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Nanjing Perlove Medical Equipment Co., Ltd.

Add: No.97, Wangxi Road, Jiangning District, Nanjing 211122, China

Tel: 86-25-87187780/68571666

P5102.04.1(2)EM(2025PL-12-02)

PLX5100

Mobile Digital Radiography System

USER'S MANUAL

PERLOVE MEDICAL
Nanjing Perlove Medical Equipment Co., Ltd

Content

I. Information Introduction

1. Company Overview

1.1 Registered Name: Nanjing Perlove Medical Equipment Co., Ltd.

1.2 Registered Address: No.97, Wangxi Road, Jiangning District, Nanjing 211122, China.

1.3 Production Name: Nanjing Perlove Medical Equipment Co., Ltd.

1.4 Production House: No.97, Wangxi Road, Jiangning District, Nanjing 211122, China.

1.5 Production Address: No.97, Wangxi Road, Jiangning District, Nanjing 211122, China.

1.6 Contact: Tel: 86-25-87187780, Fax: 86-25-87187780

1.7 After-sale Service Department: 86-25-87187780

1.8 Medical Instrument Manufacturing Enterprise License No.: S.Y.J.X.S.C.X. No. 20030034

2. Product Information

2.1 Product Name: Mobile Digital Radiography System

2.2 Specifications: PLX5100

2.3 Medical Instrument Registration Certificate No.: JSFDA Certified No. 20202060448

2.4 Product technical requirement No.: JSFDA Certified No. 20202060448

2.5 Production Date: See the product nameplate.

2.6 Use period: Ten years

2.7 Manual version: Version No.: P5102.04.1(2)EM, Revision date: 2025.07.01

2.8 Software release version No.: V1

II. Product General Description

1. Product Features

1.1 With international advanced direct digital X-ray imaging technology and portable and mobile DR detector, the X-ray equipment has the advantages of high quality, high efficiency, large size, low power consumption.

1.2 Adopting high-frequency and high-voltage generator, kV and mAs digital closed loop control, real-time control by microprocessor, guarantee the accuracy and repeatability of dose.

1.3 Two-button adjustment by kV and mAs, display by LCD and data protection when

power down.

1.4 It is equipped with multiple functions such as overvoltage protection, overcurrent protection and overload protection to make the equipment more safe and reliable.

1.5 The ergonomic structure design is simple and convenient for operation.

1.6 Conforming to DICOM3.0 standard.

2. Application Scope

For routine photography of patients, acquiring single image for clinical diagnosis.

3. Equipment Classifications

Equipment classification with respect to protection from electric shock: Class I equipment.

Degree of protection from electric shock: Type B application part.

Degree of protection against ingress of liquids: IPX0.

Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with nitrous oxide

Mode of operation: Continuous operation with intermittent loading

The unit does not include parts of signal input and output.

The unit is mobile equipment.

4. Environmental Conditions

4.1 Temperature: +10℃～+40℃.

4.2 Relative Humidity: 30%～75%.

4.3 Atmospheric Pressure: 700hpa～1060hpa.

4.4 No corrosive and explosive gas. No dust.

5. Power Supply Conditions

5.1 Power Supply Voltage: ~220V.

5.2 Power Supply Frequency: 50/60Hz.

5.3 Power Supply Internal Resistance: ≤1Ω.

5.4 Input power : 9kVA

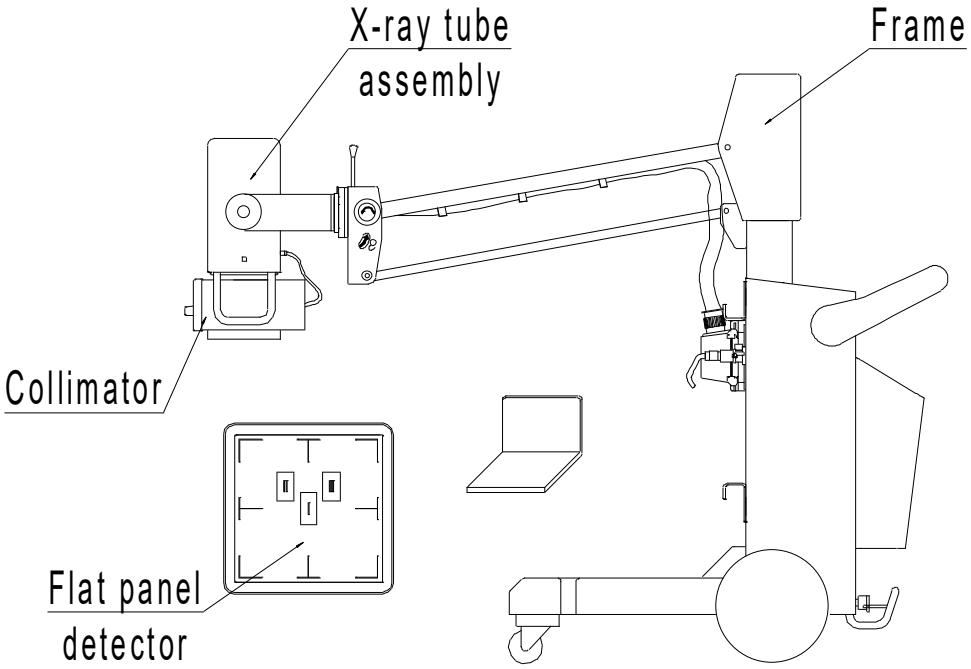
5.5 Has a good protective grounding line position.

Caution: DO NOT connect the unit to a temporary generator with smaller capacity than required, or connect in parallel to circuit that has been loaded with other electric loading devices such as electric welding machine.

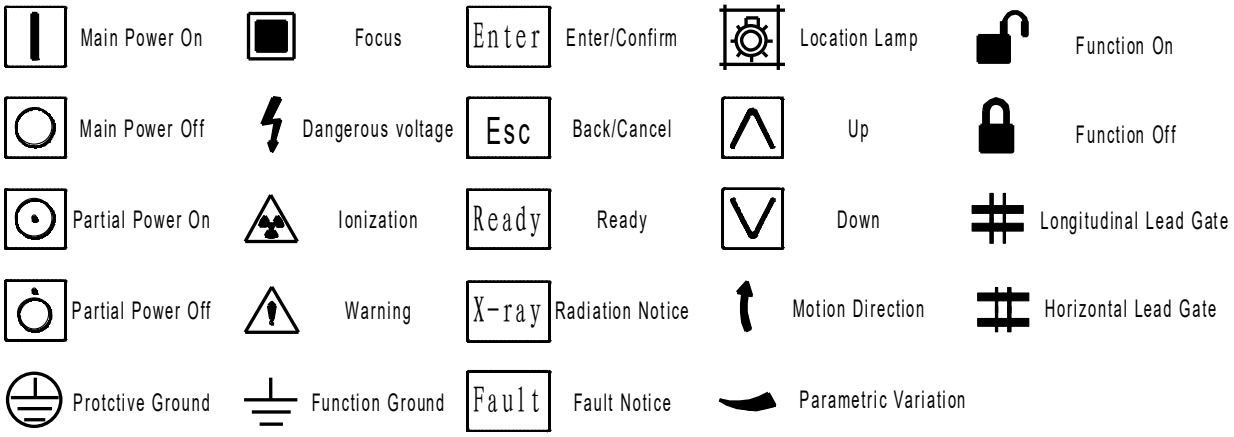
III. Structural Feature and Operating Principle

1. Primary Structure

This equipment consists of combined X-ray tube assembly, collimator, frame, flat panel detector. Refer to the picture below:



2. Definition of Signs



3. Working Principles

According to the principle that attenuation is different when X-ray emitted from X-ray tube goes through different tissues and organs of the patient's body, the X-ray equipment can transfer image formed by projecting X-rays which pass through patients and take along enough information onto an imaging medium to visible plane grayscale image.

