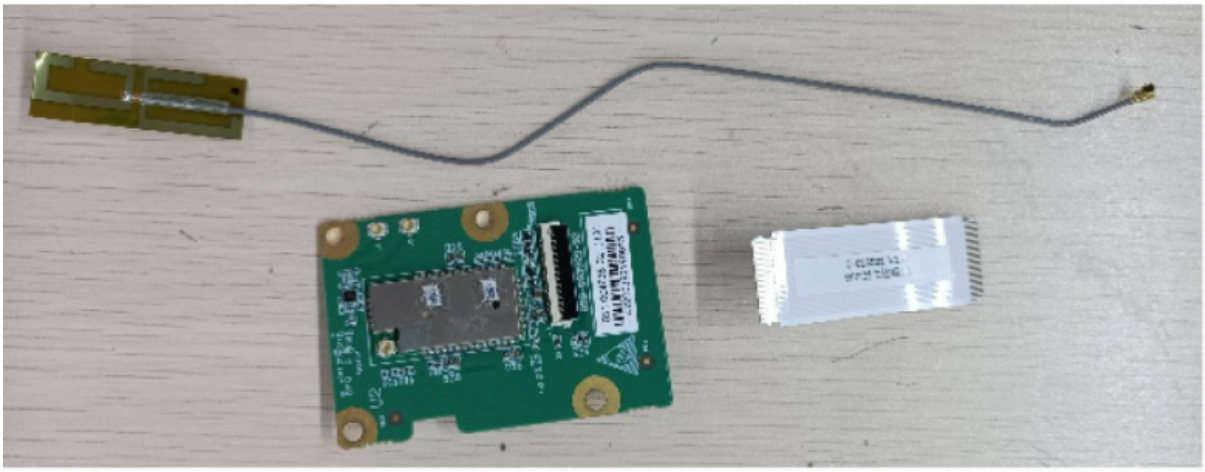
6.54.3 Commissioning and Verification

None

6.55 Wi-Fi Board Assy FRU

6.55.1 General Information

Figure6–149



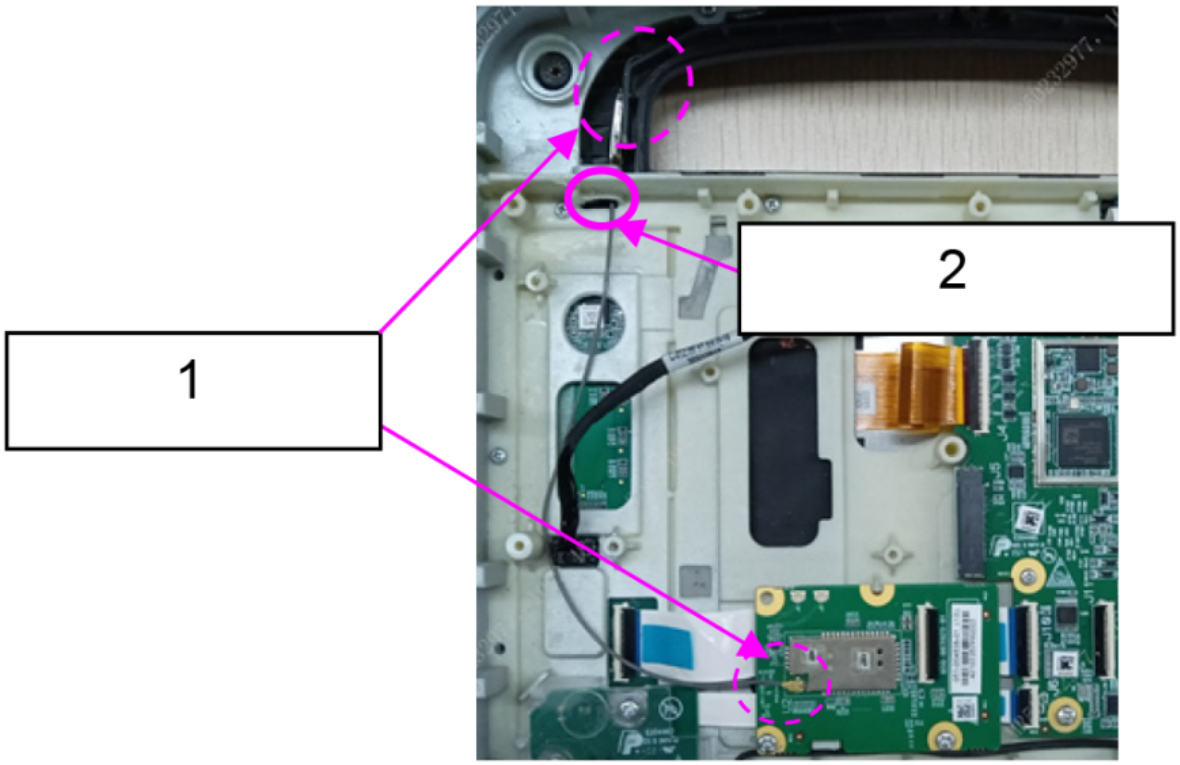
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090712-00	Wi-Fi Board Assy FRU	None	None

6.55.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. To disassemble the Wi-Fi board assembly and cable connecting the Wi-Fi board and the main control board FFC, see relevant sections.
4. Specific steps:

1) Remove the Wi-Fi antenna and replace the Wi-Fi board assembly.

Figure6–150



1 Remove the Wi-Fi antenna

2 Pull out the antenna from this hole

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

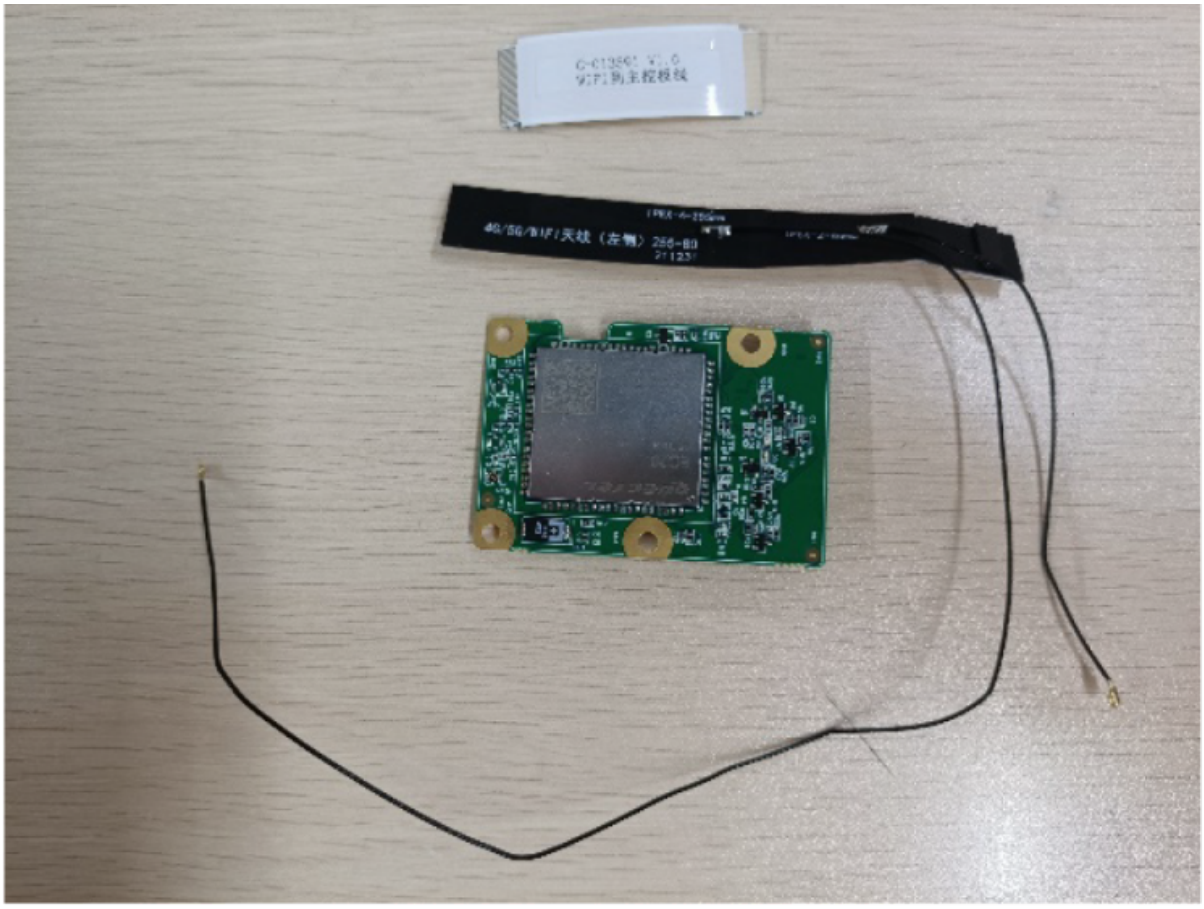
6.55.3 Commissioning and Verification

None

6.56 4G Board Assy (EU) FRU

6.56.1 General Information

Figure6–151



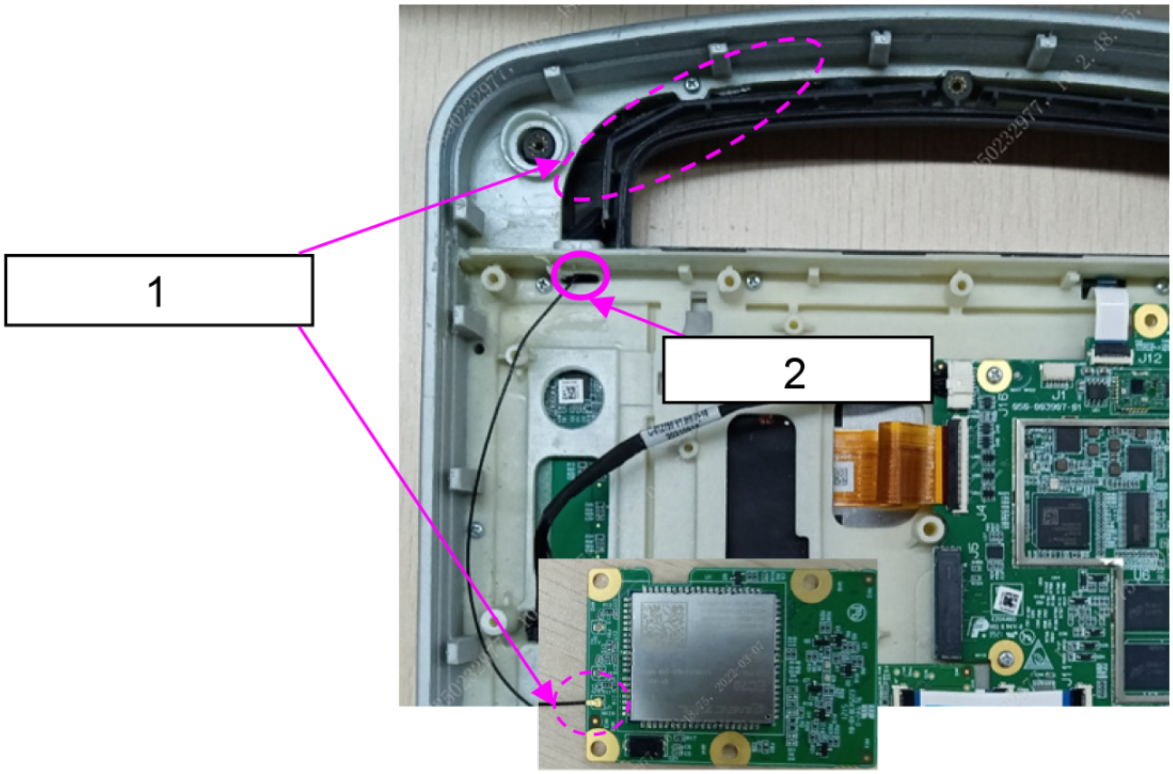
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090713-00	4G Board Assy (EU) FRU	None	None

6.56.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Disassemble the 4G board PCBA and cable connecting the Wi-Fi board and the main control board FFC.
4. Specific steps:

1) Remove the 4G/5G antenna (left)-255 antenna and then replace the 4G board assembly.

Figure6–152



1 Remove the 4G/5G antenna

2 Pull out the antenna from this hole

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

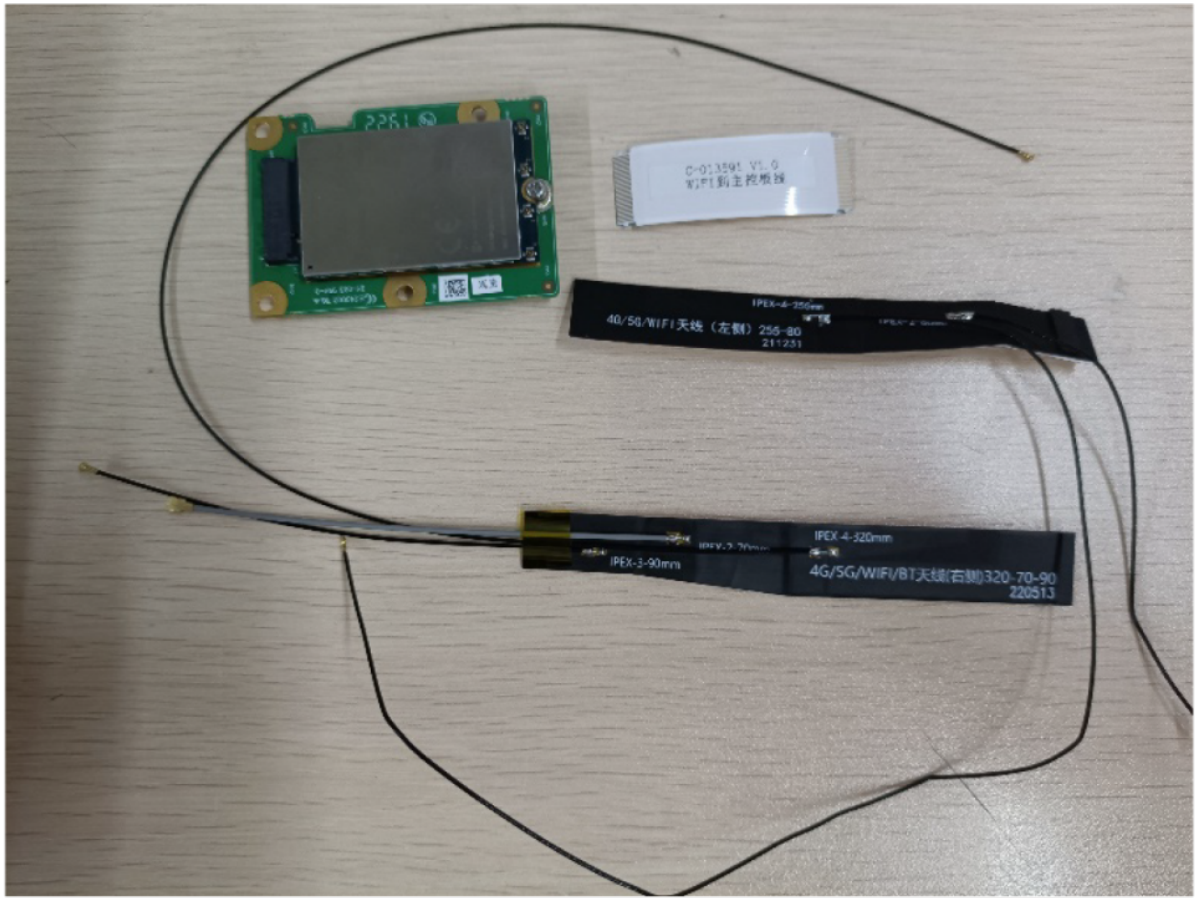
6.56.3 Commissioning and Verification

None

6.57 5G Board Assy FRU

6.57.1 General Information

Figure6–153



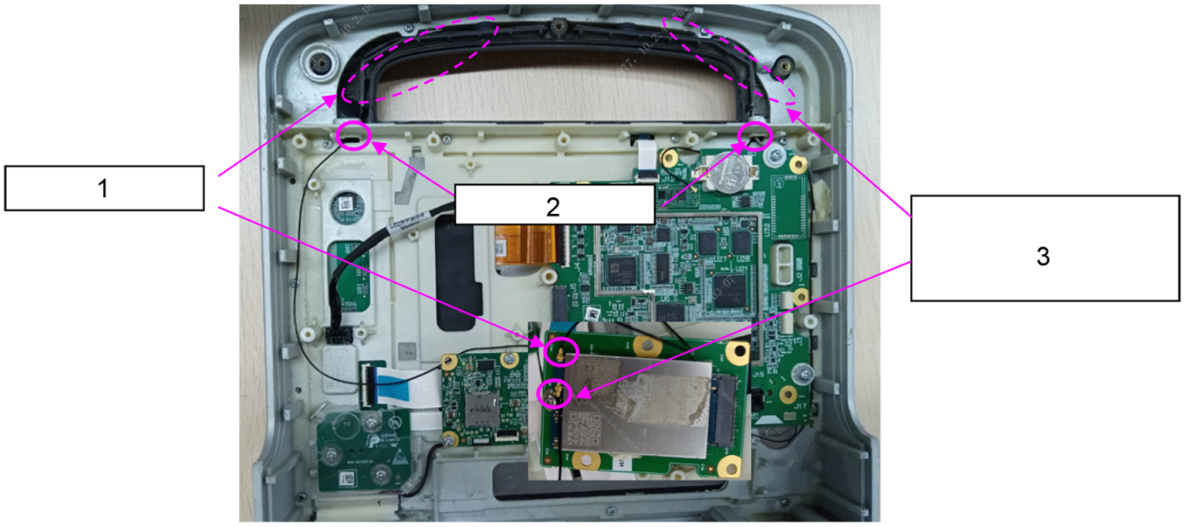
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-090714-00	5G Board Assy FRU	None	None

6.57.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Disassemble the 5G board PCBA and cable connecting the Wi-Fi board and the main control board FFC.
4. Specific steps:

1) Remove the 4G/5G antenna (left)-255 antenna and 4G/5G/Wi-Fi/BT antenna (right)-320-70-90 antenna, and then replace the 5G board assembly.

Figure6–154



1	Remove the 4G/5G antenna
2	Pull out the antenna from this hole
3	Remove the 4G/5G/Wi-Fi/BT antenna (right)

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

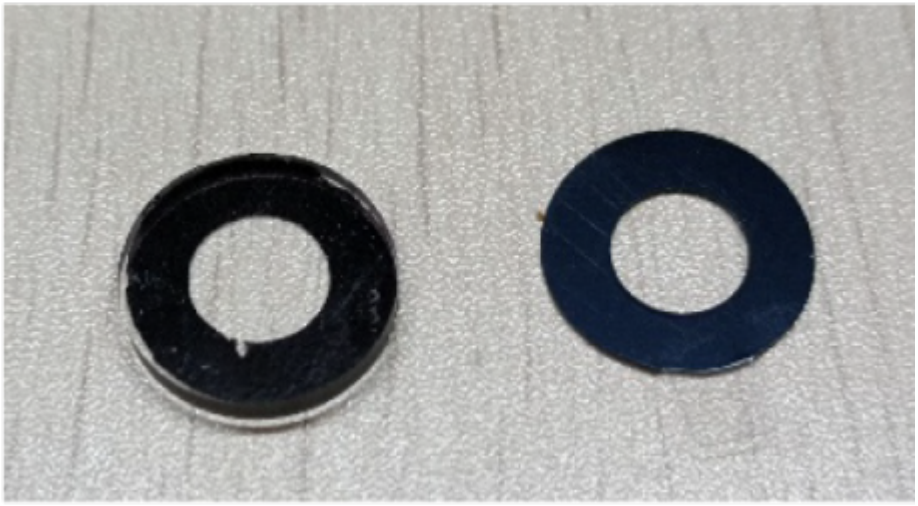
6.57.3 Commissioning and Verification

None

6.58 Camera lens FRU

6.58.1 General Information

Figure6–155



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-091837-00	Camera lens FRU	None	None

6.58.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:

1) Remove the camera lens, and replace it.

2) Note: When replacing the lens, attach the 047-041756-00 lens double-sided tape to the camera hole on the back cover of the handle, and tear off the adhesive release paper. Then, attach the camera lens. Ensure that the lens is free from fingerprints and dirt.

3) Re-install the machine according to the disassembly steps after replacing the spare parts.