3.1 High Voltage Circuit

The high voltage needed by X-ray tube is rectified from commutating current 220V to DC 300V, added to inverter, producing not less than 50 kHz inverting frequency square wave. Then it is increased to the set voltage value by passing the transformer in the X-ray generator's components and the voltage doubling circuit. Voltage regulation is conducted by the means of phase shifting control mode.

3.2 Filament Circuit

The voltage needed by X-ray tube for lighting up filament is provided by filament power board. After the DC24V is adjusted, DC voltage adjustable within a certain range is produced, then the wave inverted from the DC voltage through the circuit is delivered to the filament transformer to energize the filament after being isolate.

3.3 Control Circuit

X-ray parameter is controlled and display by control panel, high voltage circuit and filament circuit is controlled by CPU to realize the control to kV and mAs. The power range is shown as 40~120Kv. Digital closed-loop control is adopted to control mAs value. Besides, the control panel has additional functions of saving kV and mAs parameters, state check and output control.

3.4 Imaging

With the flat panel detector shoots simultaneous exposure with X-rays, a digital image will be generated and transferred to workstation through network module. After the workstation's intelligent image processing, a bright and clear image will be presented.

IV. Technical Specifications

1. X-ray Source Assembly

1.1 X-ray Tube

1.1.1 Model: Q100D

1.1.2 Norminal X-ray tube voltage: 125kV

1.1.3 Focus: 0.6/1.8

1.1.4 Norminal input power supply: 5.3kW

1.1.5 Target material: Tungsten

1.1.6 Target angle: 15°

1.1.7 Datum axis: pass through the midperpendicular of X-ray source assembly window

1.1.8 Deviation between focus and datum axis: <1mm

1.1.9 The angle between target and datum axis: 15°

1.1.10 Anode heat capacity: 35.5kJ

1.1.11 Maximum continuous cooling rate: 600W

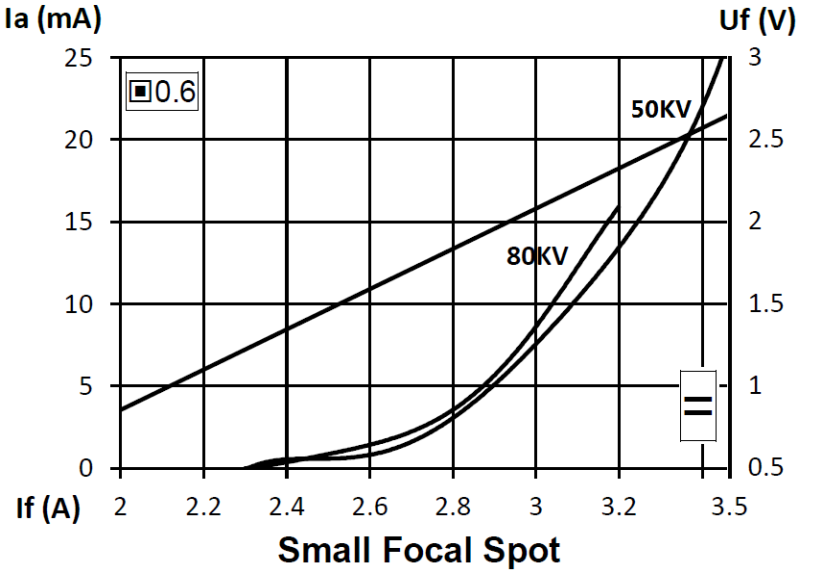
1.1.12 The minimum amount of inherent filtration: 0.8mmAl

1.1.13 Power supply of high voltage generator: high voltage inverter power supply

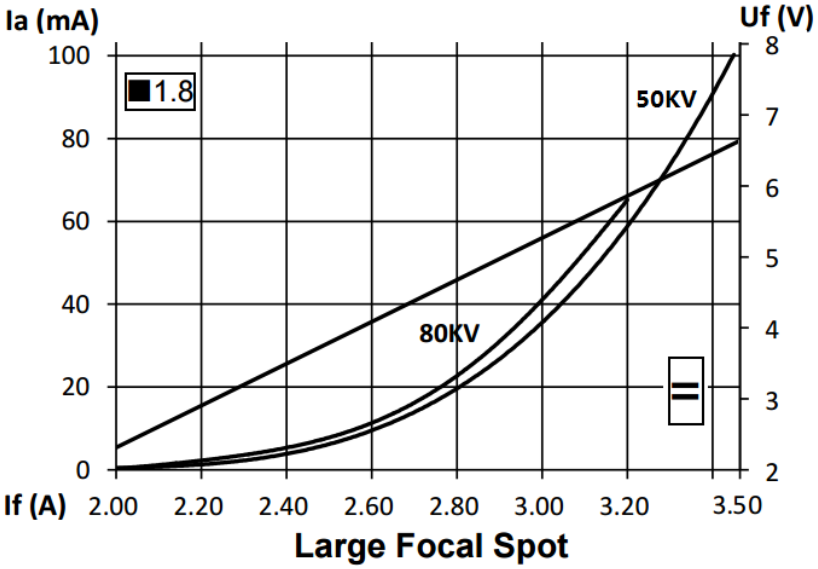
1.1.14 Power unit of filament: filament board

1.1.15 Load curve

Filament characteristic curve, Filament emission characteristic curve:

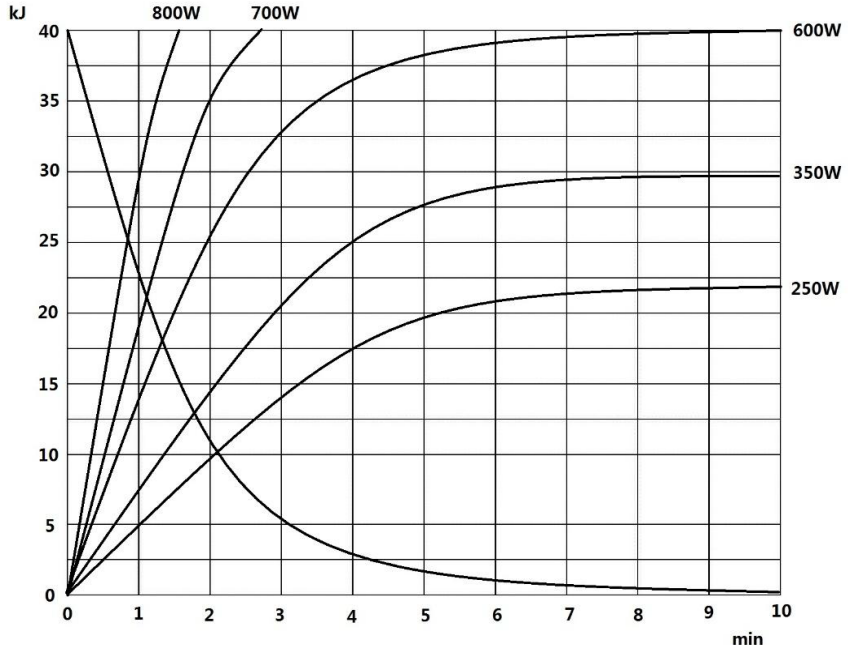


Small Focal Spot

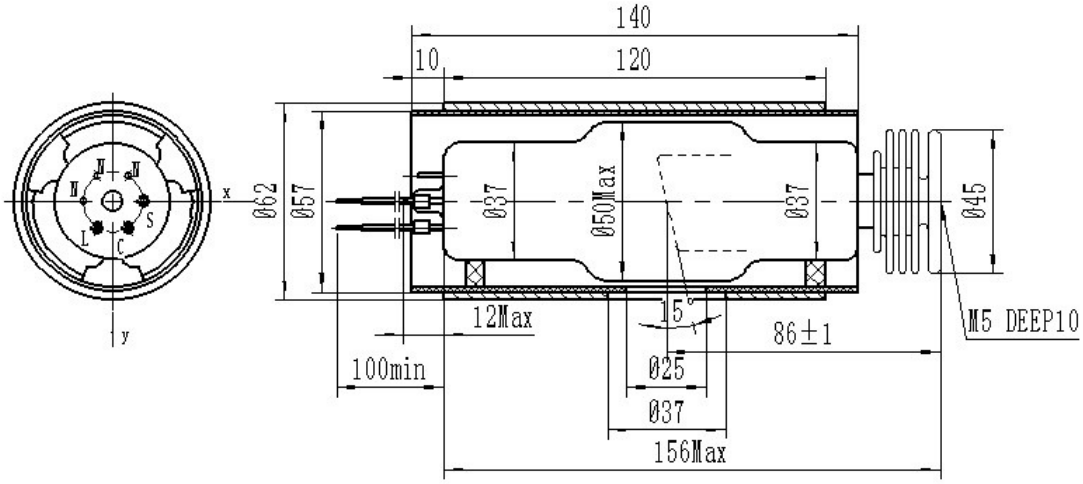


Large Focal Spot

Anode heating and cooling curve:



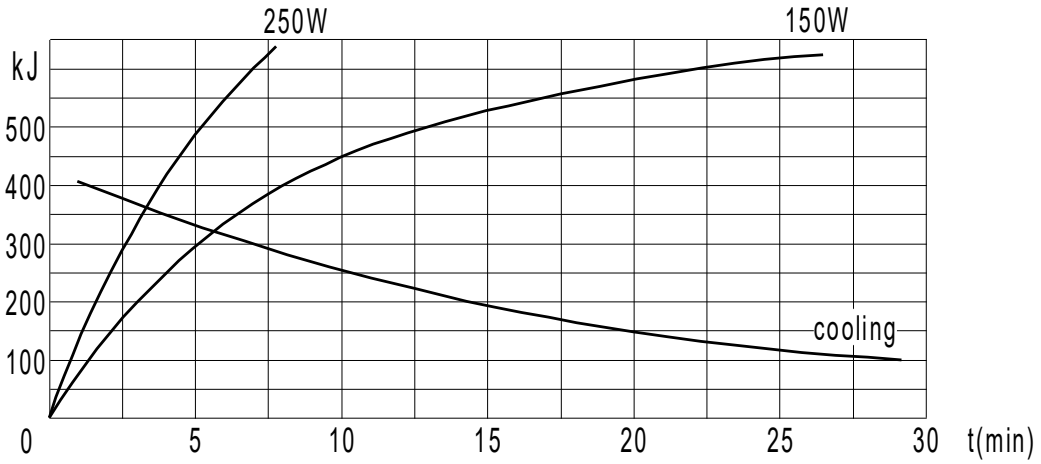
1.1.16 Outside view



1.2 X-ray tube assembly

1.2.1 Thermal capacity: 500kJ

1.2.2 Characteristic curve for heating and cooling



1.2.3 Max continuous heat dissipation: 60W

1.2.4 Target angle: 15°

1.2.5 Datum axis: Perpendicular bisector passing through X-ray source assembly window

1.2.6 The angle between target and datum axis: 15°

1.2.7 The equivalent inherent filtration: 1.5mmAl

1.2.8 Division: Class I type B

1.2.9 Cooling medium: transformer oil; Cooling method: natural cooling

1.2.10 Running mode: intermittent load, work continuously

1.2.11 Baseline loading conditions: 120kV, 2mA

1.2.12 Stated maximum input energy per hour: 400mAs

1.2.13 Loading state of the leakage radiation: ≤1.0mGy/h

1.2.14 Weight of X-ray tube assembly: 20kg

1.2.15 Norminal X-ray tube voltage: 120kV

1.2.16 Power supply of high voltage generator: high voltage inverter power supply

1.2.17 Power unit of filament: filament board

1.2.18 Condition of transportation and storage

a) Environmental temperature of packed X-ray tube assembly should be -20℃ ~ +55 ℃, relative humidity 10% ~ 100% non-condensable gases, atmospheric pressure 500hPa ~ 1060hPa indoor.

b) Transport requirement according to the contract order.

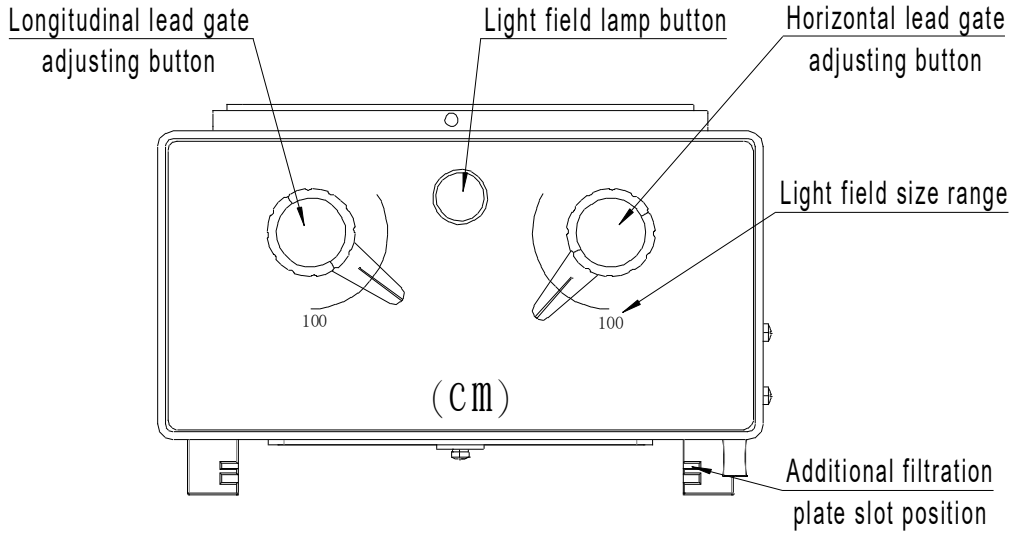
1.3 Collimator

1.3.1 Usage

Collimator, light flied continuous adjusting device attached to medical diagnostic X-ray

tube assembly, is used to adjust and limit irradiation field of X-ray and can improve radiography quality and reduce radiation dosage of X-ray to operator and the patient.