Figure6–156

1 Remove the camera lens.

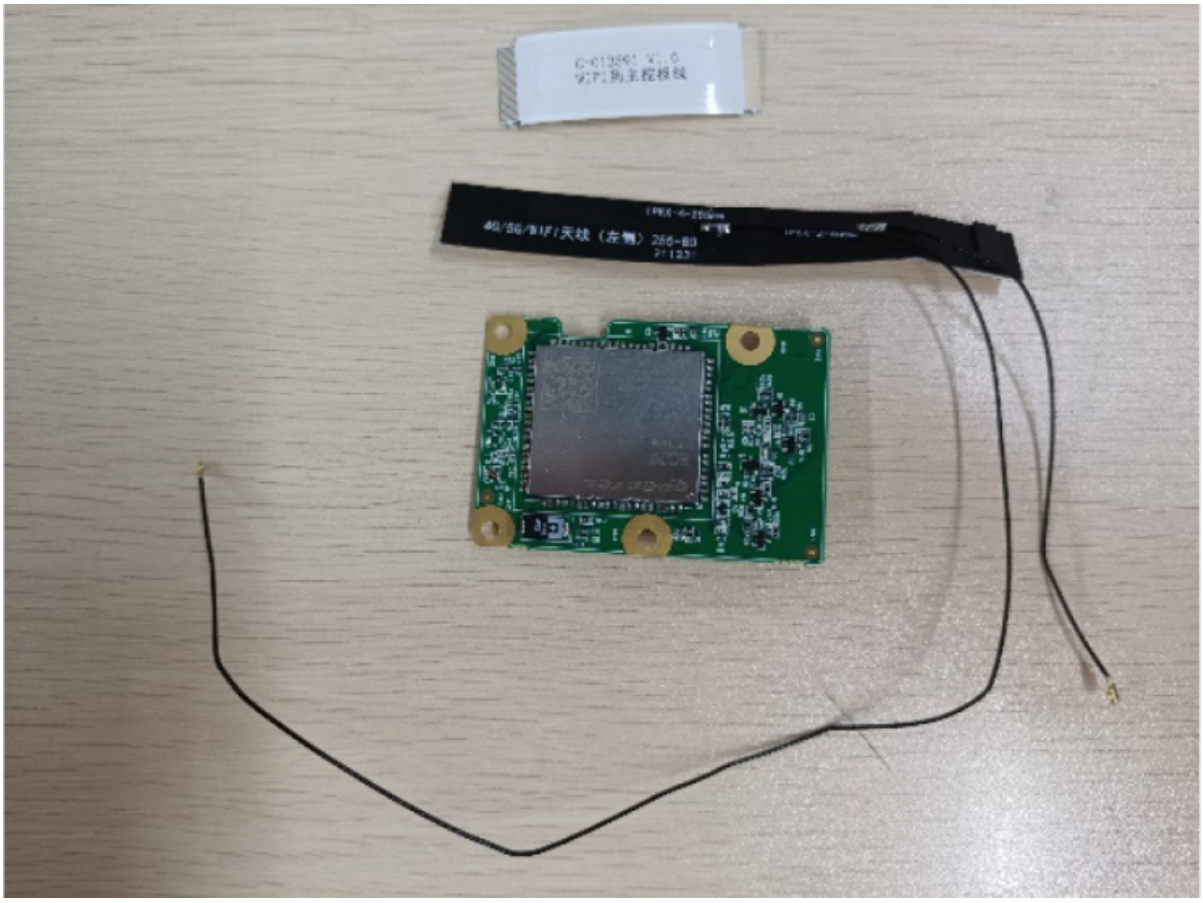
6.58.3 Commissioning and Verification

None

6.59 4G Board Assy (AU) FRU

6.59.1 General Information

Figure6–157



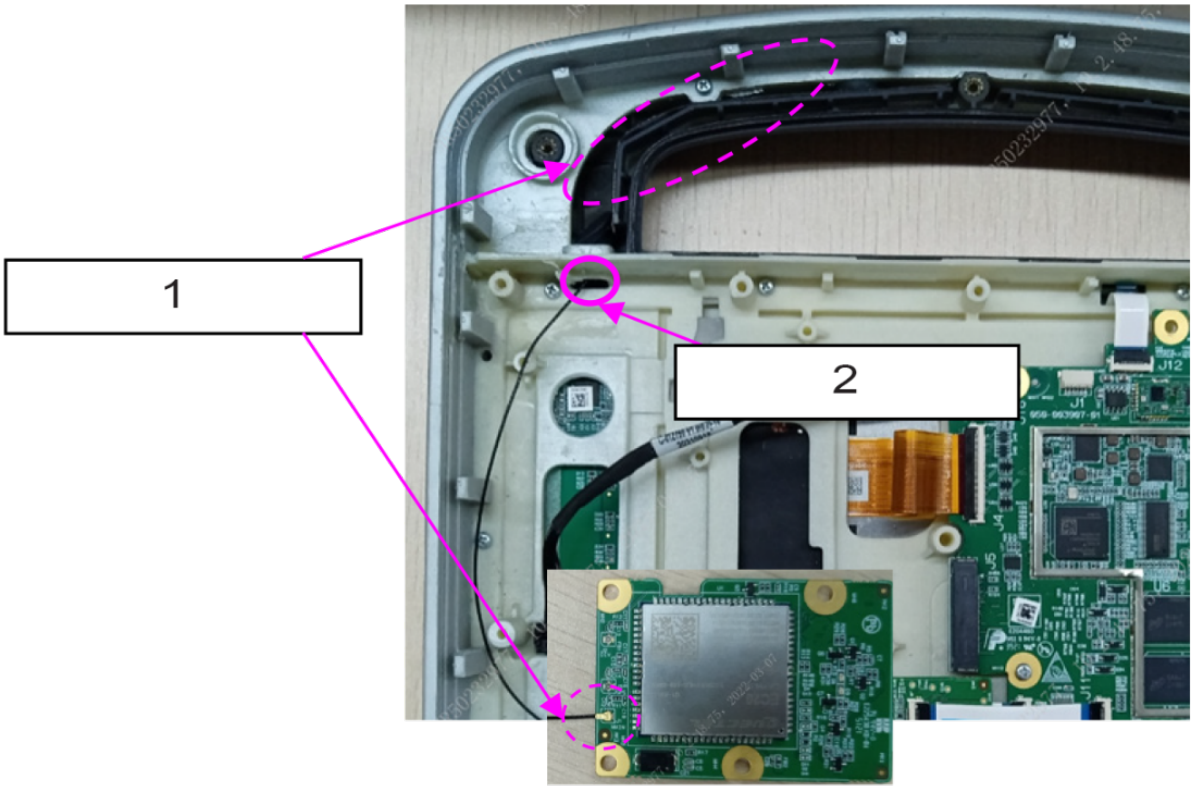
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094108-00	4G Board Assy (AU) FRU	None	None

6.59.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Disassemble the 4G board PCBA and cable connecting the Wi-Fi board and the main control board FFC.
4. Specific steps:

1) Remove the 4G/5G antenna (left)-255 antenna and then replace the 4G board assembly.

Figure6–158



1 Remove the 4G/5G antenna

2 Pull out the antenna from this hole

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

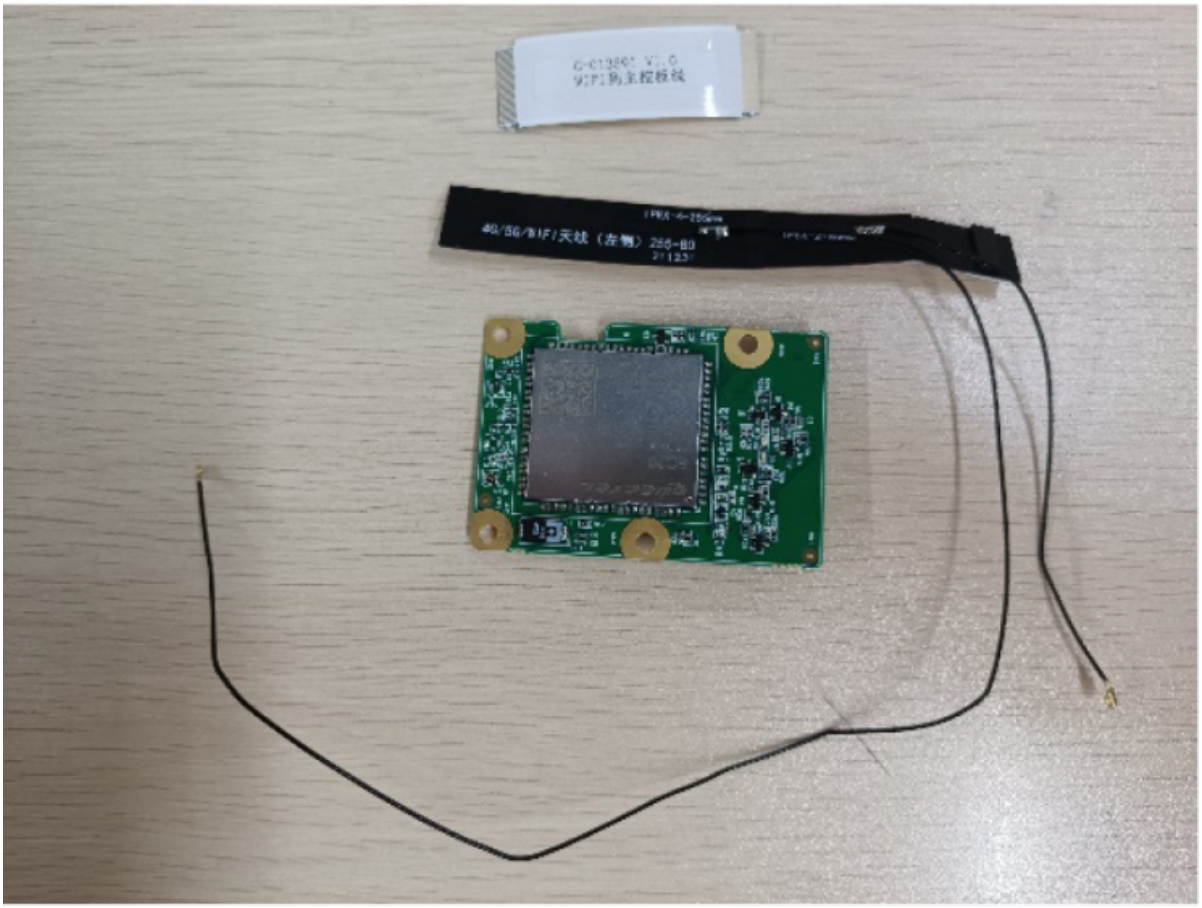
6.59.3 Commissioning and Verification

None

6.60 4G Board Assy (CN) FRU

6.60.1 General Information

Figure6–159



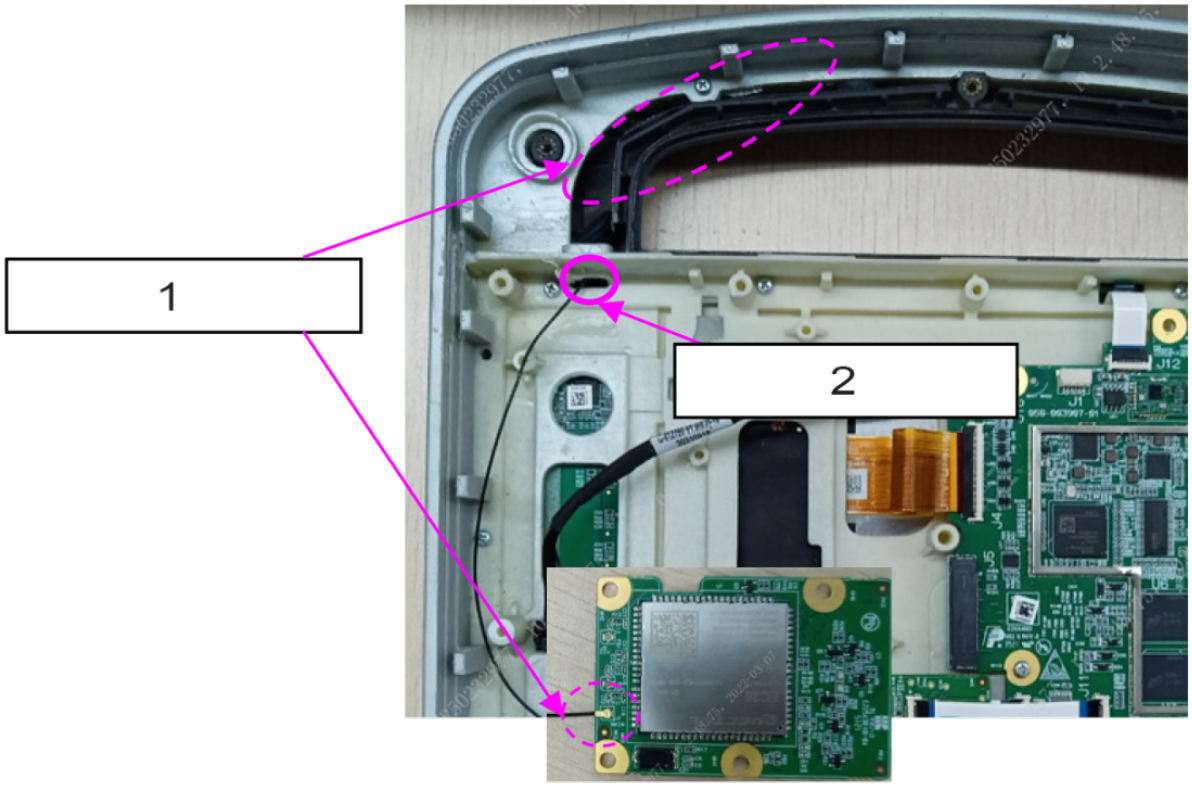
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094110-00	4G Board Assy (CN) FRU	None	None

6.60.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Disassemble the 4G board PCBA and cable connecting the Wi-Fi board and the main control board FFC.
4. Specific steps:

1) Remove the 4G/5G antenna (left)-255 antenna and then replace the 4G board assembly.

Figure6–160



1 Remove the 4G/5G antenna

2 Pull out the antenna from this hole

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

6.60.3 Commissioning and Verification

None

6.61 N1 Module Rack (Paddle and Portable Kit)

6.61.1 General Information

Figure6–161

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094318-00	N1 Module Rack (Paddle and Portable Kit)	None	None

6.61.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Press the unlock button on the main unit and remove the N1 Module Rack (Paddle and Portable Kit).

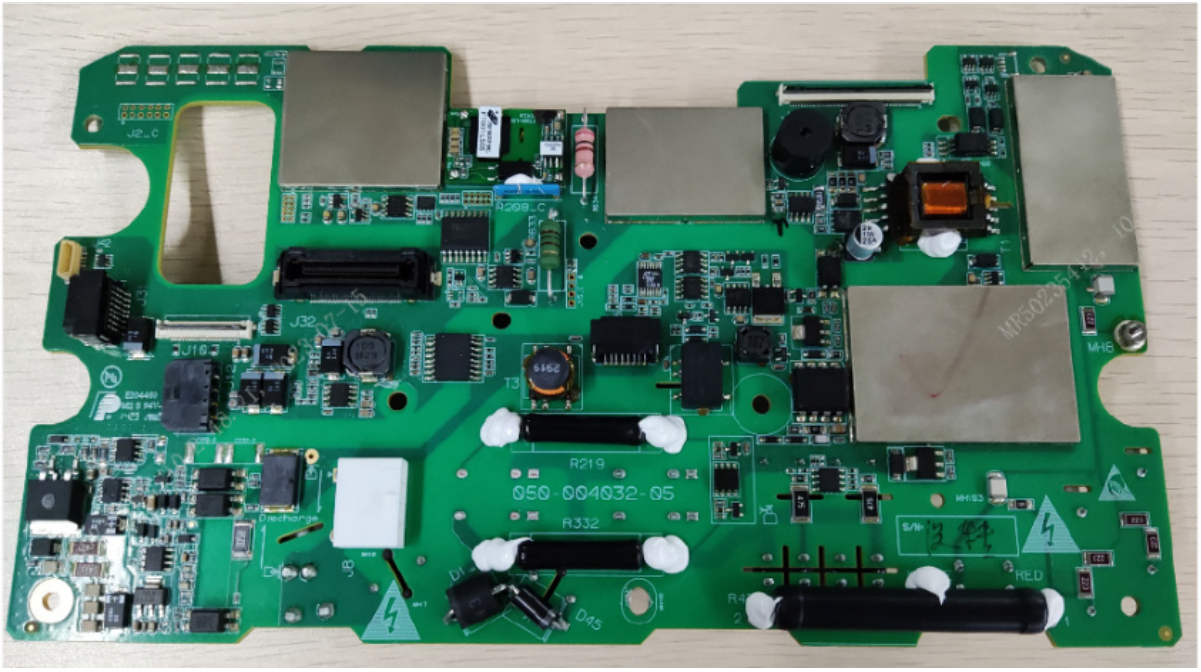
6.61.3 Commissioning and Verification

None

6.62 Integrated Board Assembly of DX Rear Cover FRU (Standard Con

6.62.1 General Information

Figure6–162



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094603-00	Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)	None	None

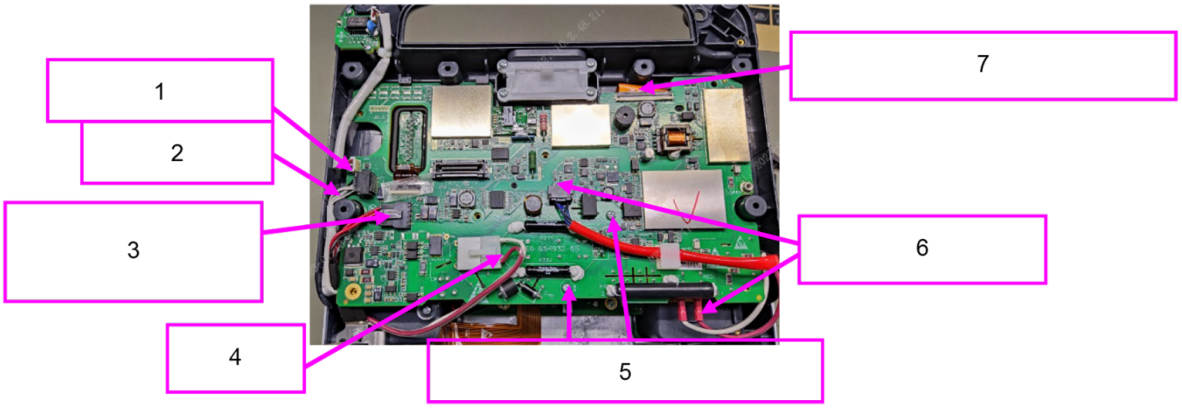
6.62.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of DX Integrated Therapy Board Insulation Sheet Assembly FRU, see DX Integrated Therapy Board Insulation Sheet Assembly FRU **6.62.2** Disassembly and Assembly.
4. Specific steps:

1) Use a crosshead screwdriver to remove two M3X8 cross recessed pan head screws that secure the integrated board, and remove the magnetic terminal cable, network interface cable, recorder cable, DC input cable of defibrillator DX power parameter board, capacitor cable,

internal cable of defibrillation port and DX power conversion to integrated therapy board, unplug the terminals from the integrated board, and remove the integrated board.

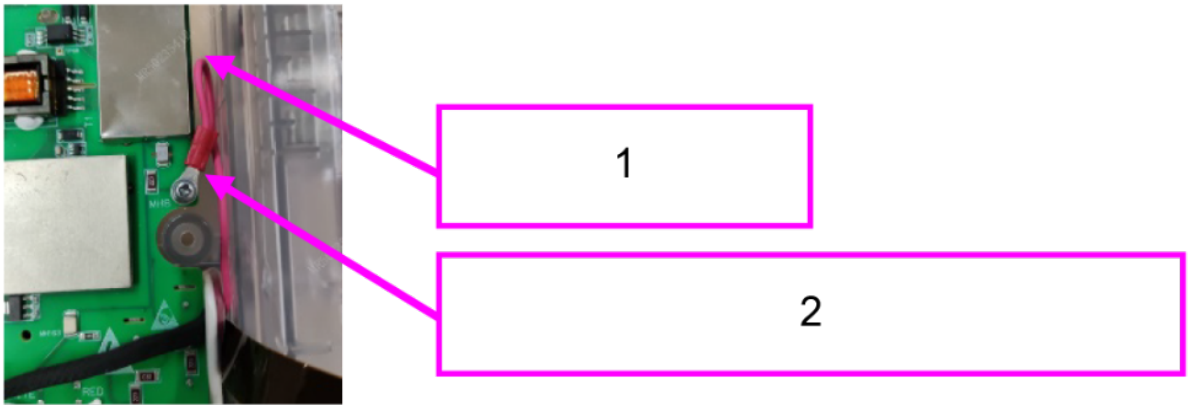
Figure6–163



1	Network Interface Cable
2	Recorder Cable
3	DC Input Cable of Defibrillator DX Power Parameter Board
4	Capacitor Cable
5	Two M3X8 cross recessed pan head screws
6	Internal cable of defibrillation port
7	DX Power Conversion to Therapy Board

2) If the paddle host is configured, use a crosshead screwdriver to remove one M3X6 crosshead pan head combination screw that fixes the in-position detection cable.

Figure6–164



1	In-position Detection Cable
2	One M3X6 crosshead pan head combination screw

3) Re-install the machine according to the disassembly steps after replacing the spare parts.

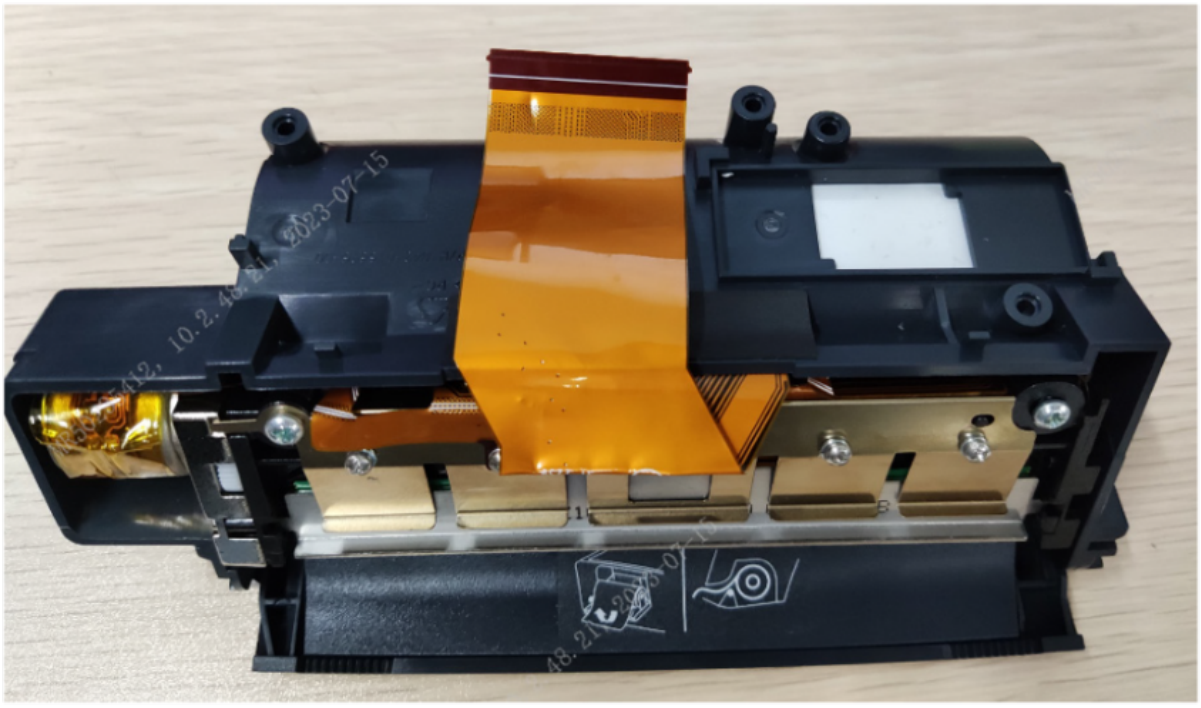
6.62.3 Commissioning and Verification

None

6.63 0659 Recorder Component FRU

6.63.1 General Information

Figure6–165



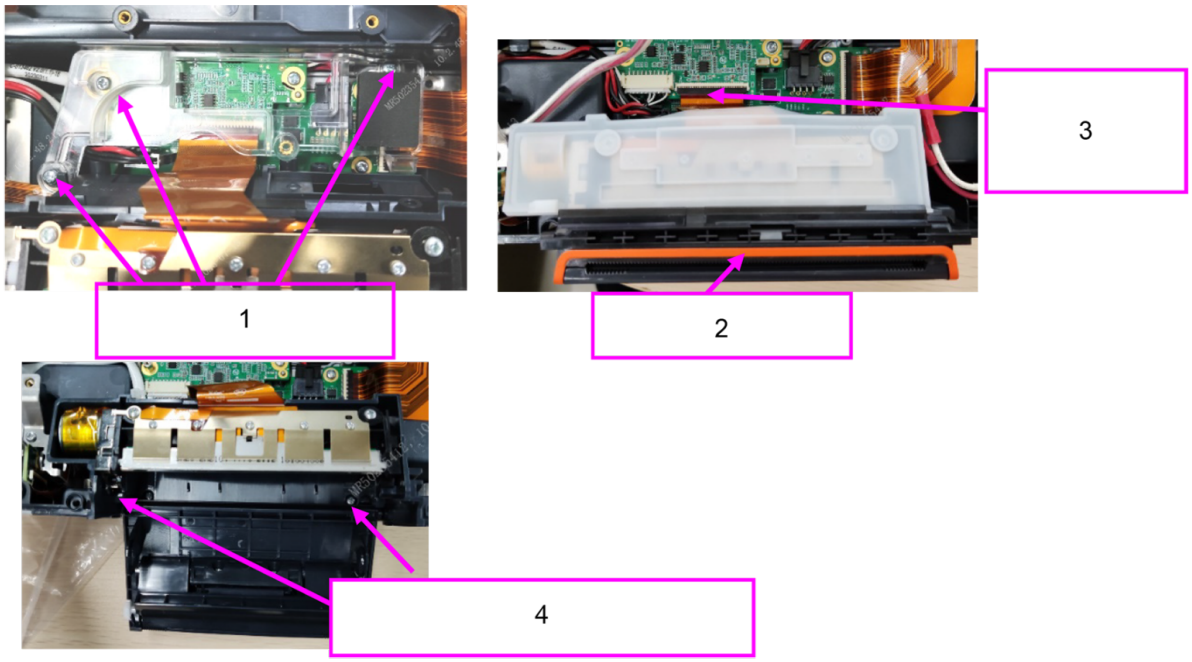
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094604-00	0659 Recorder Component FRU	024-001345-00	Thermal Print Head

6.63.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of DX Integrated Therapy Board Insulation Sheet Assembly FRU, see DX Integrated Therapy Board Insulation Sheet Assembly FRU **6.62.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove the three M3X6 cross recessed pan head screws that fix the capacitor bracket, and remove the pin of the recorder. Pull out the recorder FPC from the

board. Open the door of the recorder, and use a crosshead screwdriver to remove the two M3X8 cross recessed pan head screws that fix the recorder assembly.

Figure6–166



1	Three M3X6 cross recessed pan head screws
2	Removing the recorder pin
3	Pulling out the recorder FPC from the board
4	Two M3X8 cross recessed pan head screws

6.63.3 Commissioning and Verification

None

6.64 USB 3.0 Type-C Interface Board Assembly (Paddle) FRU

6.64.1 General Information

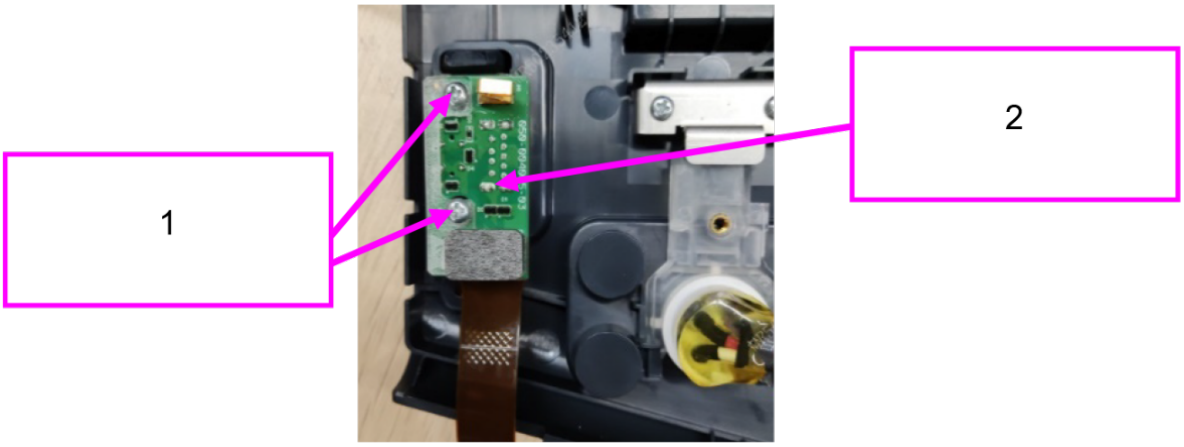
Figure6–167

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094605-00	USB 3.0 Type-C Interface Board Assembly (Paddle) FRU	None	None

6.64.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two PT3X8 cross recessed pan head self-tapping screws that secure the Type-C interface board, and then remove the board.

Figure6–168



1	Two PT3X8 cross recessed pan head self-tapping screws
2	Type-C interface board assembly

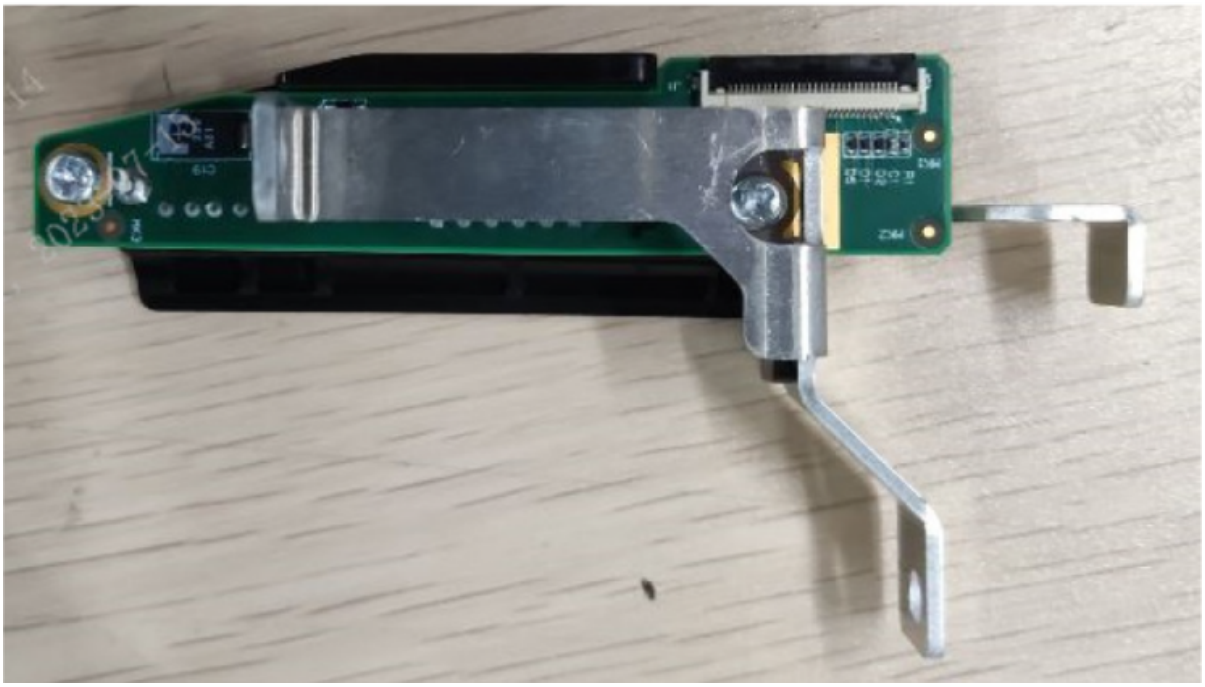
6.64.3 Commissioning and Verification

None

6.65 0659 IO Interface Assembly (Pad) FRU

6.65.1 General Information

Figure6–169

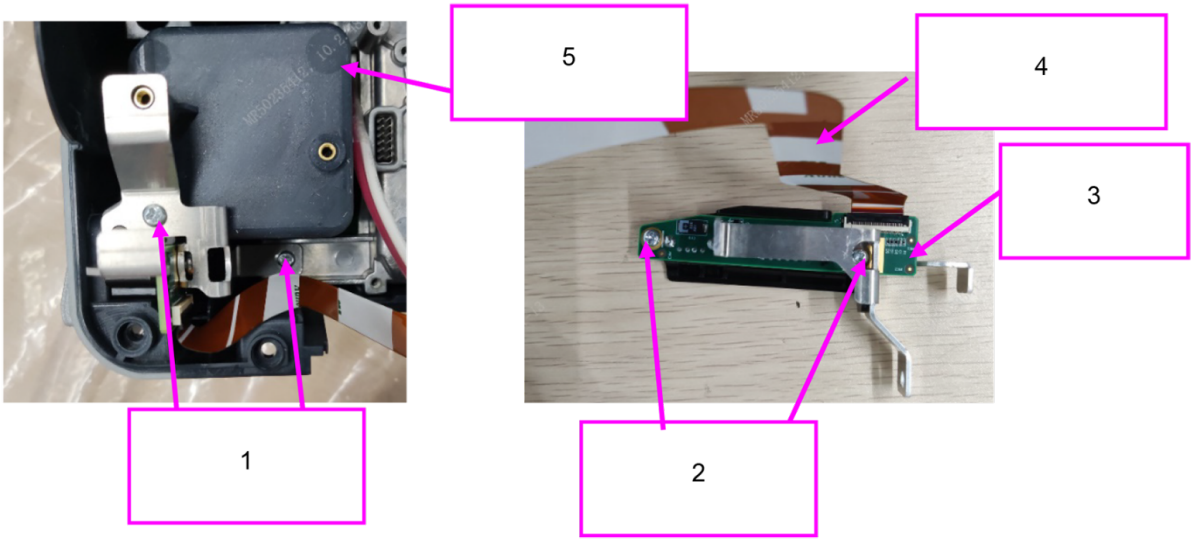


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094606-00	0659 I/O Interface Assembly (Pad) FRU	051-004746-00	IO Interface Board of DX Host

6.65.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 DX Power Adapter Board, see the 0659 DX Power Adapter Board **6.45.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the I/O interface assembly, and then remove the I/O interface assembly. Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the I/O interface assembly, and then remove the I/O interface sheet metal bracket. Remove the cable connecting the external interface board and battery connect board FPC.

Figure6–170



1	Two M3X6 cross recessed pan head screws
2	Two M3X6 cross recessed pan head screws
3	DX External Interface Board PCBA
4	Cable connecting the external interface board and battery connect board FPC
5	DX Power Conversion to Therapy Board

6.65.3 Commissioning and Verification

None

6.66 USB 3.0 Type-C Interface Board Assembly (Pad) FRU

6.66.1 General Information

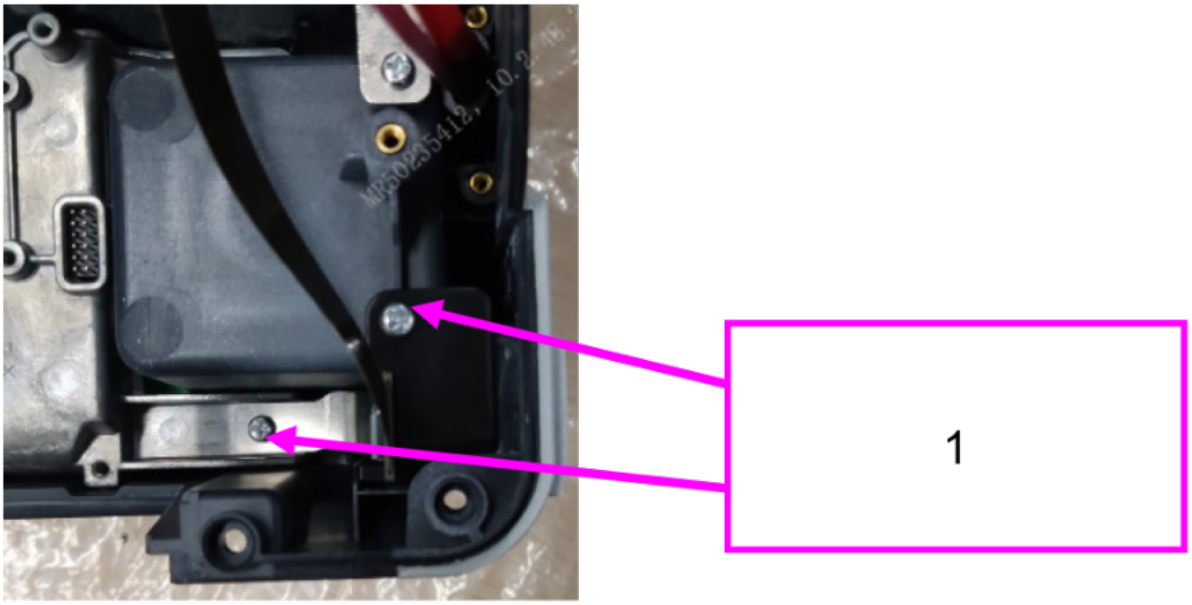
Figure6–171

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094607-00	USB 3.0 Type-C Interface Board Assembly (Pad) FRU	051-005092-00	0656 USB 3.0 Type-C Interface Board (DX)

6.66.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration), see Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) **6.62.2** Disassembly and Assembly.
4. Specific steps:
   Use a crosshead screwdriver to remove two M3X6 cross recessed pan head screws that secure the Type-C interface board assembly, and then remove the assembly from the rear shell.

Figure6–172



1 Two M3X6 cross recessed pan head screws

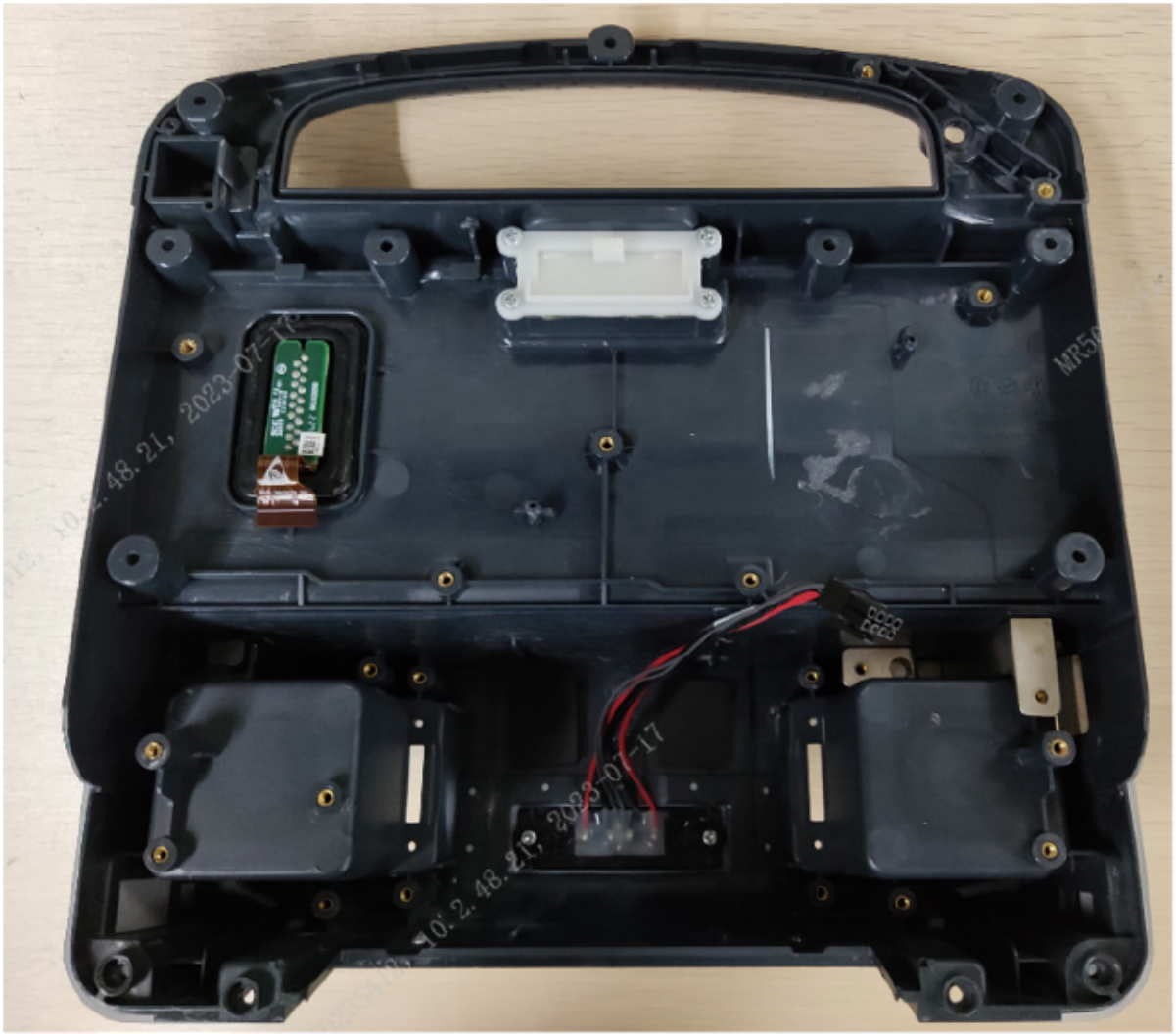
6.66.3 Commissioning and Verification

None

6.67 0659 Rear Cover Assembly (Pad) FRU

6.67.1 General Information

Figure6–173



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094609-00	0659 Rear Cover Assembly (Pad) FRU	None	None

6.67.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.