1.3.2 Basic structure



The appearance of collimator, the components of the collimator refer to the above figure.

1.3.3 Technical parameter

a) Light field lamp model: LED lamp.

b) When the light field lamp is on, the maximum automatic time limit is half a minute.

c) Inherent filtration of collimator: 1.2mmAl.

d) Weight of collimator: 4.5kg.

e) Additional filter plate: 0.1mmCu.

1.3.4 Application

a) Collimator is connected to the X-ray tube assembly through a connecting ring and fixed with screws; The adjustment knob can drive the horizontal and vertical lead blades to open and close, in order to adjust the X-ray radiation field.

b) The area of radiation field is displayed by the area lightened by light field lamp of the collimator. Turn the adjusting knob to enlarge the opening of lead leaf within the light field dimension shown on the panel; turning the two knobs in the opposite direction, the opening of lead leaf will be reduced. Therefore, it can satisfy radiography requirements of dimensions and division.

c) Aviation socket on the collimator is used for connecting power supply. Before using, it shall be well connected and plugged. Press the light field lamp button to start up collimator’s light field lamp. It will be off automatically after a lapse of about half a minute.

1.3.5 Install

Put the collimator on to the connecting ring of X-ray tube assembly, screw it by four set screws, and please pay attention to the soundness of the component, in case of fall down of collimator.

1.3.6 Debug

The collimator has been debugged before leaving the factory. Further adjustment shall be made after installation and before using to avoid any error resulting from improper installation. The debugging methods are as follows:

a) When connect the collimator with the X-ray tube assembly, please make the X-ray mouth toward the ground, put the FPD under it, adjust the SID to 100cm.

b) Put one piece of scale copper on the center position of FPD, light up the collimator, adjust the light field cover the center of scale copper, adjust the range of view to be 18cm*14cm, it is equal to the size of internal rectangle of the scale copper.

c) Low dose exposure;

d) Read the film, check if the center of radiation field on film is cover the center of scale copper and check if the size of radiation field and light field accord with the international standard.

e) In case of any abnormal, adjust the position of the LED lamp, take off the back pack, adjust the fixed M3 screw of lamp base, adjust the light field to make it overlap with the center of X-ray field, exposure after fix it, this step need several adjustment to achieve the ideal result.

1.4 X-ray source assembly

1.4.1 Target angle: 15°

1.4.2 Datum axis: passing through perpendicular bisector of X-ray source assembly window

1.4.3 Angle between target surface and datum axis: 15°

1.4.4 Tolerance of focal spot and datum axis: <1mm

1.4.5 Focus: 0.6/1.8

1.4.6 Equivalent inherent filtration: ≥2.5mmAl

2. Main Electrical Parameters

2.1 Max output power and X-ray tube voltage and X-ray tube current:

a) Max output power: 5kW

b) X-ray tube voltage: 50kV

c) X-ray tube current: 100mA

d) maximum rated capacity: 50kV, 250mAs

2.2 Nominal output power and X-ray tube voltage and X-ray tube current:

Nominal output power: 4kW (100kV, 40mA, 0.1s).

2.3 Nominal tube voltage and the corresponding max tube current: 120kV, 25mA.

2.4 Nominal tube current and the corresponding max tube voltage: 100mA, 50kV.

3. Loading Factors

3.1 The adjust range of tube voltage is 40kV~120kV, continuous adjust, 1kV step length. The deviation ≤8%.

3.2 The adjust range of mAs is 1.0mAs~250mAs, 49 steps can be divided:

1.0, 1.1, 1.25, 1.4, 1.6, 1.8, 2.0, 2.2, 2.5, 2.8, 3.2, 3.6, 4.0, 4.5, 5.0, 5.6, 6.3, 7.1, 8.0, 9.0, 10, 11, 12.5, 14, 16, 18, 20, 22, 25, 28, 32, 36, 40, 45, 50, 56, 63, 71, 80, 90, 100, 110, 125, 140, 160, 180, 200, 220, 250 mAs. The deviation ≤±(10%＋0.2mAs).

3.3 Loading factor combination table

kV adjust range	Tube current	Maximum loading mAs
40kV~50kV	100mA	250mAs
51kV~60kV	80mA	140mAs
61kV~70kV	56mA	125mAs
71kV~80kV	50mA	110mAs
81kV~90kV	45mA	100mAs
91kV~100kV	40mA	80mAs
101kV~110kV	32mA	63mAs
111kV~120kV	25mA	50mAs

3.4 Attenuation of X-ray when using accessories

There is no attenuation between the patient and the FPD in the X-ray beam path of this product. If other accessories (such as filter grid) are used, it will cause attenuation of the

X-ray beam, and the loading factor should be considered to be increased during the photography operation.

4. Range of Mechanical Motion

a) The minimum distance between the focus of the X-ray tube assembly (with its window downward) and the floor is not greater than 500mm, and the maximum is not less than 1750mm. Within the range mentioned above, the tube assembly can keep balance and brake reliably at any position.

b) The rotation of X-ray tube assembly around the arm shall not be less than ±90° and around its own axis shall not be less than 90°.

c) Collimator rotates on the vertical direction ±(90°±5°).

5. Source Image Distance (SID)

a) The recommend range of SID: 500~1800 (mm)

b) SID is adjustable, pull the rule (2m) in the beam limiter to the image receiving surface and the value displayed is SID.

c) Move the X-ray source assembly to make the SID be 1m long, the X-ray field after getting through the collimator is 430mm*430mm. Adjust the hand wheel of the collimator, it can show different rectangles, however the areas are not larger than 430mm*430mm. The longer the SID, the larger the X-ray area. When taking normal radiography, larger SID is better, and meanwhile, keep the patient as close as possible to the flat panel detector.

6. Flat Panel Detector

6.1 Effective imaging area: 430mm*430mm.

6.2 Spatial resolution (25mmAl attenuated phantom): not less than 2.8 lp/mm.

6.3 Detective Quantum Efficiency (DQE)

Radiation	Spatial resolution	DQE horizontal or vertical
2.5μGY@RQA5	0 lp/mm	≥60%
	0.5 lp/mm	≥48%
	1.0 lp/mm	≥43%
	1.5 lp/mm	≥36%
	2.0 lp/mm	≥30%

	2.5 lp/mm	≥22%
	3.0 lp/mm	≥15%
	3.5 lp/mm	≥9%

6.4 Precautions for using FPD

As the detector belongs to the complex and high-precision electronic medical equipment, please handle the detector with care! Prevent slipping during handling and hold the detector with both hands during carrying as collision, falling or strong shaking may damage the equipment.

When using the detector, always keep the device on a flat surface, otherwise, the equipment may be damaged by particles below or uneven surface.

The working temperature range of the detector is 5~35℃, and the working humidity range of the detector is 30~75%RH (@25℃). Inconformity of specified working environment will degrade the detector’s performance, and even result in irreparable damage!

Do not spill liquid or chemical onto the detector surface as liquid spillage may cause electric shock! In case of patient injury, a disposable sterile protective cover shall be used to separate the detector from the patient, then the detector can avoid direct contact with blood or other body fluids.

For more detailed precautions, please refer to the relevant detector’s operation manual.

7. Dimension

Maximum external dimension in mobile state: 145cm*65cm*135cm

8. Weight

Net Weight: 155kg

9. Dose determination indication

9.1 Position of indication

This product provides an indication of the dose area product for each exposure, as well as an indication of the cumulative dose area product generated by photography since the last reset operation. It is located below the touch screen LCD screen, where the single value and cumulative value are separated by a symbol slash (/).

9.2 Accuracy of indication values

The error between the indicated value and the measured value of the dose area product after a single exposure should not exceed 35%.

When the cumulative value of the dose area product exceeds 5 μGy•m^2, the error between the indicated value and the measured value should not exceed ±35%.

V. Install and Debug

1. Unpacking

1.1 When opening the box, place packing box on flat ground firstly. Tools which can be used for opening box include 8*10 open-end wrench or electric wrench, cotton glove, 8*200mm straight screwdriver.

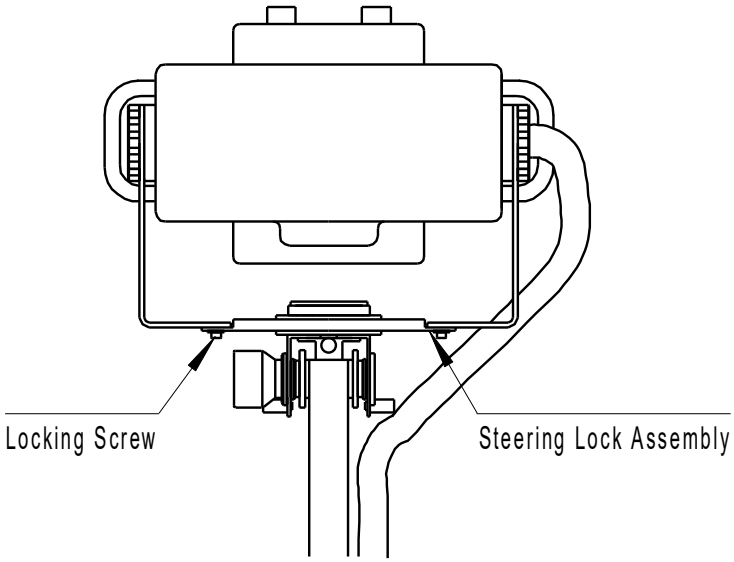
1.2 Wear cotton glove, unscrew bolts on upper cover plate of packing box, remove the nails by straight screwdriver and take down de upper cover plate (please careful there may be nails on the plate), open each side boards in order.

1.3 Unscrew bolts on back pedestal, then unscrew bolts on front pedestal, take the whole machine out.

2. The Installation and Disassembly

2.1 X-ray source assembly

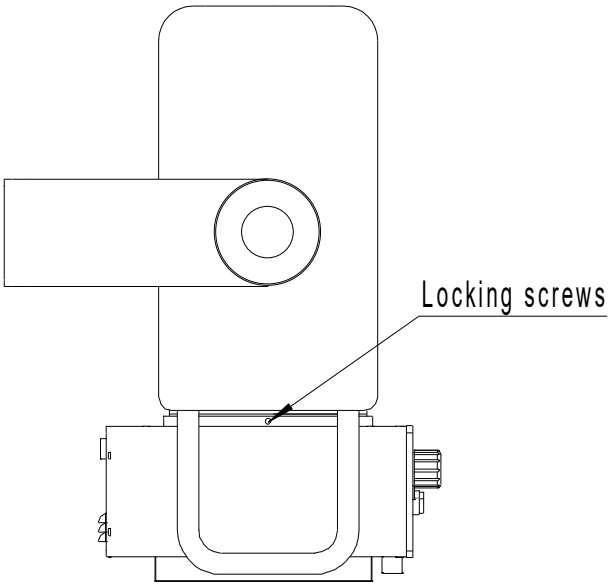
When installing the unit, fix the X-ray source assembly on the locking mechanism and lock it, and clip the hose into the hooks at the side of the rocking arm. Open the protective cover of the 24-core socket (refer to Figure below), and then connect the 24-pin head to its socket (Note: the end with the hose is on top), push it down and lock it by the side clips. The connection of the X-ray source assembly and the equipment finishes. When disassemble the unit, firstly, pull out and release the clips, and take off the 24-pin head, then take the hose out of the hooks at the side of the rocking arm, and then loosen the locking mechanism and take off the X-ray source assembly, and at last, put it back into the packing box.



X-ray source assembly top view

2.2 Collimator

Loosen the four locking screws around the flange of the collimator to remove it from the outer window of the X-ray tube assembly.



To install the collimator, follow the above method in reverse.

2.3 Power line

When installing the unit, insert the plug of the power cable into the electricity – inputting socket. Please note: the groove of the plug is upward and it corresponds to the plug, please insert the plug in the correct way, or you cannot insert it in the socket. Then tighten the fixed nail-cover of the plug; insert the 3-pin plug of the power cable into the net electricity source after all the parts have been well connected. When disassembling the

unit, pull out the power cable first to disconnect it with the net electricity source, then screw off the fixed nail-cover and draw it out, and roll it up and put it back into the packing box.

2.4 Hand Control Switch

When installing the unit, insert the plug of the hand-switch into the hand-switch socket. Note: please insert the plug in the correct way, or you cannot insert it into the socket. Then tighten the fixed nail-cover. When knocking down the units, loose the fixed nail-cover and draw it out, roll it up and put it into the packing box.

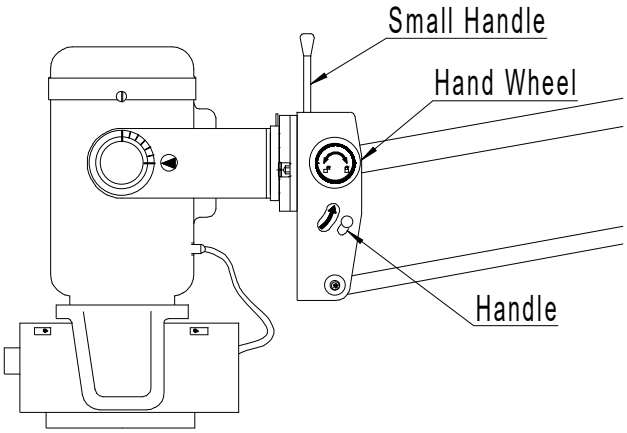
2.5 Grounding Cable (yellow-green wires)

When installing the unit, screw off the nut in the outboard of the grounding mark, and connect one end of the grounding cable to it through the stud, then tighten the nut, and then connect the other end to the protective ground of the room. When disassembling the unit, screw off the nut, take off the grounding cable and tighten the nut, then separate the other end from the protective ground. At last, roll it up and put it into the packing box.