4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.
5. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.
7. For the disassembly of Internal Wire to Defibrillator DX Socket, see Internal Wire to Defibrillator DX Socket **6.10.2** Disassembly and Assembly.

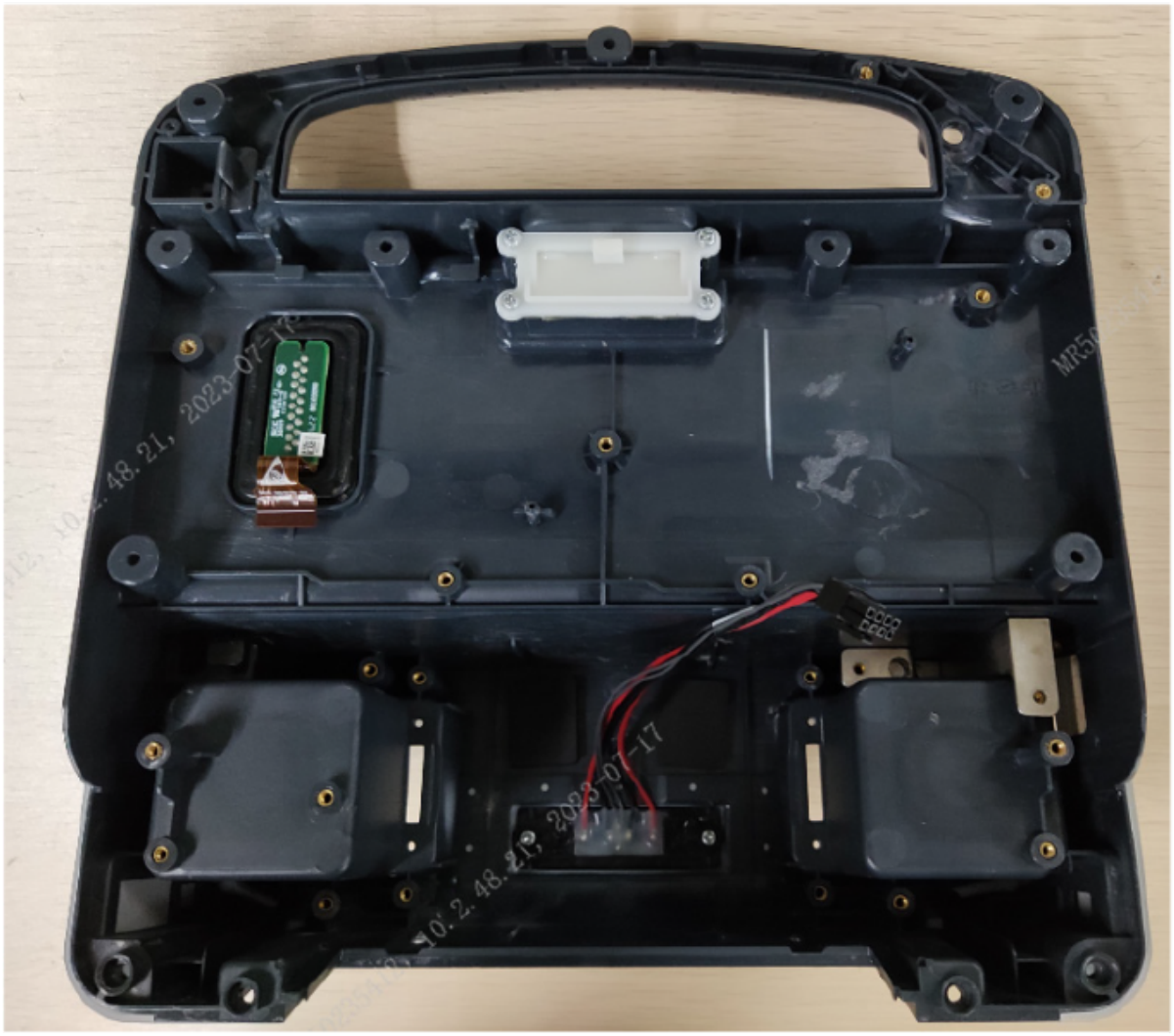
6.67.3 Commissioning and Verification

None

6.68 0659 Rear Cover Assembly (Pad Type-C) FRU

6.68.1 General Information

Figure6–174



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094610-00	0659 Rear Cover Assembly (Pad/Type-C) FRU	None	None

6.68.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.

3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.
4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.
5. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.
7. For the disassembly of Internal Wire to Defibrillator DX Socket, see Internal Wire to Defibrillator DX Socket **6.10.2** Disassembly and Assembly.

6.68.3 Commissioning and Verification

None

6.69 0659 Rear Cover Assembly (Paddle) FRU

6.69.1 General Information

Figure6–175

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094611-00	0659 Rear Cover Assembly (Paddle) FRU	None	None

6.69.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.
5. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.

6.69.3 Commissioning and Verification

None

6.70 0659 Rear Cover Assembly (Paddle Type-C) FRU

6.70.1 General Information

Figure6–176

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094613-00	0659 Rear Cover Assembly (Paddle/ Type-C) FRU	None	None

6.70.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.

5. For the disassembly of 0659 Right Electrode Base Assembly, see 0659 Right Electrode Base Assembly FRU **6.73.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.

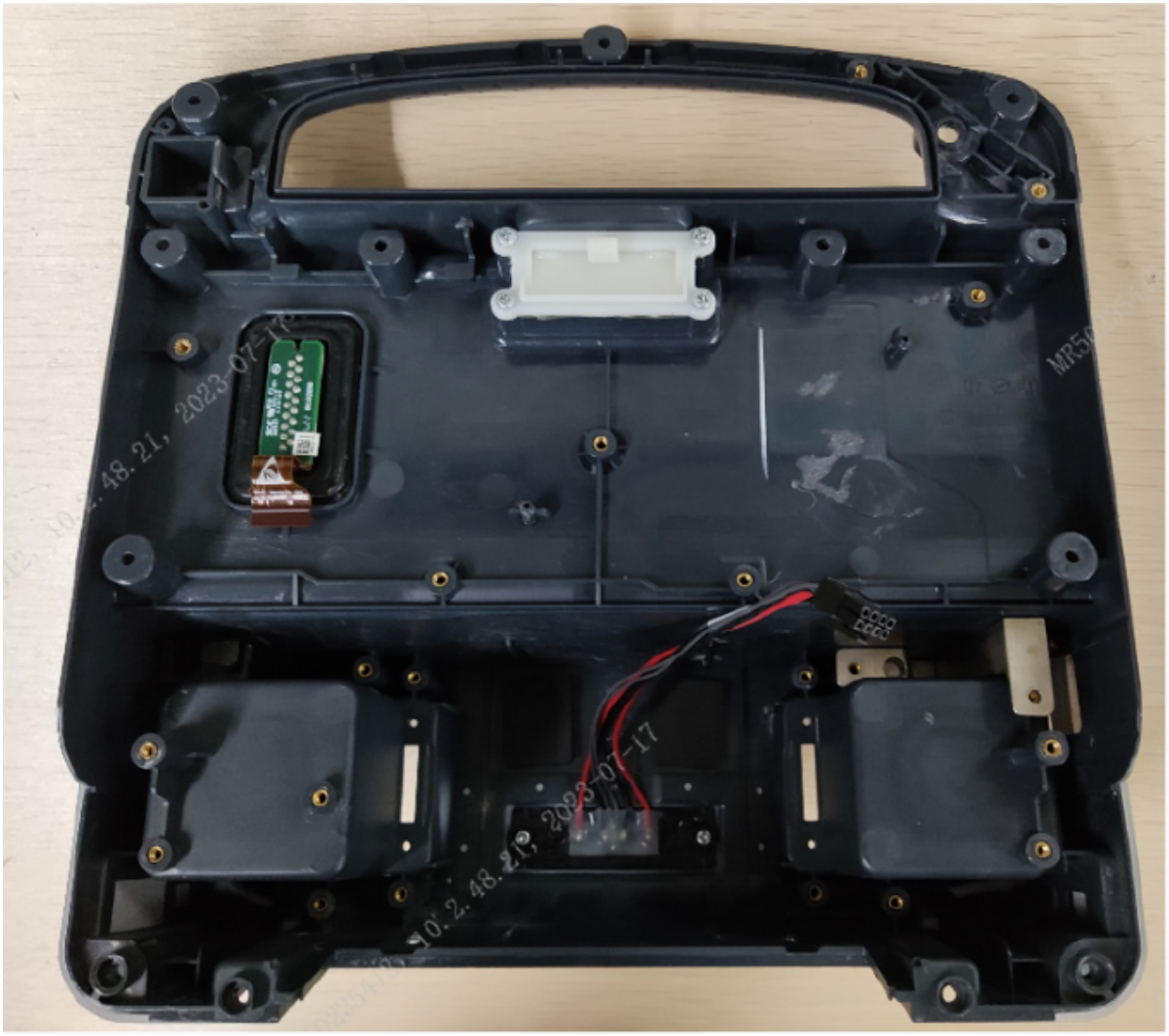
6.70.3 Commissioning and Verification

None

6.71 0659 Rear Cover Assembly (Paddle Type-C Camera) FRU

6.71.1 General Information

Figure6–177



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094748-00	0659 Rear Cover Assembly (Paddle/ Type-C/Camera) FRU	None	None

6.71.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.
4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.
5. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.
7. For the disassembly of Internal Wire to Defibrillator DX Socket, see Internal Wire to Defibrillator DX Socket **6.10.2** Disassembly and Assembly.

6.71.3 Commissioning and Verification

None

6.72 0659 Left Electrode Base Assembly FRU

6.72.1 General Information

Figure6–178

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094749-00	0659 Left Electrode Base Assembly FRU	051-004746-00	IO Interface Board of DX Host

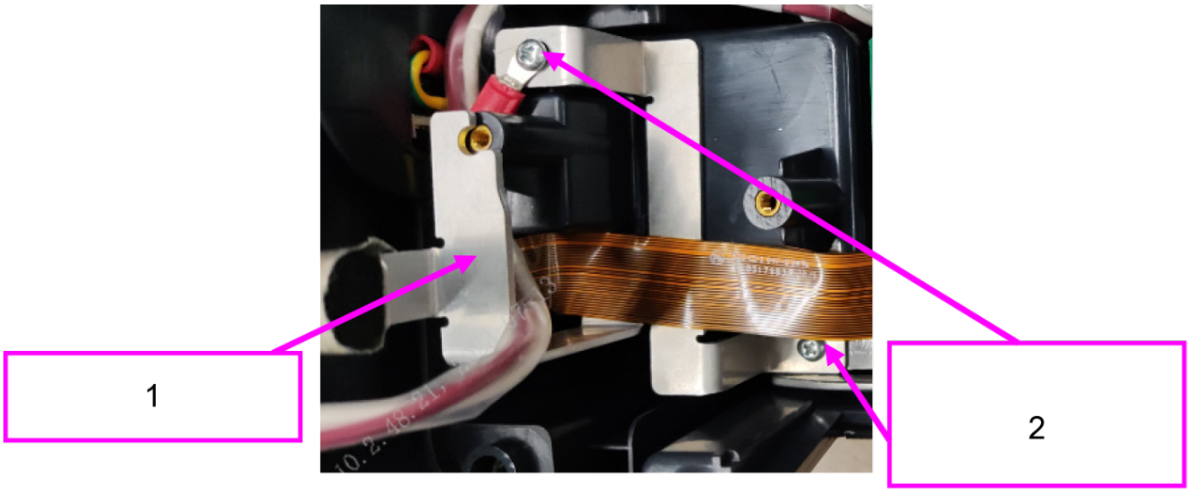
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
		043-019177-00	DX IO port plug (Extracorporal Board) 0659
		050-004819-00	Cable connecting the external interface board and battery connect board FPC
		009-014402-00	D60 Type-C Interface Board Grounding Cable

6.72.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 DX Power Adapter Board, see the 0659 DX Power Adapter Board **6.45.2** Disassembly and Assembly.
4. Specific steps:

1) Use a crosshead screwdriver to remove two PT3X8 crosshead pan head self-tapping screws that secure the I/O interface assembly, and then remove the I/O interface sheet metal.

Figure6–179

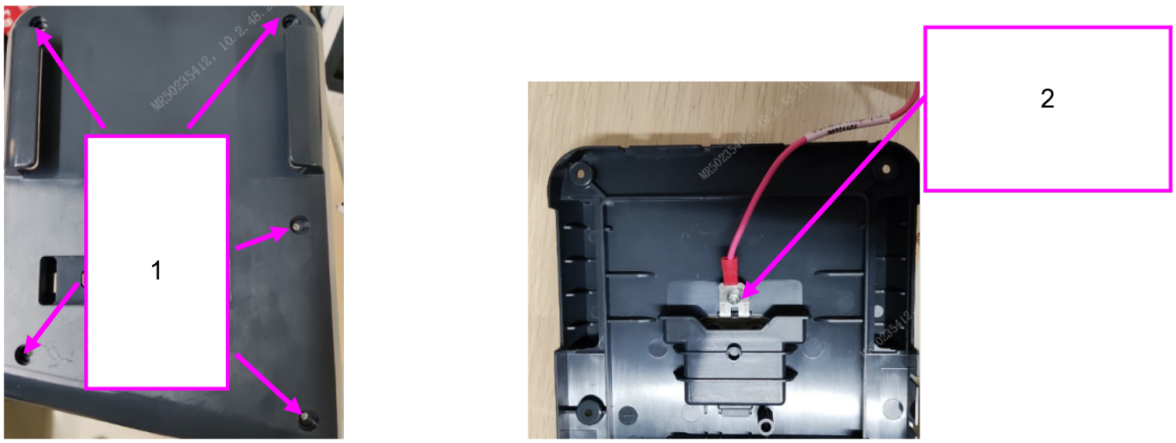


1 I/O interface sheet metal
2 Two PT3X8 cross recessed pan head self-tapping screws

2) Use tweezers to remove the rubber stoppers of the screws. Use a crosshead screwdriver to remove the five PT3X8 crosshead pan head self-tapping screws that secure the left electrode

base, and remove the left electrode base assembly from the rear shell of the main unit of the paddle. Use a crosshead screwdriver to remove one M3X6 cross pan head combination screw that secures the in-position detection cable, and separate the left electrode base from the rear shell.

Figure6–180



1	Five PT3X8 cross recessed pan head self-tapping screws
2	One M3X6 crosshead pan head combination screw

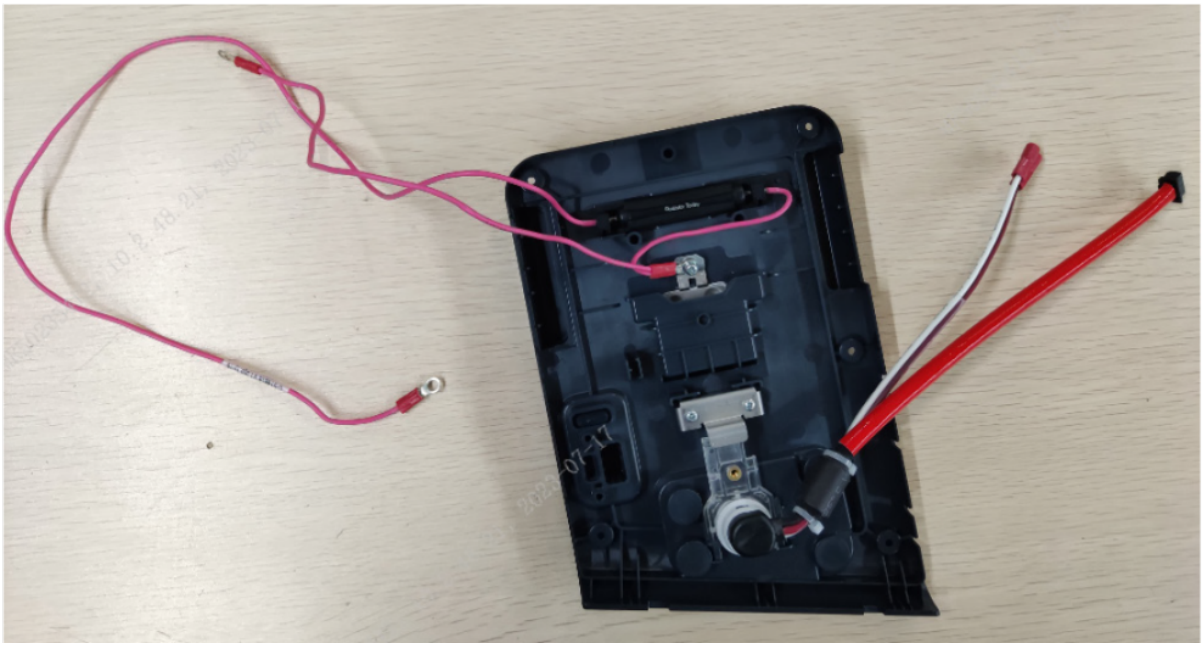
6.72.3 Commissioning and Verification

None

6.73 0659 Right Electrode Base Assembly FRU

6.73.1 General Information

Figure6–181



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094750-00	0659 Right Electrode Base Assembly FRU	043-019780-00	USB (Silicon Plug) (DX)
		009-014843-00	Internal Wire to Defibrillator DX Socket
		043-016145-00	Pin of Defibrillator (0658)
		009-014818-00	0656 DX Self-check Resistor Connector

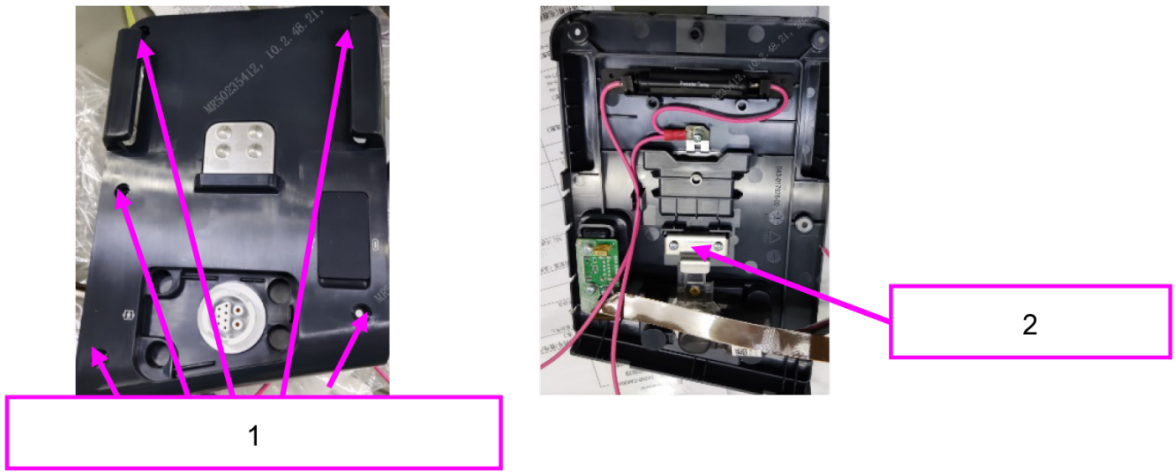
6.73.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Left Electrode Base Assembly FRU, see 0659 Left Electrode Base Assembly FRU **6.72.2** Disassembly and Assembly.
4. For the disassembly of 0656 Large Capacitance Cable, see 0656 Large Capacitance Cable **6.11.2** Disassembly and Assembly.

5. For the disassembly of DX Defibrillator Interface Cover (0659) FRU, see DX Defibrillator Interface Cover (0659) FRU **6.79.2** Disassembly and Assembly.
6. Specific steps:

1) Use tweezers to take out the rubber stopper on the right electrode base. Use a crosshead screwdriver to remove the five PT3X8 cross recessed pan head self-tapping screws that secure the right electrode base, and separate the right electrode base assembly from the rear shell.

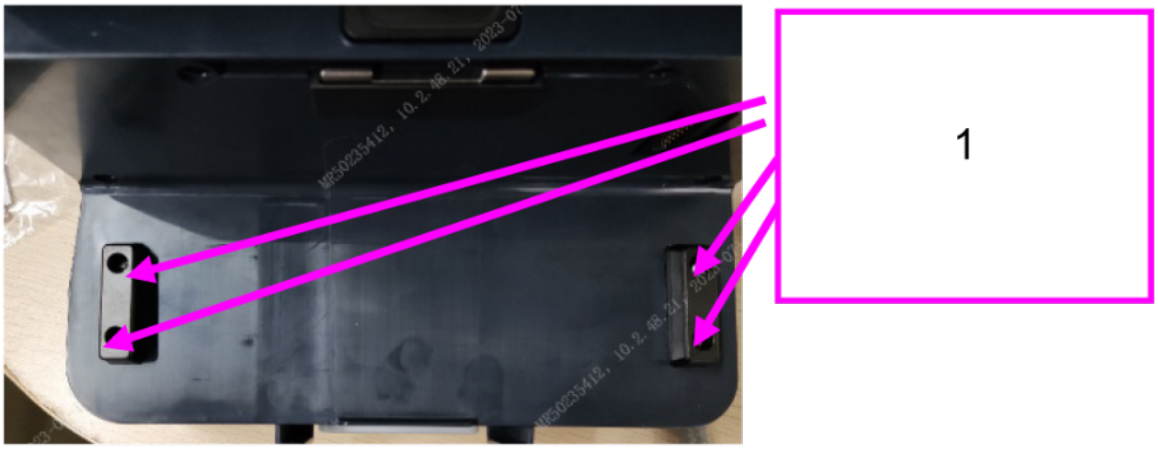
Figure6–182



1	Five PT3X8 cross recessed pan head self-tapping screws
2	Right Electrode Base Assembly

2) Use tweezers to remove the rubber stoppers of the N1 transfer box grounding block on the rear shell. Use a crosshead screwdriver to remove the four M3X12 cross recessed pan head screws with washers that secure the right electrode base of N1 transfer box grounding block. Remove the N1 transfer box grounding block from the rear shell.

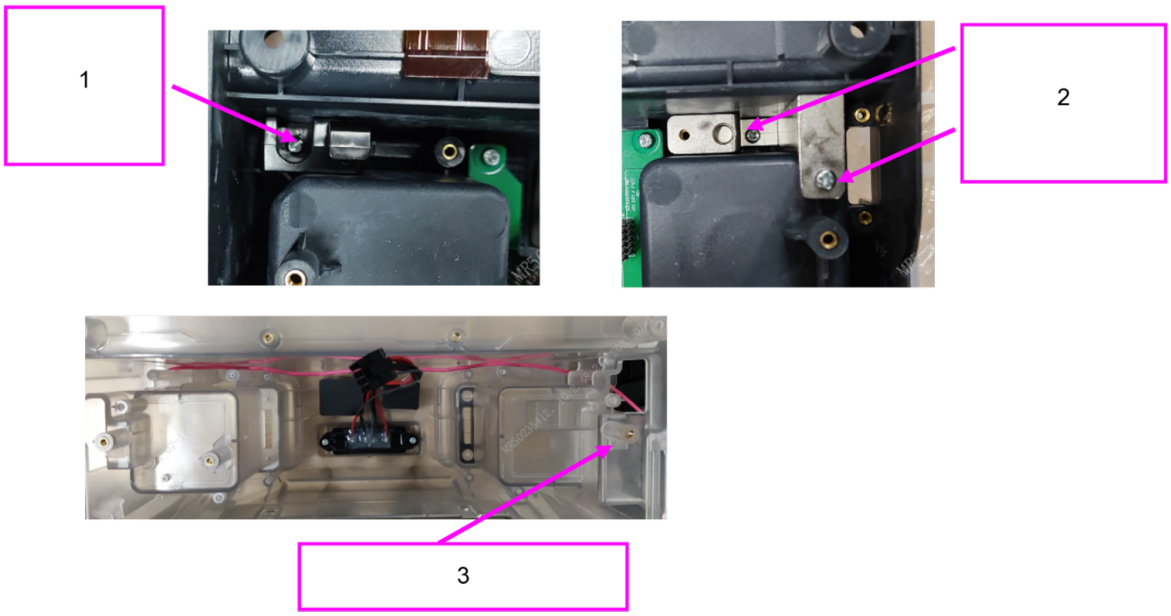
Figure6–183



1 Four M3X12 cross recessed pan head screws with washers

3) Use a crosshead screwdriver to remove three PT3X8 cross recessed pan head self-tapping screws that secure the positioning block of the DX rear shell and the paddle socket connection bracket. Remove the positioning block of the DX rear shell and the paddle socket connection bracket. Pull out the in-position detection cable from the rear shell.

Figure6–184



1 One PT3X8 cross recessed pan head self-tapping screw

2 Two PT3X8 cross recessed pan head self-tapping screws

3 Pulling out the cable from the right side of the rear shell

6.73.3 Commissioning and Verification

None

6.74 Left Adult Paddle Assembly (0655)

6.74.1 General Information

Figure6–185 XX picture

Table 6–1 Table Name (Required)

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
XXX	XXX	XXX	XXX

Describes the main functions of the FRU.

1. Function 1
2. Function 2
3. Function 3

6.74.2 Installation Method

Precautions

Tools Required

Text

Fixtures Required

Table 6–2 Table Name (Required)

Name	Code Number	Quantity
Crosshead screwdriver	/	1
Socket head wrench	/	1

Precondition

Table 6–3 Table Name (Required)

Name	Code Number	Quantity
X fixture	/	1
XX fixture	/	1

Specific Steps

1. Specify the position of the FRU on the whole machine (using a assembly and disassembly diagram or providing the link of the exploded view chapter).
2. Perform assembly and disassembly operations.

NOTE

Precautions

Further Requirements (Assembly, Commissioning, and Verification Shall Be Completed)

Text

6.74.3 Commissioning and Verification

Precautions

Text

Tools Required

Text

Tool Fixtures Required

Table 6–4 Table Name (Required)

Name	Code Number	Quantity
Crosshead screwdriver	/	1
Socket head wrench	/	1

Precondition

Table 6–5 Table Name (Required)

Name	Code Number	Quantity
X fixture	/	1
XX fixture	/	1

Specific Steps

1. Specify the position of the FRU on the whole machine (using a assembly and disassembly diagram or providing the link of the exploded view chapter).
2. Perform assembly and disassembly operations.

NOTE

Precautions

Further Requirements

6.75 Right Adult Paddle Assembly (0655)

6.75.1 General Information

Figure6–186 XX picture

Table 6–6 Table Name (Required)

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
XXX	XXX	XXX	XXX

Describes the main functions of the FRU.

1. Function 1
2. Function 2
3. Function 3

6.75.2 Installation Method

Precautions

Tools Required

Text

Fixtures Required

Table 6–7 Table Name (Required)

Name	Code Number	Quantity
Crosshead screwdriver	/	1
Socket head wrench	/	1

Precondition

Table 6–8 Table Name (Required)

Name	Code Number	Quantity
X fixture	/	1
XX fixture	/	1

Specific Steps

1. Specify the position of the FRU on the whole machine (using a assembly and disassembly diagram or providing the link of the exploded view chapter).

2. Perform assembly and disassembly operations.

NOTE

Precautions

Further Requirements (Assembly, Commissioning, and Verification Shall Be Completed)

Text

6.75.3 Commissioning and Verification

Precautions

Text

Tools Required

Text

Tool Fixtures Required

Table 6–9 Table Name (Required)

Name	Code Number	Quantity
Crosshead screwdriver	/	1
Socket head wrench	/	1

Precondition

Table 6–10 Table Name (Required)

Name	Code Number	Quantity
X fixture	/	1
XX fixture	/	1

Specific Steps

1. Specify the position of the FRU on the whole machine (using a assembly and disassembly diagram or providing the link of the exploded view chapter).

2. Perform assembly and disassembly operations.

NOTE

Precautions

Further Requirements

6.76 0659 Front Cover Assembly FRU

6.76.1 General Information

Figure6–187

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-094755-00	0659 Front Cover Assembly FRU	None	None

6.76.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Remove all assemblies from the front cover assembly according to the pre-disassembly steps, and replace the 0659 Front Cover Assembly FRU. See 0659 Front Cover Assembly FRU **6.76.2** Disassembly and Assembly.
4. Re-install the machine according to the disassembly steps after replacing the spare parts.

6.76.3 Commissioning and Verification

None

6.77 DX Integrated Therapy Board Insulation Sheet Assembly FRU

6.77.1 General Information

Figure6–188

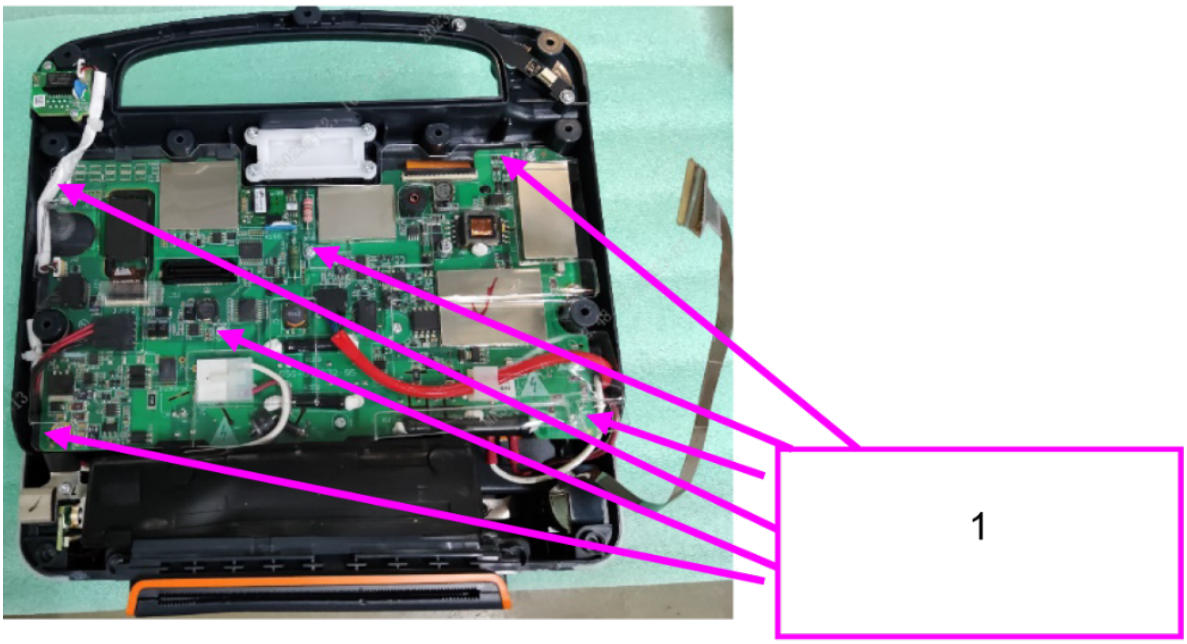
FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-096146-00	DX Integrated Therapy Board Insulation Sheet Assembly FRU	None	None

6.77.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. Specific steps:

1) Use a crosshead screwdriver to remove six M3X8 cross recessed pan head screws that secure the insulation sheet, and then remove the insulation sheet assembly.

Figure6–189



1 Six M3X8 cross recessed pan head screws

2) Re-install the machine according to the disassembly steps after replacing the spare parts.

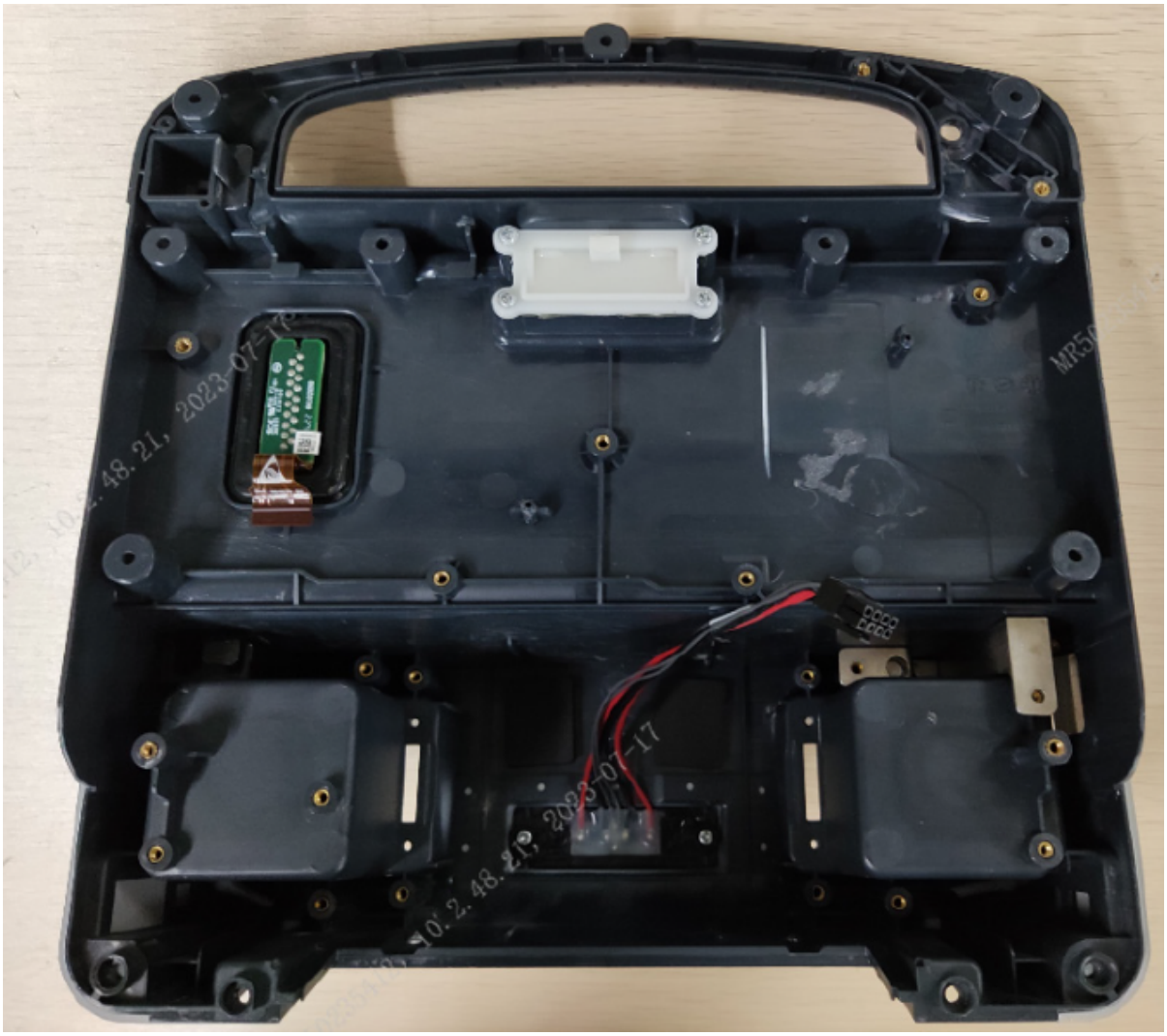
6.77.3 Commissioning and Verification

None

6.78 0659 Rear Cover Assembly (Pad Type-C Camera) FRU

6.78.1 General Information

Figure6–190



FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-096149-00	0659 Rear Cover Assembly (Pad/Type-C/Camera) FRU	None	None

6.78.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.

2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 I/O Interface Assembly (Pad) FRU, see 0659 I/O Interface Assembly (Pad) FRU **6.65.2** Disassembly and Assembly.
4. For the disassembly of 0659 DX Battery Backplate, see 0659 DX Battery Backplate **6.47.2** Disassembly and Assembly.
5. For the disassembly of USB 3.0 Type-C Interface Board Assembly (Pad) FRU, see USB 3.0 Type-C Interface Board Assembly (Pad) FRU **6.66.2** Disassembly and Assembly.
6. For the disassembly of 0656 DX Network Interface Board PCBA, see 0656 DX Network Interface Board PCBA **6.42.2** Disassembly and Assembly.
7. For the disassembly of Internal Wire to Defibrillator DX Socket, see Internal Wire to Defibrillator DX Socket **6.10.2** Disassembly and Assembly.

6.78.3 Commissioning and Verification

None

6.79 DX Defibrillator Interface Cover (0659) FRU

6.79.1 General Information

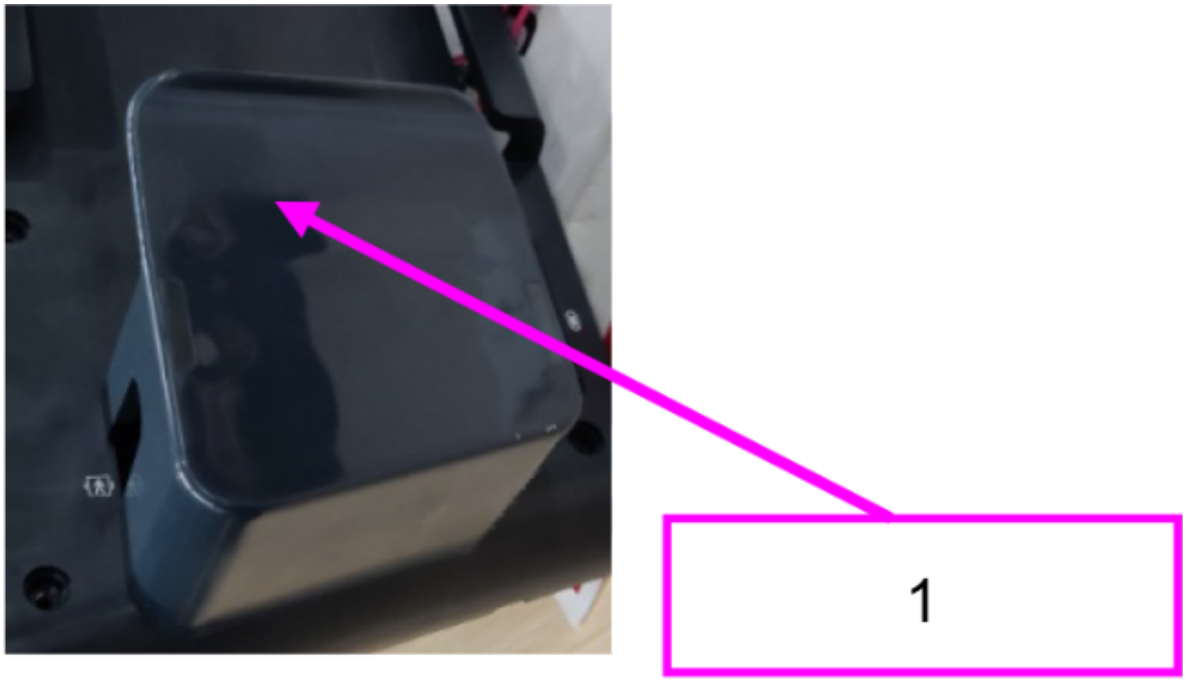
Figure6–191

FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-096638-00	DX Defibrillator Interface Cover (0659) FRU	None	None

6.79.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Remove the DX defibrillator interface cover from the right electrode base assembly.

Figure6–192



1 Defibrillator Interface Cover

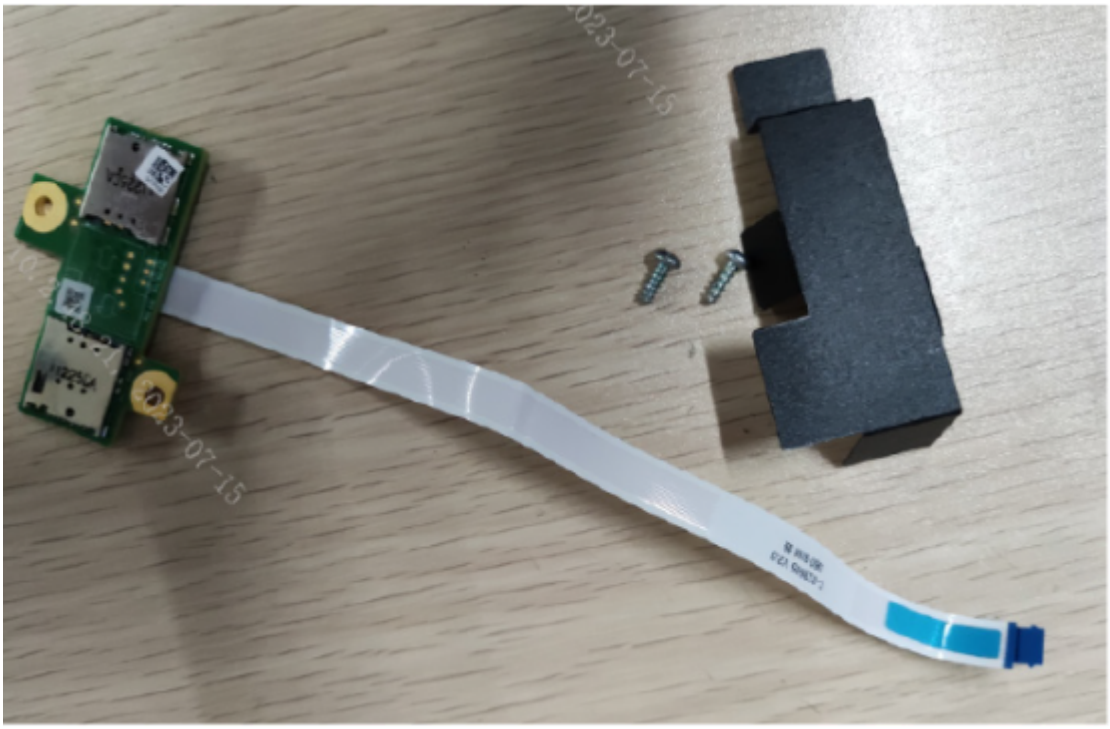
6.79.3 Commissioning and Verification

None

6.80 SIM Board Assembly (0659) FRU

6.80.1 General Information

Figure6–193

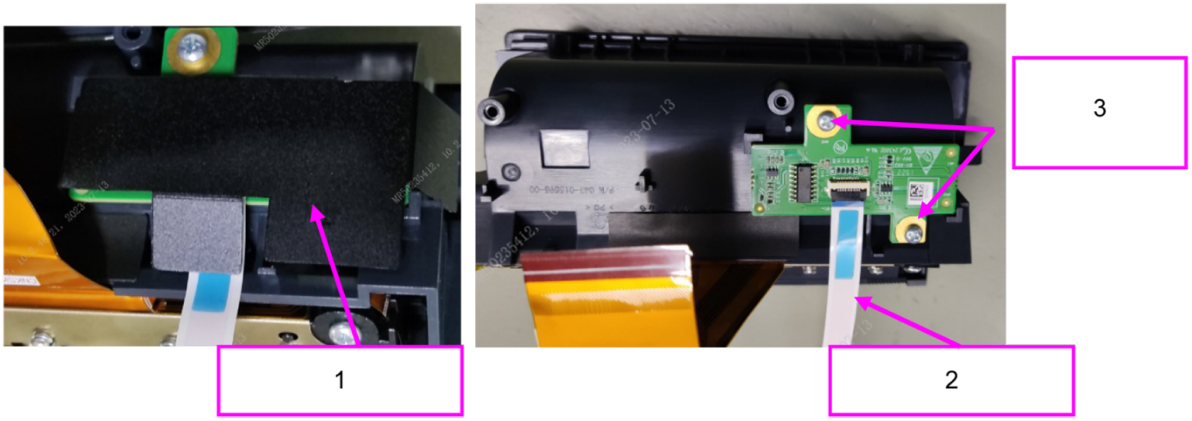


FRU Code	FRU Name	Lower-Level FRU Code	Lower-Level FRU Name
115-097053-00	SIM Board Assembly (0659) FRU	009-013585-00	Wire FFC 12pin Pitch 0.5mm (Different Side Connection)

6.80.2 Disassembly and Assembly

1. Make preparations according to **6.1** Preparation Before Disassembly.
2. Disassemble the main unit according to **6.4** Main Unit Disassembly.
3. For the disassembly of 0659 Recorder Component FRU, see the 0659 Recorder Component FRU **6.63.2** Disassembly and Assembly.
4. Specific steps:
   Remove the SIM insulation sheet, and use a crosshead screwdriver to remove the two PT3X8 crosshead self-tapping screws on the SIM board. Remove the SIM board and connection cable from the SIM board to the wireless module FFC.