3. Movement and Adjustment of the X-ray Source Assembly

3.1 Move X-ray source assembly

When the X-ray source assembly at the lowest position, presses down X-ray source assembly by hand gently, and turn the handles towards the direction as the arrow show. (Refer to Figure below) Then, the X-ray source assembly will be elevated, moving freely up and down and keep balance. (Note: handles is the switch of the safety mechanism. It is enabling to move the X-ray source assembly if it is not elevated.) When the X-ray source assembly reaches the lowest position during its downward movement, and it been blocked when it move upward, one possible reason is the handle is been locked by safety mechanism again. Act as above statements, the X-ray source assembly will recover by pulling the handles upward to the standard position by hand.



Position of the Handle

3.2 Movement Range of the X-ray source assembly

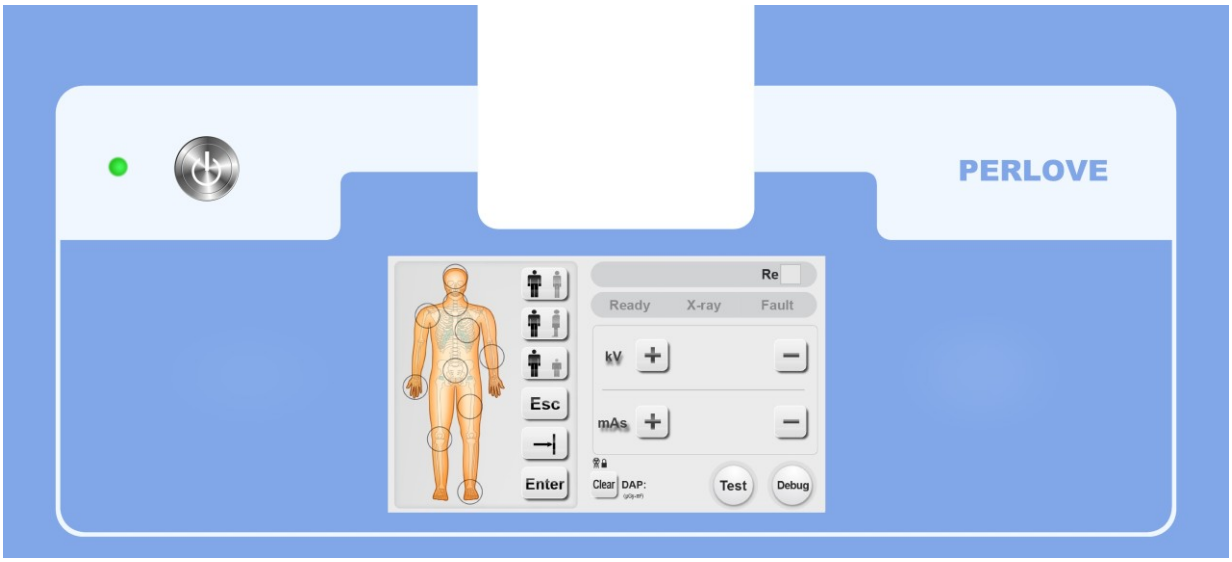
3.2.1 The X-ray source assembly moves up and down with the support arm, and the brake is reliable within the range. When it needs to be fixed at a certain point, it can be screwed with the hand wheel in the figure above. The whole machine is driven flexibly and equipped with brake device.

3.2.2 Loose the small handle in Figure above and the X-ray source assembly can make horizontal rotating around the datum axis ±90°.

3.2.3 The X-ray source assembly can make longitudinal rotating around the datum axis 90°.

4. Whole Machine Debugging

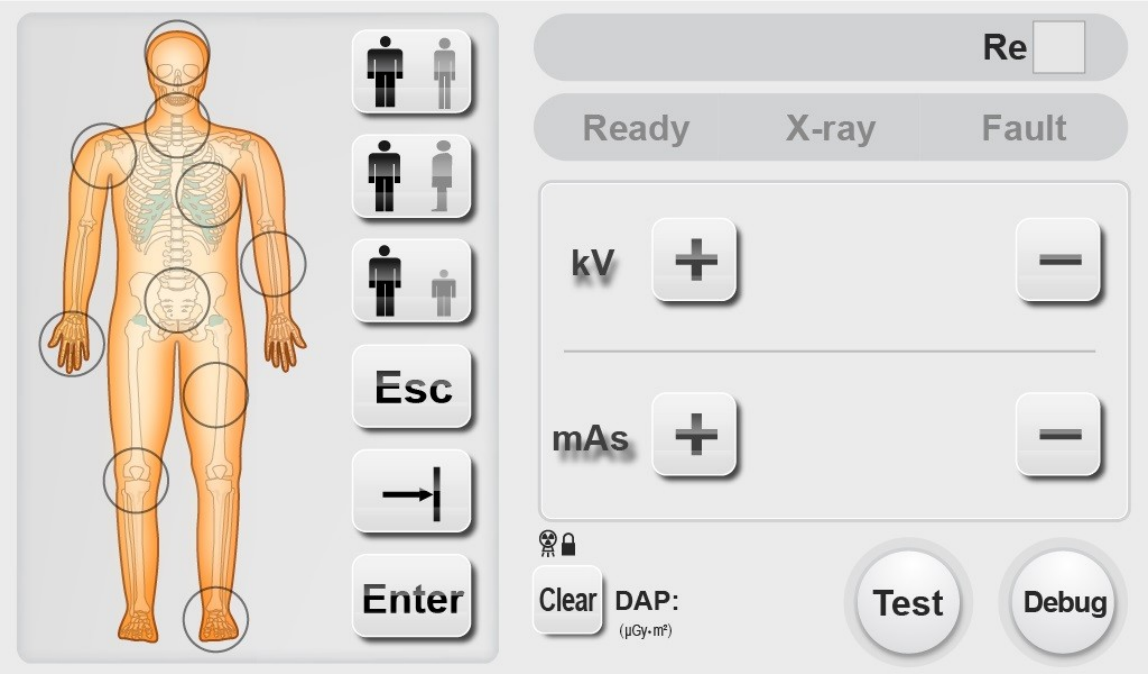
4.1 Control panel



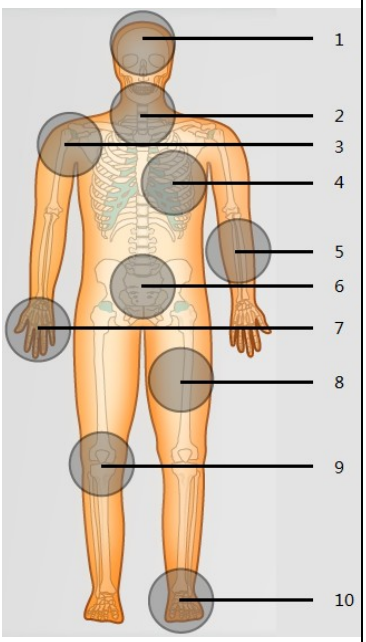
In the middle of the control panel is a touch LCD, and the upper left is a switch button and a power indicator.