Figure6–194



1	SIM Insulation Sheet
2	SIM Board Connection Cable
3	Two PT3X8 self-tapping screws

6.80.3 Commissioning and Verification

None

6.81 SIM Insulation Sheet

6.81.1 General Information

None

6.81.2 Disassembly and Assembly

None

6.81.3 Commissioning and Verification

None

6.82 WiFi+4G module package(EU) FRU

6.82.1 Debugging and Verification

None

6.82.2 Disassembly and Assembly

None

6.82.3 General Information

None

6.83 WiFi+4G module package(EU) FRU

6.83.1 Debugging and Verification

None

6.83.2 Disassembly and Assembly

None

6.83.3 General Information

None

7 Troubleshooting

7.1 Overview

7.1.1 Overview

This chapter classifies faults according to the faulty components and fault phenomena in the defibrillation monitor for troubleshooting. The faults shall be checked, located, and troubleshooted in sequence according to the corresponding fault table.

The recommended solutions in this chapter can help you solve most device faults but not all possible faults. In the case of any fault that is not described in this chapter, contact our after-sales service department.

7.1.2 Part Replacement

The circuit board and other major parts and components in the defibrillation monitor are replaceable. After the faulty part or component of the circuit board is located, it can be replaced with a new one following the steps in ***Chapter 6 FRU Replacement***. Then check if the fault is eliminated or the defibrillation monitor can pass the relevant test. If the fault is eliminated, it demonstrates that the original circuit board part is damaged. In this case, please return the original part to us for repair. If the fault persists, reinstall the original part and continue troubleshooting for other possible reasons.

7.1.3 Device Status Checking

Some troubleshooting tasks may involve the hardware version and device status of the defibrillation monitor. Check the device status according to the following steps:

1. Choose **Main Menu>Review>Events**. In the pop-up menu, you can view the system boot time and technical alarm information.
2. Choose **Main Menu>System >>>Maintenance >>**→Enter Manufacturer Maintenance Password→**Device Information >>**. On the Device Information screen, you can view the current device status.

7.1.4 Device Information Checking

Some troubleshooting tasks may involve software version compatibility. At this point, you need to know the configuration and software version information of your defibrillation monitor. For information on software version compatibility, contact our After-sales Service. Check the software version according to the following steps:

Choose **Main Menu→System >>→Maintenance >>**→Enter Manufacturer/User Maintenance Password→**Version Information >>**. In the **Version Information** screen, you can view the version information of the system software and software of all the modules.

7.1.5 Technical Alarms and Diagnosis

Check whether the defibrillation monitor displays a technical alarm before troubleshooting. If so, please release the alarm first. For information and reasons of and solutions to the technical alarm, please refer to the product manual.

7.2 Intuitive Performance Class Troubleshooting

7.2.1 Display Fault

7.2.1.1 Poor Screen Display

Fault Description

Poor Screen Display

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

White screen, blurred screen, black screen

Involved FRU

0659 Front Cover Assembly FRU

Troubleshooting

None

Solution

Check the screen connection cable and display screen. Reconnect or replace the front cover assembly in the case of errors. For details, see **6.76.2** Disassembly and Assembly.

7.2.1.2 No Response on Touch Screen

Fault Description

No Response on Touch Screen

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The touch screen fails

Involved FRU

0659 Front Cover Assembly FRU

Troubleshooting

None

Solution

Check the screen connection cable and display screen. Reconnect or replace the front cover assembly in the case of errors. For details, see **6.76.2** Disassembly and Assembly.

7.2.1.3 Touch Screen Mistrigger

Fault Description

Touch Screen Mistrigger

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

ESD or electrotome interference, leading to touch screen mistrigger

Involved FRU

0659 Front Cover Assembly FRU

Troubleshooting

None

Solution

1. Adjust to the low sensitivity mode to confirm if the problem is present.
2. Check the screen connection cable and display screen. Reconnect or replace the front cover assembly in the case of errors. For details, see **6.76.2** Disassembly and Assembly.

7.2.2 Network Malfunction

7.2.2.1 Failure to Establish Wireless Connection

Fault Description

Failure to Establish Wireless Connection

Severity

Maintenance as soon as possible

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Wireless connection function failure

Involved FRU

1. 0658 Main Board PCBA FRU
2. Wi-Fi Board Assy FRU
3. 4G Board Assy (CN) FRU
4. 4G Board Assy (EU) FRU

Troubleshooting

None

Solution

1. Check the network settings and reset the network in the case of abnormal settings.
2. Check the software version.
3. Replace the main control board/wireless module. For details, see 115-090684-00 0658 Main Board PCBA FRU **6.50.2** Disassembly and Assembly.

7.2.2.2 Unstable Wireless Connection

Fault Description

Unstable Wireless Connection

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Weak signal.

Involved FRU

None

Troubleshooting

None

Solution

Check the network environment.

7.2.3 Appearance Fault

7.2.3.1 Physical Damage and Corrosion

Fault Description

Physical Damage and Corrosion

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Physical damage, cleaning disinfectants, moisture and other reasons lead to corrosion of the pump body and electronic components.

Involved FRU

None

Troubleshooting

None

Solution

Replace the damaged FRU.

7.2.3.2 Abnormal Appearance

Fault Description

Abnormal Appearance

Severity

Maintenance as soon as possible

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Silk faded, not clear, damaged, etc.

Involved FRU

None

Troubleshooting

None

Solution

1. Investigate the use of disinfectants (brand/model, frequency of disinfection).
2. Replace the shell.

7.2.3.3 Equipment Smoking/Smelling Burnt/On Fire

Fault Description

Equipment Smoking/Smelling Burnt/On Fire

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Equipment smoking/burning smell/on fire caused by overly high temperature, short circuit, etc.

Involved FRU

None

Troubleshooting

None

Solution

1. Investigate the use environment to find out whether there is liquid inlet.
2. Replace damaged parts.

7.2.4 Pace-making Fault

7.2.4.1 Abnormal Pacing Function

Fault Description

Abnormal Pacing Function

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Therapy board malfunction

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Troubleshooting

None

Solution

Replace the defibrillation therapy board. For details, see **6.62.2** Disassembly and Assembly.

7.2.5 Recorder Fault

7.2.5.1 Poor Printing Effect of Recorder

Fault Description

Poor Printing Effect of Recorder

Severity

Maintenance as soon as possible

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Paper not in place or door not closed or recorder module malfunction

Involved FRU

0659 Recorder Component FRU

Troubleshooting

None

Solution

1. Check that the printing paper for the recorder is in place.
2. Check that the door is closed.
3. Replace the recorder (see **6.63.2** Disassembly and Assembly).

7.2.5.2 Recorder Printing Failure

Fault Description

Recorder Printing Failure

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Paper not in place or door not closed or recorder module malfunction

Involved FRU

0659 Recorder Component FRU

Troubleshooting

None

Solution

1. Check that the printing paper for the recorder is in place.
2. Check that the door is closed.
3. Replace the recorder (see **6.63.2** Disassembly and Assembly).

7.2.6 Accessory Fault

7.2.6.1 Test Load Damage

Fault Description

Test Load Damage

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Fail in self checking.

Involved FRU

None

Troubleshooting

None

Solution

Replace the test load.

7.2.6.2 Paddle Fault

Fault Description

Paddle Fault

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Unable to discharge.

Involved FRU

None

Troubleshooting

None

Solution

Replace the extracorporal board.

7.2.6.3 Paddle Rusting

Fault Description

Paddle Rusting

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Discharge energy accuracy affected

Involved FRU

None

Troubleshooting

None

Solution

Replace the extracorporal board.

7.2.6.4 Poor Contact of Paddle

Fault Description

Poor Contact of Paddle

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Not in place

Involved FRU

None

Troubleshooting

None

Solution

Replace the paddle and carry out user test.

7.2.7 Power Error

7.2.7.1 Power-on Failure

Fault Description

Power-on Failure

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Failure of the keypad, main board, or integrated board

Involved FRU

1. 0658 Key Board Assy (Domestic) FRU
2. 0658 Key Board Assy (NFC/Domestic) FRU
3. Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)
4. 0658 Main Board PCBA FRU

Troubleshooting

None

Solution

1. Replace the keypad. For details, see the 0658 Keypad Assy (Domestic) FRU **6.51.2** Disassembly and Assembly or 0658 Keypad Assy (NFC/Domestic) FRU **6.52.2** Disassembly and Assembly.
2. Replace the integrated board. For details, see **6.62.2** Disassembly and Assembly.
3. Replace the main control board. For details, see **6.50.2** Disassembly and Assembly.

7.2.7.2 Power-off Failure

Fault Description

Power-off Failure

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Failure of the keypad or integrated board

Involved FRU

1. 0658 Key Board Assy (Domestic) FRU
2. 0658 Key Board Assy (NFC/Domestic) FRU
3. Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Troubleshooting

None

Solution

1. Replace the keypad. For details, see the 0658 Keypad Assy (Domestic) FRU **6.51.2** Disassembly and Assembly or 0658 Keypad Assy (NFC/Domestic) FRU **6.52.2** Disassembly and Assembly.
2. Replace the integrated board. For details, see **6.62.2** Disassembly and Assembly.

7.2.7.3 Overlong Battery Charging Duration

Fault Description

Overlong Battery Charging Duration

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Battery aging or charging circuit error

Involved FRU

None

Troubleshooting

None

Solution

1. Check the battery and replace it if it is abnormal.
2. Check the battery module and replace it if it is abnormal.

7.2.7.4 Battery charging failed

Fault Description

Battery charging failed

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Battery failure or battery interface failure or charging circuit failure or software failure causes the battery to fail to charge.

Involved FRU

1. 0659 DX Battery Backplate
2. 0659 DX Power Adapter Board
3. Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Troubleshooting

None

Solution

1. Check the software version.
2. Check the battery and replace it if it is abnormal.
3. Replace the power board if it is abnormal. For details, see **6.45.2** Disassembly and Assembly.

7.2.7.5 Battery Fault

Fault Description

Battery Fault

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Battery failure or battery interface failure or charging circuit failure or software failure causes the battery to fail to charge.

Involved FRU

1. 0659 DX Battery Backplate
2. 0659 DX Power Adapter Board
3. Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Troubleshooting

None

Solution

1. Check the battery and replace it if it is abnormal.
2. Replace the power board if it is abnormal. For details, see **6.45.2** Disassembly and Assembly.

7.2.7.6 Battery Aging

Fault Description

Battery Aging

Severity

Maintenance as soon as possible

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Battery Aging

Involved FRU

None

Troubleshooting

None

Solution

Replace the battery.

7.2.7.7 Short Battery Life

Fault Description

Short Battery Life

Severity

Maintenance as soon as possible

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Battery Aging

Involved FRU

None

Troubleshooting

None

Solution

Replacing the Battery

7.2.8 Defibrillation Error

7.2.8.1 High Undischarged Impedance

Fault Description

High Undischarged Impedance

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The discharge circuit resistance exceeds the designated scope (therapy board, internal wire, extracorporal board, etc.), leading to failure in releasing defibrillation energy.

Involved FRU

None

Troubleshooting

None

Solution

1. Run user test and record the fault code if it fails. Select FRU according to the fault code.
2. If it passes the user test, it indicates the possibility of connection failure between the extracorporal board/pad and the human body.

7.2.8.2 Low Undischarged Impedance

Fault Description

Low Undischarged Impedance

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The discharge circuit resistance exceeds the designated scope (therapy board, internal wire, extracorporal board, etc.), leading to failure in releasing defibrillation energy.

Involved FRU

None

Troubleshooting

None

Solution

1. Run user test and record the fault code if it fails. Select FRU according to the fault code.
2. If it passes the user test, it indicates the possibility of connection failure between the extracorporal board/pad and the human body.

7.2.8.3 Low Discharge Energy Accuracy

Fault Description

Low Discharge Energy Accuracy

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The energy storage capacitor is aging and decaying, resulting in low discharge energy.

Involved FRU

0656 Large Capacitance

Troubleshooting

None

Solution

Run user test to confirm whether the discharge energy accuracy meets the specification. If it exceeds the specification, replace the 009-010141-000655 large capacitance wire. For details, see **6.11.2** Disassembly and Assembly.

7.2.8.4 Charging Failure

Fault Description

Charging Failure

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Failure of the energy storage capacitor or therapy board, leading to failure to start charging.

Involved FRU

1. 0656 Large Capacitance
2. Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Troubleshooting

None

Solution

Run user test. Select FRU according to the fault code hint.

7.2.8.5 Slow Charging Speed

Fault Description

Slow Charging Speed

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Storage capacitor or battery failure, resulting in slow charging or timeout.

Involved FRU

0656 Large Capacitance

Troubleshooting

None

Solution

Run user test. Select FRU according to the fault code hint.

7.2.8.6 Energy Regulation Failure

Fault Description

Energy Regulation Failure

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Poor connection of extracorporal board or faulty keypad

Involved FRU

1. 0658 Key Board Assy (Domestic) FRU
2. 0658 Key Board Assy (NFC/Domestic) FRU

Troubleshooting

None

Solution

Replug the extracorporal board. Run user test. Select FRU according to the fault code hint.

7.2.9 Parameter Measurement Error

7.2.9.1 Failure to Connect CPR Sensor to Main Unit

Fault Description

Failure to Connect CPR Sensor to Main Unit

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Failure in hard connection or no response after connection

Involved FRU

None

Troubleshooting

None

Solution

Replace the relevant connection cable.

7.2.9.2 ECG Communication Error/No Waveform

Fault Description

ECG Communication Error/No Waveform

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Failure in parameter measurement and no waveform

Involved FRU

None

Troubleshooting

None

Solution

Check ECG leads.

7.2.9.3 SpO2 Probe Fault

Fault Description

SpO2 Probe Fault

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

No waveform measured

Involved FRU

None

Troubleshooting

None

Solution

Replace the probe.

7.2.9.4 No SpO2 Value Measured

Fault Description

No SpO2 Value Measured

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

No value measured

Involved FRU

See the handling solution for N1.

Troubleshooting

None

Solution

Replace the probe, main cable or SpO2 board.

7.2.9.5 No NIBP Value Measured

Fault Description

No NIBP Value Measured

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

No value measured

Involved FRU

See the handling solution for N1.

Troubleshooting

None

Solution

1. Check if the oversleeve is well connected.
2. Check if the air channel is free from leakage: air channel connection.

3. Replace the parameter module.

7.2.9.6 Inflation Failure for NIBP Measurement

Fault Description

Inflation Failure for NIBP Measurement

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

No value measured

Involved FRU

See the handling solution for N1.

Troubleshooting

None

Solution

1. Check if the oversleeve is well connected.
2. Check if the air channel is free from leakage: air channel connection.
3. Replace the parameter module.

7.2.9.7 No Waveform in ECG Measurement

Fault Description

No Waveform in ECG Measurement

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

No value measured

Involved FRU

See the handling solution for N1.

Troubleshooting

None

Solution

1. Check if the lead and pad are well connected.
2. Replace the lead or parameter module.

7.2.9.8 Excessive Noise in ECG Measurement

Fault Description

Excessive Noise in ECG Measurement

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Excessive noise in measurement

Involved FRU

See the handling solution for N1.

Troubleshooting

None

Solution

1. Check if the lead and pad are well connected.
2. Check whether there is a source of disturbance in the surrounding environment.
3. Replace the lead or parameter module.

7.2.9.9 ECG Lead Damaged

Fault Description

ECG Lead Damaged

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

None

Involved FRU

None

Troubleshooting

None

Solution

Replace the lead wire.

7.2.10 Alarm Fault

7.2.10.1 Low Alarm Volume

Fault Description

Low Alarm Volume

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Abnormal horn or driver circuit

Involved FRU

1. Speaker FRU
2. 0658 Main Board PCBA FRU

Troubleshooting

None

Solution

1. Adjust the alarm volume.
2. Check the horn cable and the horn and reconnect or replace the speaker FRU in the case of error. For details, see **6.49.2** Disassembly and Assembly.
3. Replace the main control board. For details, see **6.50.2** Disassembly and Assembly.

7.2.10.2 No Alarm Sound

Fault Description

No Alarm Sound

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Fault of horn cable or horn

Involved FRU

1. Speaker FRU
2. 0658 Main Board PCBA FRU

Troubleshooting

None

Solution

1. Check the horn cable and the horn and reconnect or replace the speaker FRU in the case of error. For details, see **6.49.2** Disassembly and Assembly.
2. Replace the main control board. For details, see **6.50.2** Disassembly and Assembly.

7.2.10.3 Abnormal Alarm Sound

Fault Description

Abnormal Alarm Sound

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Abnormal tone

Involved FRU

1. Speaker FRU
2. 0658 Main Board PCBA FRU

Troubleshooting

None

Solution

1. Check the software version.
2. Check the horn cable and the horn and reconnect or replace the speaker FRU in the case of error. For details, see **6.49.2** Disassembly and Assembly.
3. Replace the main control board. For details, see **6.50.2** Disassembly and Assembly.

7.2.10.4 Non-working Alarm Light

Fault Description

Non-working Alarm Light

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

Fault of alarm light cable or LED

Involved FRU

1. D60 alarm indicator board PCBA
2. 0658 Main Board PCBA FRU

Troubleshooting

None

Solution

1. Check the cable of the alarm light board or the alarm light board. Reconnect or replace D60 alarm indicator board PCBA in the case of error. For details, see **6.40.2** Disassembly and Assembly.
2. Replace the main control board. For details, see **6.50.2** Disassembly and Assembly.

7.2.11 Button Fault

7.2.11.1 Non-responsive Button

Fault Description

Non-responsive Button

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The button doesn’t respond after it is pressed.

Involved FRU

1. 0658 Key Board Assy (Domestic) FRU
2. 0658 Key Board Assy (NFC/Domestic) FRU

Troubleshooting

None

Solution

1. Check if the connection cable is loose.
2. Replace the key board. For details, see the 0658 Key Board Assy FRU **6.51.2** Disassembly and Assembly or 0658 Key Board Assy (NFC) FRU **6.52.2** Disassembly and Assembly.

7.2.11.2 Non-responsive Coder

Fault Description

Non-responsive Coder

Severity

Suspension

Response

Contact the device provider for onsite troubleshooting.

Possible Causes

The coder doesn’t respond after it is operated.

Involved FRU

0656 D60 Coder PCBA

Troubleshooting

None

Solution

Replace the coder PCBA. For details, see **6.41.2** Disassembly and Assembly.

7.3 Code Fault Handling

7.3.1 Therapy Module Fault

7.3.1.1 1: M0+ Power-on CPU Self Checking Failure

Fault Code

1

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on CPU Self Checking Failure
Service Engineer Permission	M0+ Power-on CPU Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.2 2: M0+ Power-on RAM Self Checking Failure

Fault Code

2

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on RAM Self Checking Failure
Service Engineer Permission	M0+ Power-on RAM Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.3 3: M0+ Power-on ROM Self Checking Failure

Fault Code

3

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on ROM Self Checking Failure
Service Engineer Permission	M0+ Power-on ROM Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.4 4: M0+ Power-on Watchdog Self Checking Failure

Fault Code

4

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on Watchdog Self Checking Failure
Service Engineer Permission	M0+ Power-on Watchdog Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.5 5: M0+ Power-on ADC Self Checking Failure

Fault Code

5

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on ADC Self Checking Failure
Service Engineer Permission	M0+ Power-on ADC Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.6 6: M3 Power-on Register Self Checking Failure

Fault Code

6

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on Register Self Checking Failure
Service Engineer Permission	M3 Power-on Register Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.7 7: M3 Power-on RAM Self Checking Failure

Fault Code

7

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on RAM Self Checking Failure
Service Engineer Permission	M3 Power-on RAM Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.8 8: M3 Power-on ROM Self Checking Failure

Fault Code

8

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on ROM Self Checking Failure
Service Engineer Permission	M3 Power-on ROM Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.9 9: M3 Power-on Watchdog Self Checking Failure

Fault Code

9

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on Watchdog Self Checking Failure
Service Engineer Permission	M3 Power-on Watchdog Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.10 10: M0+ Power-on ASIC Self Checking Failure

Fault Code

10

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Power-on ASIC Self Checking Failure
Service Engineer Permission	M0+ Power-on ASIC Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.11 11: M3 Power-on CPU Self Checking Failure

Fault Code

11

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on CPU Self Checking Failure
Service Engineer Permission	M3 Power-on CPU Self Checking Failure

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.12 12: M3 Power-on Hardware Version Number Error

Fault Code

12

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Power-on Hardware Version Number Error
Service Engineer Permission	M3 Power-on Hardware Version Number Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.13 13: M0 Power-on Hardware Version Number Error

Fault Code

13

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 Power-on Hardware Version Number Error
Service Engineer Permission	M0 Power-on Hardware Version Number Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.14 31: 1s Following Pacing Charging Starting: V1/2<=20V

Fault Code

31

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	1s Following Pacing Charging Starting: V1/2<=20V
Service Engineer Permission	1s Following Pacing Charging Starting: V1/2<=20V

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.15 32: After Pacing Charging Completion: V1>240V

Fault Code

32

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	After Pacing Charging Completion: V1>240V
Service Engineer Permission	After Pacing Charging Completion: V1>240V

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.16 33: During Pacing Charging: V1/2>240V

Fault Code

33

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	During Pacing Charging: V1/2>240V
Service Engineer Permission	During Pacing Charging: V1/2>240V

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.17 45: M0+ Abnormal Reduction

Fault Code

45

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0+ Abnormal Reduction
Service Engineer Permission	M0+ Abnormal Reduction

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.18 46: ASIC Error

Fault Code

46

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	ASIC Error
Service Engineer Permission	ASIC Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.19 47: M3 Abnormal Reduction

Fault Code

47

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Abnormal Reduction
Service Engineer Permission	M3 Abnormal Reduction

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.20 48: M3 and M0+ Communication Error

Fault Code

48

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 and M0+ Communication Error
Service Engineer Permission	M3 and M0+ Communication Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.21 49: M3 Real-Time ADC Self Checking Error

Fault Code

49

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Real-Time ADC Self Checking Error
Service Engineer Permission	M3 Real-Time ADC Self Checking Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.22 50: M3 Chip Calculation Function Error

Fault Code

50

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 Chip Calculation Function Error
Service Engineer Permission	M3 Chip Calculation Function Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.23 51: Upon Charging Starting: |V1-V2| > 500V

Fault Code

51

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Upon Charging Starting: |V1-V2| > 500V
Service Engineer Permission	Upon Charging Starting: |V1-V2| > 500V

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.24 52: 1s Following Charging Starting: V1<= 65V or V2 <= 65V

Fault Code

52

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	1s Following Charging Starting: V1<= 65V or V2 <= 65V
Service Engineer Permission	1s Following Charging Starting: V1<= 65V or V2 <= 65V

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.25 53: V1/V2 Drop Exceeding 10% of V1/V2tgt During Charging

Fault Code

53

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1/V2 Drop Exceeding 10% of V1/V2tgt During Charging
Service Engineer Permission	V1/V2 Drop Exceeding 10% of V1/V2tgt During Charging

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.26 54: |V1-V2| > 128V During Charging and Usage and |V1-V2| > 108V During Self Checking

Fault Code

54

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	|V1-V2| > 128V During Charging and Usage and |V1-V2| > 108V During Self Checking
Service Engineer Permission	|V1-V2| > 128V During Charging and Usage and |V1-V2| > 108V During Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.27 55: V1>=2400V or V2>=2400V During Charging

Fault Code

55

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1>=2400V or V2>=2400V During Charging
Service Engineer Permission	V1>=2400V or V2>=2400V During Charging

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.28 56: Charging Not Completed Within 25s After Charging Starting

Fault Code

56

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charging Not Completed Within 25s After Charging Starting
Service Engineer Permission	Charging Not Completed Within 25s After Charging Starting

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.29 57: After Charging Completion: V1>(V1Tgt*1.2)

Fault Code

57

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	After Charging Completion: V1>(V1Tgt*1.2)
Service Engineer Permission	After Charging Completion: V1>(V1Tgt*1.2)

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.30 58: V1<=50V or V2<=50V During Charging

Fault Code

58

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1<=50V or V2<=50V During Charging
Service Engineer Permission	V1<=50V or V2<=50V During Charging

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.31 59: V1>(V1Tgt*1.2) or V2>(V1Tgt*1.2) During Charging

Fault Code

59

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1>(V1Tgt*1.2) or V2>(V1Tgt*1.2) During Charging
Service Engineer Permission	V1>(V1Tgt*1.2) or V2>(V1Tgt*1.2) During Charging

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.32 60: Overcurrent During Self-discharge

Fault Code

60

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Overcurrent During Self-discharge
Service Engineer Permission	Overcurrent During Self-discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.33 61: V1>=40V or V2>=40V post Self-discharge

Fault Code

61

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1>=40V or V2>=40V post Self-discharge
Service Engineer Permission	V1>=40V or V2>=40V post Self-discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.34 62: Overvoltage Protection Occurring

Fault Code

62

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Overvoltage Protection Occurring
Service Engineer Permission	Overvoltage Protection Occurring

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.35 63: Error in Zeroing Sample Value

Fault Code

63

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Error in Zeroing Sample Value
Service Engineer Permission	Error in Zeroing Sample Value

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.36 64: Error in Gain Calibration Sample Value

Fault Code

64

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Error in Gain Calibration Sample Value
Service Engineer Permission	Error in Gain Calibration Sample Value

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.37 65: Error in Calculation Slope in Gain Calibration

Fault Code

65

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Error in Calculation Slope in Gain Calibration
Service Engineer Permission	Error in Calculation Slope in Gain Calibration

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.38 66: Zeroing Failure prior to Gain Calibration

Fault Code

66

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Zeroing Failure prior to Gain Calibration
Service Engineer Permission	Zeroing Failure prior to Gain Calibration

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.39 67: FLASH Error in Calibration Information Write

Fault Code

67

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	FLASH Error in Calibration Information Write
Service Engineer Permission	FLASH Error in Calibration Information Write

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.40 68: FLASH Error in Calibration Information Read

Fault Code

68

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	FLASH Error in Calibration Information Read
Service Engineer Permission	FLASH Error in Calibration Information Read

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.41 71: Abnormal Pacing Power Supply

Fault Code

71

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Pacing Power Supply
Service Engineer Permission	Abnormal Pacing Power Supply

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.42 72: Abnormal Pacing Relay

Fault Code

72

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Pacing Relay
Service Engineer Permission	Abnormal Pacing Relay

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.43 73: Wrong Pacing Frequency

Fault Code

73

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Wrong Pacing Frequency
Service Engineer Permission	Wrong Pacing Frequency

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.44 74: Abnormal Pacing Current

Fault Code

74

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Pacing Current
Service Engineer Permission	Abnormal Pacing Current

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.45 75: Abnormal Pacing DA

Fault Code

75

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Pacing DA
Service Engineer Permission	Abnormal Pacing DA

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.46 76: Abnormal Human Body Voltage During Pacing

Fault Code

76

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Human Body Voltage During Pacing
Service Engineer Permission	Abnormal Human Body Voltage During Pacing

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.47 77: Overcurrent Protection Point of Pacing Too High

Fault Code

77

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Overcurrent Protection Point of Pacing Too High
Service Engineer Permission	Overcurrent Protection Point of Pacing Too High

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.48 78: Pacing Overcurrent Protection Fault

Fault Code

78

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Pacing Overcurrent Protection Fault
Service Engineer Permission	Pacing Overcurrent Protection Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.49 81: Auxiliary Positioning Encountered Pace-making Fault in Scenario 1

Fault Code

81

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 1
Service Engineer Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 1

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.50 82: Auxiliary Positioning Encountered Pace-making Fault in Scenario 2

Fault Code

82

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 2
Service Engineer Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 2

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.51 83: Auxiliary Positioning Encountered Pace-making Fault in Scenario 3

Fault Code

83

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 3
Service Engineer Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 3

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.52 84: Auxiliary Positioning Encountered Pace-making Fault in Scenario 4

Fault Code

84

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 4
Service Engineer Permission	Auxiliary Positioning Encountered Pace-making Fault in Scenario 4

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.53 91: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 1

Fault Code

91

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 1
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 1

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.54 92: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 2

Fault Code

92

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 2
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 2

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.55 93: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 3

Fault Code

93

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 3
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 3

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.56 94: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 4

Fault Code

94

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 4
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 4

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.57 95: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 5

Fault Code

95

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 5
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 5

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.58 96: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 6

Fault Code

96

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 6
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 6

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.59 97: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 7

Fault Code

97

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 7
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 7

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.60 98: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 8

Fault Code

98

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 8
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 8

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.61 99: Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 9

Fault Code

99

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 9
Service Engineer Permission	Abnormal Value of Auxiliary Positioning Encountered Pace-making Fault (Voltage or Current) in Range 9

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.62 201: Self Checking Failure of Function Self Checking AD

Fault Code

201

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Function Self Checking AD
Service Engineer Permission	Self Checking Failure of Function Self Checking AD

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.63 202: Timeout and Incompletion of Clock Self Checking in Function Self Checking

Fault Code

202

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Timeout and Incompletion of Clock Self Checking in Function Self Checking
Service Engineer Permission	Timeout and Incompletion of Clock Self Checking in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.64 203: Clock Frequency Error in Clock Self Checking in Function Self Checking

Fault Code

203

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Clock Frequency Error in Clock Self Checking in Function Self Checking
Service Engineer Permission	Clock Frequency Error in Clock Self Checking in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.65 210: Defibrillation Charging Failure in Function Self Checking

Fault Code

210

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Defibrillation Charging Failure in Function Self Checking
Service Engineer Permission	Defibrillation Charging Failure in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.66 211: Charging Timeout in Function Self Checking

Fault Code

211

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charging Timeout in Function Self Checking
Service Engineer Permission	Charging Timeout in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.67 212: Charge Maintenance Failure in Function Self Checking

Fault Code

212

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charge Maintenance Failure in Function Self Checking
Service Engineer Permission	Charge Maintenance Failure in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.68 216: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

216

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.69 217: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

217

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.70 218: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

218

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.71 219: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

219

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.72 220: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

220

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.73 221: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

221

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.74 222: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

222

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.75 223: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

223

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.76 224: Self Checking Failure of Discharge Circuit in Function Self Checking

Fault Code

224

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure of Discharge Circuit in Function Self Checking
Service Engineer Permission	Self Checking Failure of Discharge Circuit in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.77 225: Function Self Checking Failure: Discharge Circuit: Closed Bridge Arm, Abnormal Internal Discharge Resistance

Fault Code

225

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Function Self Checking Failure: Discharge Circuit: Closed Bridge Arm, Abnormal Internal Discharge Resistance
Service Engineer Permission	Function Self Checking Failure: Discharge Circuit: Closed Bridge Arm, Abnormal Internal Discharge Resistance

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.78 226: Self Checking Failure in Function Self Checking upon the Completion of Discharge

Fault Code

226

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure in Function Self Checking upon the Completion of Discharge
Service Engineer Permission	Self Checking Failure in Function Self Checking upon the Completion of Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.79 230: Self Checking Failure in Small Signal Impedance Detection in Function Self Checking

Fault Code

230

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure in Small Signal Impedance Detection in Function Self Checking
Service Engineer Permission	Self Checking Failure in Small Signal Impedance Detection in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.80 231: Defibrillation Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking

Fault Code

231

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Defibrillation Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking
Service Engineer Permission	Defibrillation Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.81 232: Test Load Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking

Fault Code

232

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Test Load Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking
Service Engineer Permission	Test Load Relay Short Circuit in Small Signal Impedance Detection in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.82 233: V1-V2 Exceeding [2.4, 25]V During Pacing MOS Self Checking

Fault Code

233

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V1-V2 Exceeding [2.4, 25]V During Pacing MOS Self Checking
Service Engineer Permission	V1-V2 Exceeding [2.4, 25]V During Pacing MOS Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.83 234: V2-V3 Exceeding [2.4, 20]V During Pacing MOS Self Checking

Fault Code

234

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V2-V3 Exceeding [2.4, 20]V During Pacing MOS Self Checking
Service Engineer Permission	V2-V3 Exceeding [2.4, 20]V During Pacing MOS Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.84 235: V3-V4 Exceeding [2.4, 17]V During Pacing MOS Self Checking

Fault Code

235

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	V3-V4 Exceeding [2.4, 17]V During Pacing MOS Self Checking
Service Engineer Permission	V3-V4 Exceeding [2.4, 17]V During Pacing MOS Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.85 257: Self Checking Failure in N1 RFLAG in Function Self Checking

Fault Code

257

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure in N1 RFLAG in Function Self Checking
Service Engineer Permission	Self Checking Failure in N1 RFLAG in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.86 258: Self Checking Failure in P-guide ECG in Function Self Checking

Fault Code

258

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure in P-guide ECG in Function Self Checking
Service Engineer Permission	Self Checking Failure in P-guide ECG in Function Self Checking

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.87 259: Self Checking Failure in PFlag & RFlag in Function Self Checking (After fault code 259, an additional fault code 90-99 will be reported to record the number of Rflags received by the M3 when the fault 259 occurs. 90-99 means 0-9 Rflags are received, and the fault code remains 99 if more than 9 Rflags are received)

Fault Code

259

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Failure in PFlag & RFlag in Function Self Checking (After fault code 259, an additional fault code 90-99 will be reported to record the number of Rflags received by the M3 when the fault 259 occurs. 90-99 means 0-9 Rflags are received, and the fault code remains 99 if more than 9 Rflags are received)
Service Engineer Permission	Self Checking Failure in PFlag & RFlag in Function Self Checking (After fault code 259, an additional fault code 90-99 will be reported to record the number of Rflags received by the M3 when the fault 259 occurs. 90-99 means 0-9 Rflags are received, and the fault code remains 99 if more than 9 Rflags are received)

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.88 260: M3 5V7 Power Fault

Fault Code

260

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 5V7 Power Fault
Service Engineer Permission	M3 5V7 Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.89 261: M3 +-5V Power Fault

Fault Code

261

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 +-5V Power Fault
Service Engineer Permission	M3 +-5V Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.90 262: M3 +18V Power Fault

Fault Code

262

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 +18V Power Fault
Service Engineer Permission	M3 +18V Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.91 263: M3 3V3 Power Fault

Fault Code

263

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M3 3V3 Power Fault
Service Engineer Permission	M3 3V3 Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.92 264: M0 AVCC Power Fault

Fault Code

264

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 AVCC Power Fault
Service Engineer Permission	M0 AVCC Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.93 265: M0 AVSS Power Fault

Fault Code

265

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 AVSS Power Fault
Service Engineer Permission	M0 AVSS Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.94 266: M0 +2V5 Power Fault

Fault Code

266

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 +2V5 Power Fault
Service Engineer Permission	M0 +2V5 Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.95 267: M0 -2V5 Power Fault

Fault Code

267

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 -2V5 Power Fault
Service Engineer Permission	M0 -2V5 Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.96 268: M0 ASIC_VREF Power Fault

Fault Code

268

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 ASIC_VREF Power Fault
Service Engineer Permission	M0 ASIC_VREF Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.97 269: M0 DVDD Power Fault

Fault Code

269

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	M0 DVDD Power Fault
Service Engineer Permission	M0 DVDD Power Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.98 270: Forbidden to Charge When the Internal Cable Is Connected to the Human Body

Fault Code

270

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Forbidden to Charge When the Internal Cable Is Connected to the Human Body
Service Engineer Permission	Forbidden to Charge When the Internal Cable Is Connected to the Human Body

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.99 271: Discharge Upper Tube Failing to Discharge due to Short Circuit Fault

Fault Code

271

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Discharge Upper Tube Failing to Discharge due to Short Circuit Fault
Service Engineer Permission	Discharge Upper Tube Failing to Discharge due to Short Circuit Fault

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.100 272: Large Capacitance Drop Exceeding 5% Within 3s During 360J Charging for Automatic Self Checking

Fault Code

272

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Large Capacitance Drop Exceeding 5% Within 3s During 360J Charging for Automatic Self Checking
Service Engineer Permission	Large Capacitance Drop Exceeding 5% Within 3s During 360J Charging for Automatic Self Checking

Possible Causes

The therapy part of the integrated board is faulty or the large capacitance is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) or 0656 Large Capacitance Wire

Solution

Re-run user test and confirmation. Contact the relevant person to replace the relevant FRU if the problem remains. For details, see Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) **6.62.2** Disassembly and Assembly or 0656 Large Capacitance Wire **6.11.2** Disassembly and Assembly.

7.3.1.101 273: Large Capacitance Exceeding Threshold [195+/-30%]uF During 360J External Discharge for User Self Checking

Fault Code

273

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Large Capacitance Exceeding Threshold [195+/-30%]uF During 360J External Discharge for User Self Checking
Service Engineer Permission	Large Capacitance Exceeding Threshold [195+/-30%]uF During 360J External Discharge for User Self Checking

Possible Causes

The therapy part of the integrated board is faulty or the large capacitance is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) or 0656 Large Capacitance Wire

Solution

Re-run user test and confirmation. Contact the relevant person to replace the relevant FRU if the problem remains. For details, see Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) **6.62.2** Disassembly and Assembly or 0656 Large Capacitance Wire **6.11.2** Disassembly and Assembly.

7.3.1.102 274: Defibrillation Energy Double Backup Check Error

Fault Code

274

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Defibrillation Energy Double Backup Check Error
Service Engineer Permission	Defibrillation Energy Double Backup Check Error

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.103 277: Significant Error in Defibrillation Discharge Resistance

Fault Code

277

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Significant Error in Defibrillation Discharge Resistance
Service Engineer Permission	Significant Error in Defibrillation Discharge Resistance

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.104 281: Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Fault Code

281

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge
Service Engineer Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.105 282: Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Fault Code

282

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge
Service Engineer Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.106 283: Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Fault Code

283

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge
Service Engineer Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.107 284: Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Fault Code

284

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge
Service Engineer Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.108 285: Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Fault Code

285

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge
Service Engineer Permission	Auxiliary Positioning of Overcurrent During Defibrillation Discharge

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.1.109 291: Identification of New and Old Extracorporal Paddle Exceeding 3s

Fault Code

291

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Identification of New and Old Extracorporal Paddle Exceeding 3s
Service Engineer Permission	Identification of New and Old Extracorporal Paddle Exceeding 3s

Possible Causes

The therapy part of the integrated board is faulty or the extracorporal board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) or Extracorporal Board

Solution

Re-run user test and confirmation. Contact the relevant person to replace the relevant FRU if the problem remains. For details, see 115-094603-00 Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration) **6.62.2** Disassembly and Assembly or Extracorporal Board **6.26.2** Disassembly and Assembly.

7.3.2 Power Module Fault

7.3.2.1 143: Battery Communication Error

Fault Code

143

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery Communication Error
Service Engineer Permission	Battery Communication Error

Possible Causes

Battery Fault

Involved FRU

None

Solution

Check if the battery is properly installed and replace it with a new one if it is not.

7.3.2.2 144: Abnormal Power Voltage

Fault Code

144

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Power Voltage
Service Engineer Permission	Abnormal Power Voltage

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.3 145: Battery Charging Fault

Fault Code

145

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery Charging Fault
Service Engineer Permission	Battery Charging Fault

Possible Causes

Battery Fault

Involved FRU

None

Solution

Check if the battery is properly installed and replace it with a new one if it is not.