4.2 Basic interface

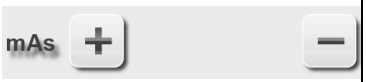
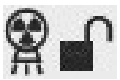
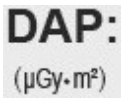
4.2.1 Put the circuit breaker in the on position, turn on the power, and the switch button will be on. Press the switch button, the machine will start and self check. After self inspection, the basic interface of LCD is as follows:



4.2.2 Key description of basic interface

	This area is the selection area of human body parts. It can be selected in combination with human body position. The ray parameters can be quickly selected. The unselected area of human body parts is completely transparent in the circle. After selection, it becomes dark transparent. Only one of the body parts can be selected. 1) Body part - head 2) Body part - spondyle 3) Body part - shoulder blade 4) Body part - cardiopulmonary 5) Body part - elbow 6) Body part - abdomen 7) Body part - hand 8) Body part - crotch

	9) Body part - leg 10) Body part - foot
	This area is the body position selection area, which can be matched with the body parts to select the ray parameters quickly. From the top to the bottom, they are: human characteristics - fat and thin; human body position - positive position and lateral position; human characteristics - adult and child.
	Cancel key. In the preparation state, if you want to cancel the preparation state, press this key to cancel the preparation state. At the same time, the press effect of "Enter" will be cancelled. If the preparation completion symbol is on, the original state will be restored at the same time. When the save key is pressed and the confirm key is not pressed, if you want to cancel saving, you can press the key to cancel saving. At this time, the effect of pressing the save key will be cancelled.
	Save key. You can save the current parameters under the current human body part features, press the key to enter the saving state, and the key has the effect of pressing. At this time, press the confirm key to save the parameters, and the key will flash continuously to prompt that the parameters are saved successfully.
	Prepare / confirm key. After the parameters are set, press the key to enter the ready state, and the key will have the press effect. After preparation, the indicator light of preparation is on, at this time, the exposure can be made by hand switch.
	Number of exposures remaining. After the machine is turned on, the full indicator bar is 5 times. The number of times that the currently selected parameter can be exposed will be calculated according to the current heat capacity, exposure

	parameters and rest time.
	Ready indicator. After the preparation is completed, the symbol turns green  , indicating that the preparation is completed and can be exposed.
	Exposure indicator. After pressing the hand switch, the symbol will turn yellow  when the ray is out, and the buzzer will sound for a long time, indicating that the exposure is in progress. After the exposure is completed or the hand switch is released in advance, the buzzer will ring twice after the long beep stops, and the symbol will be restored.
	Fault indicator. When there is a fault in the system, the symbol will be on, turn red  , the buzzer will beep for a long time, and the fault code will be displayed on the page.
	This area is the adjustment of the ray parameter kV, the "+" key is to increase kV, the "-" key is to decrease kV, which can be adjusted continuously by pressing and holding.
	This area is the adjustment of the ray parameter mAs, the "+" key is to increase mAs, and the "-" key is to decrease mAs, which can be continuously adjusted by pressing and holding.
	Ray lock. At this time, it is in the closed state (the key of the ray lock is in the OFF position), and cannot enter the ready state through the "Enter" key. Pressing the hand switch will not generate X-rays, thus avoiding accidental triggering of X-rays. When the key of the radiation lock is turned to the ON position, the icon changes to  and normal exposure can be achieved.
	Dose Area Product (DAP) indication, in units of μGy•m^2. The dose area product of a single exposure and the cumulative dose area product generated by photography since the last

	reset operation will be displayed after the symbol, separated by a slash (/) in the middle.
	Accumulated dose area product reset button. Press this button to reset the cumulative dose area product value.
	TEST key. Press this key, the machine will enter the training tube control panel.
	Reserved key.

5. Stability Test of Flat Panel Detector

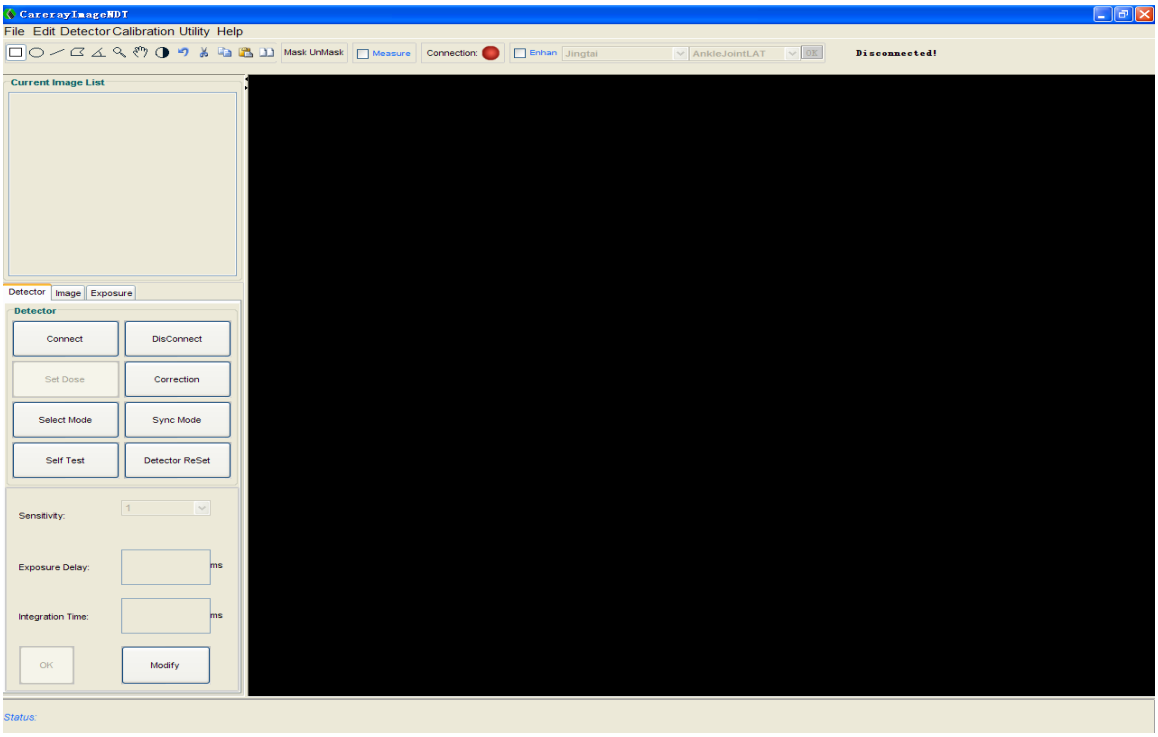
5.1 Test frequency

The stability test shall be conducted at least once a year since the machine is used.