7.3.2.4 146: Power-on Self Checking Error

Fault Code

146

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Power-on Self Checking Error
Service Engineer Permission	Power-on Self Checking Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.5 147: Main Board Fault

Fault Code

147

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Main Board Fault
Service Engineer Permission	Main Board Fault

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.2.6 151: Low Charge of Battery 1

Fault Code

151

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Low Charge of Battery 1
Service Engineer Permission	Low Charge of Battery 1

Possible Causes

The current battery charge is below the low charge threshold.

Involved FRU

None

Solution

Connect an AC power supply to charge the battery.

7.3.2.7 152: Extremely Low Charge of Battery 1

Fault Code

152

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Extremely Low Charge of Battery 1
Service Engineer Permission	Extremely Low Charge of Battery 1

Possible Causes

The current battery charge is below the extremely low charge threshold.

Involved FRU

None

Solution

Connect an AC power supply to charge the battery.

7.3.2.8 153: Battery 1 Fault

Fault Code

153

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 1 Fault
Service Engineer Permission	Battery 1 Fault

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.9 154: Battery 1 Aging

Fault Code

154

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 1 Aging
Service Engineer Permission	Battery 1 Aging

Possible Causes

Battery Aging

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.10 155: RTC Self Checking Failure

Fault Code

155

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	RTC Self Checking Failure
Service Engineer Permission	RTC Self Checking Failure

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.11 156: Low Charge and Low Voltage

Fault Code

156

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Low Charge and Low Voltage
Service Engineer Permission	Low Charge and Low Voltage

Possible Causes

The current battery charge is below the low charge and low voltage thresholds.

Involved FRU

None

Solution

Connect an AC power supply to charge the battery.

7.3.2.12 157: Battery 1 Charging Fault

Fault Code

157

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 1 Charging Fault
Service Engineer Permission	Battery 1 Charging Fault

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.13 160: Failure to Identify Battery Model

Fault Code

160

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Failure to Identify Battery Model
Service Engineer Permission	Failure to Identify Battery Model

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.14 161: Abnormal Battery EEPROM Data

Fault Code

161

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Abnormal Battery EEPROM Data
Service Engineer Permission	Abnormal Battery EEPROM Data

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.15 162: Charging Current Greater than 10A

Fault Code

162

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charging Current Greater than 10A
Service Engineer Permission	Charging Current Greater than 10A

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.16 163: Charging (Current Greater than 0.7A Discharge) Overrunning by 45s

Fault Code

163

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charging (Current Greater than 0.7A Discharge) Overrunning by 45s
Service Engineer Permission	Charging (Current Greater than 0.7A Discharge) Overrunning by 45s

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.17 164: Charging/Discharging IO Flipping Overrunning by 45s

Fault Code

164

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Charging/Discharging IO Flipping Overrunning by 45s
Service Engineer Permission	Charging/Discharging IO Flipping Overrunning by 45s

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.18 165: Battery Voltage Detection Error (Inconsistency Between VUSB1 and VBUS2)

Fault Code

165

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery Voltage Detection Error (Inconsistency Between VUSB1 and VBUS2)
Service Engineer Permission	Battery Voltage Detection Error (Inconsistency Between VUSB1 and VBUS2)

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.19 170: Low Charge of Battery 2

Fault Code

170

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Low Charge of Battery 2
Service Engineer Permission	Low Charge of Battery 2

Possible Causes

The current battery charge is below the low charge threshold.

Involved FRU

None

Solution

Connect an AC power supply to charge the battery.

7.3.2.20 171: Extremely Low Charge of Battery 2

Fault Code

171

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Extremely Low Charge of Battery 2
Service Engineer Permission	Extremely Low Charge of Battery 2

Possible Causes

The current battery charge is below the extremely low charge threshold.

Involved FRU

None

Solution

Connect an AC power supply to charge the battery.

7.3.2.21 172: Battery 2 Fault

Fault Code

172

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 2 Fault
Service Engineer Permission	Battery 2 Fault

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.22 173: Battery 2 Aging

Fault Code

173

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 2 Aging
Service Engineer Permission	Battery 2 Aging

Possible Causes

Battery Aging

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.23 174: Battery 2 Charging Fault

Fault Code

174

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Battery 2 Charging Fault
Service Engineer Permission	Battery 2 Charging Fault

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.2.24 175: VBUS Fault

Fault Code

175

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	VBUS Fault
Service Engineer Permission	VBUS Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.25 176: 18V Fault

Fault Code

176

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	18V Fault
Service Engineer Permission	18V Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.26 177: 5V Fault

Fault Code

177

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	5V Fault
Service Engineer Permission	5V Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.27 178: 3.3V Fault

Fault Code

178

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	3.3V Fault
Service Engineer Permission	3.3V Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.28 179: 12V Fault

Fault Code

179

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	12V Fault
Service Engineer Permission	12V Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.29 180: VCC Fault

Fault Code

180

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	VCC Fault
Service Engineer Permission	VCC Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.30 181: VBB Fault

Fault Code

181

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	VBB Fault
Service Engineer Permission	VBB Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.31 182: ADSYSV Fault

Fault Code

182

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	ADSYSV Fault
Service Engineer Permission	ADSYSV Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.32 183: AD5VD Fault

Fault Code

183

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	AD5VD Fault
Service Engineer Permission	AD5VD Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.33 184: 25703 Register Setting Error

Fault Code

184

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	25703 Register Setting Error
Service Engineer Permission	25703 Register Setting Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.34 185: AD5VDD Fault

Fault Code

185

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	AD5VDD Fault
Service Engineer Permission	AD5VDD Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.35 186: 12VPP Fault

Fault Code

186

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	12VPP Fault
Service Engineer Permission	12VPP Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.36 187: 5VDD Fault

Fault Code

187

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	5VDD Fault
Service Engineer Permission	5VDD Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.2.37 188: 5VBB Fault

Fault Code

188

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	5VBB Fault
Service Engineer Permission	5VBB Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3 Main Control Module Fault

7.3.3.1 189: N1 Charging 12V Fault

Fault Code

189

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Charging 12V Fault
Service Engineer Permission	N1 Charging 12V Fault

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.2 403: Communication Error in Power Board

Fault Code

403

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Communication Error in Power Board
Service Engineer Permission	Communication Error in Power Board

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.3 404: Communication Error in Therapy Board

Fault Code

404

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Communication Error in Therapy Board
Service Engineer Permission	Communication Error in Therapy Board

Possible Causes

The therapy part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.4 405: Self Checking Error in Main Control Module

Fault Code

405

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Error in Main Control Module
Service Engineer Permission	Self Checking Error in Main Control Module

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.5 406: Real-Time Clock Error

Fault Code

406

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Real-Time Clock Error
Service Engineer Permission	Real-Time Clock Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.6 407: Memory Card Read and Write Error

Fault Code

407

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Memory Card Read and Write Error
Service Engineer Permission	Memory Card Read and Write Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.7 409: Machine Type Identification Error

Fault Code

409

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Machine Type Identification Error
Service Engineer Permission	Machine Type Identification Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.8 410: Recorder Communication Error

Fault Code

410

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Recorder Communication Error
Service Engineer Permission	Recorder Communication Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.9 411: Key User Self Checking Error

Fault Code

411

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Key User Self Checking Error
Service Engineer Permission	Key User Self Checking Error

Possible Causes

Keypad fault

Involved FRU

0658 Key Board Assy (Without NFC) FRU or 0658 Key Board Assy (with NFC) FRU

Solution

Re-run user test and confirmation. Contact the relevant person to replace the relevant FRU if the problem remains. For details, see 0658 Key Board Assy (Without NFC) FRU **6.51.2** Disassembly and Assembly or 0658 Key Board Assy (with NFC) FRU. **6.52.2** Disassembly and Assembly

7.3.3.10 412: Speaker User Self Checking Error

Fault Code

412

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Speaker User Self Checking Error
Service Engineer Permission	Speaker User Self Checking Error

Possible Causes

The speaker is faulty.

Involved FRU

Speaker FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.49.2** Disassembly and Assembly.

7.3.3.11 413: Real-Time Clock Inaccuracy

Fault Code

413

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Real-Time Clock Inaccuracy
Service Engineer Permission	Real-Time Clock Inaccuracy

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.12 414: Key Adhesion

Fault Code

414

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Key Adhesion
Service Engineer Permission	Key Adhesion

Possible Causes

Keypad fault

Involved FRU

0658 Key Board Assy (Without NFC) FRU or 0658 Key Board Assy (with NFC) FRU

Solution

Re-run user test and confirmation. Contact the relevant person to replace the relevant FRU if the problem remains. For details, see 0658 Key Board Assy (Without NFC) FRU **6.51.2** Disassembly and Assembly or 0658 Key Board Assy (with NFC) FRU. **6.52.2** Disassembly and Assembly

7.3.3.13 415: Program CRC Check Error

Fault Code

415

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Program CRC Check Error
Service Engineer Permission	Program CRC Check Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.14 417: AT Battery 1 Discharge Error

Fault Code

417

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	AT Battery 1 Discharge Error
Service Engineer Permission	AT Battery 1 Discharge Error

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.3.15 418: AT Battery 2 Discharge Error

Fault Code

418

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	AT Battery 2 Discharge Error
Service Engineer Permission	AT Battery 2 Discharge Error

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.3.16 419: UT Battery 1 Discharge Error

Fault Code

419

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	UT Battery 1 Discharge Error
Service Engineer Permission	UT Battery 1 Discharge Error

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.3.17 420: UT Battery 2 Discharge Error

Fault Code

420

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	UT Battery 2 Discharge Error
Service Engineer Permission	UT Battery 2 Discharge Error

Possible Causes

Battery Fault

Involved FRU

None

Solution

Replace the battery with a new one.

7.3.3.18 423: Failure in Loading User Configuration

Fault Code

423

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Failure in Loading User Configuration
Service Engineer Permission	Failure in Loading User Configuration

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.19 424: Maintenance Lamp User Self Checking Error

Fault Code

424

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Maintenance Lamp User Self Checking Error
Service Engineer Permission	Maintenance Lamp User Self Checking Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.20 426: Power Integrated Board Self Checking Error

Fault Code

426

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Power Integrated Board Self Checking Error
Service Engineer Permission	Power Integrated Board Self Checking Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.21 431: Power-on IO Self Checking Error on 3.3V Power

Fault Code

431

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Power-on IO Self Checking Error on 3.3V Power
Service Engineer Permission	Power-on IO Self Checking Error on 3.3V Power

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.22 432: Overcurrent on Recorder

Fault Code

432

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Overcurrent on Recorder
Service Engineer Permission	Overcurrent on Recorder

Possible Causes

Recorder module fault

Involved FRU

0659 Recorder Component FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.63.2** Disassembly and Assembly.

7.3.3.23 434: Dormant IO Self Checking Error

Fault Code

434

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Dormant IO Self Checking Error
Service Engineer Permission	Dormant IO Self Checking Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.24 435: RTC Arousing IO Self Checking Error

Fault Code

435

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	RTC Arousing IO Self Checking Error
Service Engineer Permission	RTC Arousing IO Self Checking Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.25 436: Wrong Order from Therapy Board

Fault Code

436

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Wrong Order from Therapy Board
Service Engineer Permission	Wrong Order from Therapy Board

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.26 437: Therapeutic Handshake Packet Error Report

Fault Code

437

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Therapeutic Handshake Packet Error Report
Service Engineer Permission	Therapeutic Handshake Packet Error Report

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.27 438: Therapeutic Discharge Failure

Fault Code

438

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Therapeutic Discharge Failure
Service Engineer Permission	Therapeutic Discharge Failure

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.28 455: Turning on Device after Abnormal Shutdown

Fault Code

455

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Turning on Device after Abnormal Shutdown
Service Engineer Permission	Turning on Device after Abnormal Shutdown

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.29 456: Wrong Impedance Indicator on Paddle

Fault Code

456

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Wrong Impedance Indicator on Paddle
Service Engineer Permission	Wrong Impedance Indicator on Paddle

Possible Causes

Extracorporal board fault

Involved FRU

None

Solution

Replace the extracorporal board.

7.3.3.30 457: Automatic Self Checking IO Self Checking Error

Fault Code

457

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Automatic Self Checking IO Self Checking Error
Service Engineer Permission	Automatic Self Checking IO Self Checking Error

Possible Causes

The power part of the integrated board is faulty.

Involved FRU

Integrated Board Assembly of DX Rear Cover FRU (Standard Configuration)

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.62.2** Disassembly and Assembly.

7.3.3.31 458: Self Checking Error of Paddle Button

Fault Code

458

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Self Checking Error of Paddle Button
Service Engineer Permission	Self Checking Error of Paddle Button

Possible Causes

Extracorporal board fault

Involved FRU

None

Solution

Replace the extracorporal board.

7.3.3.32 459: Display User Self Checking Error

Fault Code

459

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Display User Self Checking Error
Service Engineer Permission	Display User Self Checking Error

Possible Causes

LCD failure

Involved FRU

0659 Screen Assembly FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.76.2** Disassembly and Assembly.

7.3.3.33 460: SPI FPGA Version Getting Error

Fault Code

460

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	SPI FPGA Version Getting Error
Service Engineer Permission	SPI FPGA Version Getting Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.34 461: Screen Connection IO Self Checking Error

Fault Code

461

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Screen Connection IO Self Checking Error
Service Engineer Permission	Screen Connection IO Self Checking Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.35 462: Keypad Connection IO Self Checking Error

Fault Code

462

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Keypad Connection IO Self Checking Error
Service Engineer Permission	Keypad Connection IO Self Checking Error

Possible Causes

Keypad cable is not properly connected or is loose.

Involved FRU

None

Solution

Re-run user test and confirmation. Contact the relevant person to confirm if the cable is properly connected if the problem remains.

7.3.3.36 463: IO Self Checking Error in Front-Rear-Shell Connection

Fault Code

463

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	IO Self Checking Error in Front-Rear-Shell Connection
Service Engineer Permission	IO Self Checking Error in Front-Rear-Shell Connection

Possible Causes

Front and rear shells are not properly connected or the connection is loose.

Involved FRU

None

Solution

Re-run user test and confirmation. Contact the relevant person to confirm if the cable is properly connected if the problem remains.

7.3.3.37 464: Getting Display FPGA Version Error

Fault Code

464

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Getting Display FPGA Version Error
Service Engineer Permission	Getting Display FPGA Version Error

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.38 465: N1 Connection Error

Fault Code

465

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Connection Error
Service Engineer Permission	N1 Connection Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.39 466: N1 M51C Self Checking Error

Fault Code

466

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 M51C Self Checking Error
Service Engineer Permission	N1 M51C Self Checking Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.40 467: N1 CO2 Self Checking Error

Fault Code

467

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 CO2 Self Checking Error
Service Engineer Permission	N1 CO2 Self Checking Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.41 468: N1 NIBP Self Checking Error

Fault Code

468

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 NIBP Self Checking Error
Service Engineer Permission	N1 NIBP Self Checking Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.42 469: N1 Battery Disconnected

Fault Code

469

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery Disconnected
Service Engineer Permission	N1 Battery Disconnected

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.43 470: N1 Low Battery Capacity

Fault Code

470

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Low Battery Capacity
Service Engineer Permission	N1 Low Battery Capacity

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.44 471: N1 Battery 1 Aging

Fault Code

471

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 1 Aging
Service Engineer Permission	N1 Battery 1 Aging

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.45 472: N1 Battery 1 Fault

Fault Code

472

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 1 Fault
Service Engineer Permission	N1 Battery 1 Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.46 473: N1 Battery 1 Charging Fault

Fault Code

473

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 1 Charging Fault
Service Engineer Permission	N1 Battery 1 Charging Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.47 474: N1 Battery 2 Aging

Fault Code

474

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 2 Aging
Service Engineer Permission	N1 Battery 2 Aging

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.48 475: N1 Battery 2 Fault

Fault Code

475

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 2 Fault
Service Engineer Permission	N1 Battery 2 Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.49 476: N1 Battery 2 Charging Fault

Fault Code

476

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery 2 Charging Fault
Service Engineer Permission	N1 Battery 2 Charging Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.50 477: N1 Storage Fault

Fault Code

477

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Storage Fault
Service Engineer Permission	N1 Storage Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.51 478: N1 Power Communication Error

Fault Code

478

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Power Communication Error
Service Engineer Permission	N1 Power Communication Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.52 479: N1 3.3V Power Too High

Fault Code

479

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 3.3V Power Too High
Service Engineer Permission	N1 3.3V Power Too High

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.53 480: N1 3.3V Power Too Low

Fault Code

480

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 3.3V Power Too low
Service Engineer Permission	N1 3.3V Power Too low

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.54 481: N1 5V Power Too High

Fault Code

481

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 5V Power Too High
Service Engineer Permission	N1 5V Power Too High

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.55 482: N1 5V Power Too Low

Fault Code

482

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 5V Power Too low
Service Engineer Permission	N1 5V Power Too low

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.56 483: N1 12V Power Too High

Fault Code

483

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 12V Power Too High
Service Engineer Permission	N1 12V Power Too High

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.57 484: N1 12V Power Too Low

Fault Code

484

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 12V Power Too low
Service Engineer Permission	N1 12V Power Too low

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.58 485: N1 Wi-Fi Module Fault

Fault Code

485

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	The N1 Wi-Fi module fails.
Service Engineer Permission	The N1 Wi-Fi module fails.

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.59 486: N1 Bluetooth Module Fault

Fault Code

486

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Bluetooth Module Fault
Service Engineer Permission	N1 Bluetooth Module Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.60 487: N1 Touch Screen Fault

Fault Code

487

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Touch Screen Fault
Service Engineer Permission	N1 Touch Screen Fault

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.61 488: Bluetooth Module Fault

Fault Code

488

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Bluetooth Module Fault
Service Engineer Permission	Bluetooth Module Fault

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.62 489: Wi-Fi Module (Station) Fault

Fault Code

489

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Wi-Fi Module (Station) Fault
Service Engineer Permission	Wi-Fi Module (Station) Fault

Possible Causes

The Wi-Fi module fails.

Involved FRU

Wi-Fi Board Assy FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.55.2** Disassembly and Assembly.

7.3.3.63 490: Wi-Fi Module (AP) Fault

Fault Code

490

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Wi-Fi Module (AP) Fault
Service Engineer Permission	Wi-Fi Module (AP) Fault

Possible Causes

The main control board is faulty.

Involved FRU

0658 Main Board PCBA FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.50.2** Disassembly and Assembly.

7.3.3.64 491: Touch Screen Fault

Fault Code

491

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	The touchscreen is faulty.
Service Engineer Permission	The touchscreen is faulty.

Possible Causes

LCD failure

Involved FRU

0659 Screen Assembly FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.76.2** Disassembly and Assembly.

7.3.3.65 492: Expansion Board Power-on Self Checking Error

Fault Code

492

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Expansion Board Power-on Self Checking Error
Service Engineer Permission	Expansion Board Power-on Self Checking Error

Possible Causes

Slave processor board fault

Involved FRU

Slave Board Assy FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.54.2** Disassembly and Assembly.

7.3.3.66 494: Expansion Board Fault (Test Timeout)

Fault Code

494

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Expansion Board Fault (Test Timeout)
Service Engineer Permission	Expansion Board Fault (Test Timeout)

Possible Causes

Slave processor board fault

Involved FRU

Slave Board Assy FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.54.2** Disassembly and Assembly.

7.3.3.67 495: N1 Battery Capacity Depleted

Fault Code

495

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Battery Capacity Depleted
Service Engineer Permission	N1 Battery Capacity Depleted

Possible Causes

The battery capacity is depleted.

Involved FRU

None

Solution

Charge the battery.

7.3.3.68 496: N1 Power-on IO Self Checking Error

Fault Code

496

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Power-on IO Self Checking Error
Service Engineer Permission	N1 Power-on IO Self Checking Error

Possible Causes

The N1 module fails.

Involved FRU

None

Solution

For details, see N1 maintenance manual.

7.3.3.69 497: Camera Initialization Error

Fault Code

497

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Camera Initialization Error
Service Engineer Permission	Camera Initialization Error

Possible Causes

Camera fault

Involved FRU

0659 Camera Assembly FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.53.2** Disassembly and Assembly.

7.3.3.70 498: Camera Communication Error

Fault Code

498

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	Camera Communication Error
Service Engineer Permission	Camera Communication Error

Possible Causes

Camera fault

Involved FRU

115-090710-00 0659 Camera Assembly FRU

Solution

Re-run user test and confirmation. Replace the relevant FRU if the problem remains. For details, see **6.53.2** Disassembly and Assembly.

7.3.3.71 499: N1 Module Mismatch

Fault Code

499

Fault Description

User Permission of Viewing Errors	Fault Description Corresponding to the Permission
User and Administrator Permission	N1 Module Mismatch
Service Engineer Permission	N1 Module Mismatch

Possible Causes

None

Involved FRU

None

Solution

None