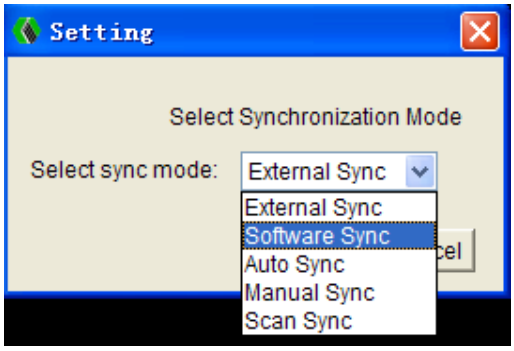
5.2 Test procedure

a) Start calibration

Prepare the X-ray system and start the CarerayImageNDT Vx.x.exe application in the installation directory, as shown in the following figure.

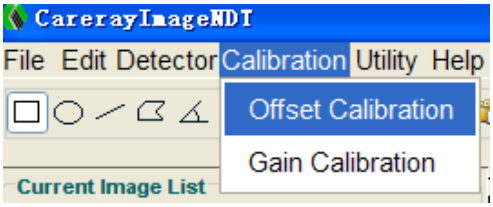


Click the "Sync Mode" button, and select "Software Sync" in the pop-up window, as shown below.

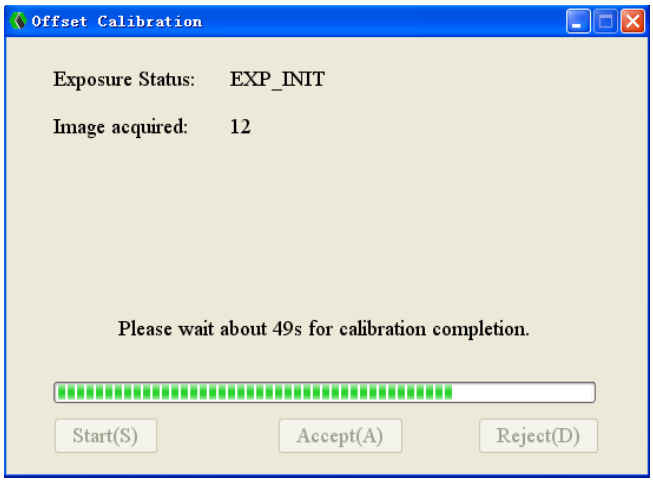


Click "OK" and the flat panel detector acquisition mode is set. Click the correction button and select the correction mode "Portable Corr", as shown below.

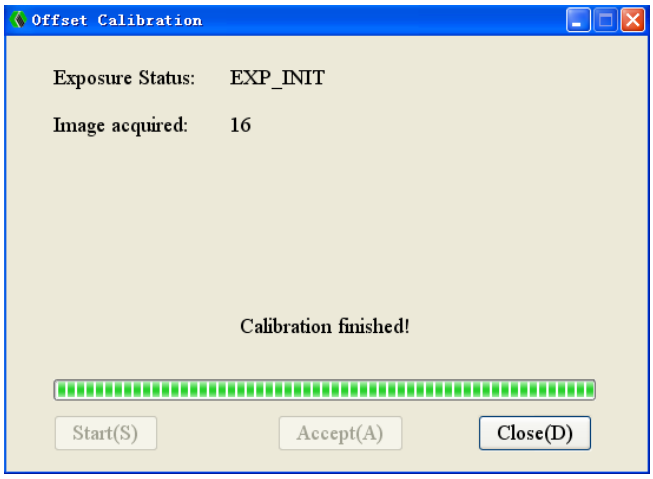
b) Click the "Calibration" item in the menu bar to pop up the submenu as shown below.



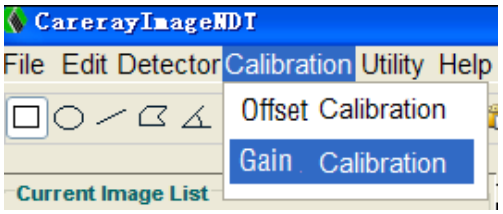
Select “Offset Calibration”, press start button in the pop-up window, as shown below.



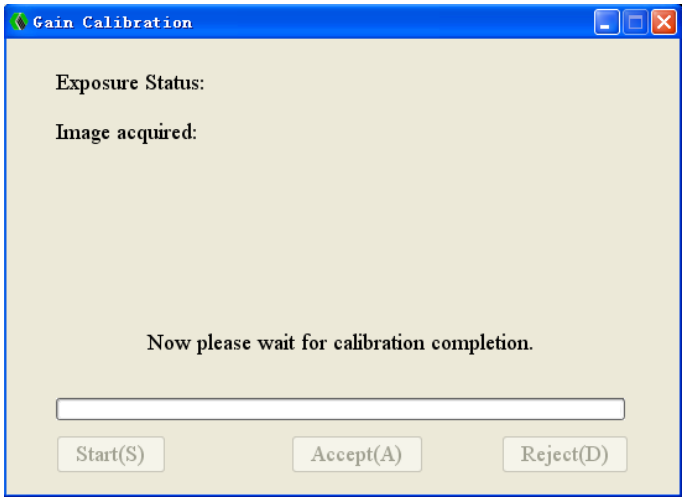
The flat panel detector conducts automatic dark field correction, just wait for its completion, as shown below.



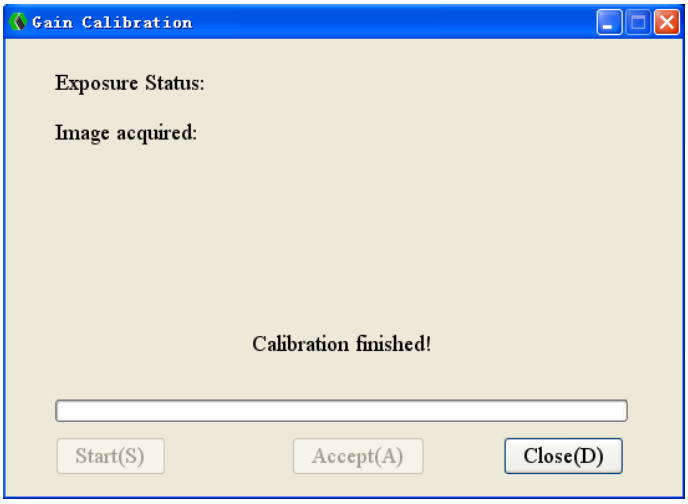
c) Click the “Gain Calibration” item under the “Calibration” menu, as shown below.



The correction page pop up as shown below. Enter “Gain Calibration”.



Wait a moment, after the correction is completed, as shown in the figure below, “CareImageNDT” automatically generates the correction file and deletes the original collected correction file.



Close the correction program “CareImageNDT” after the correction is finished.

d) After the calibration is successful, please delete the “ CareRayCalImgs” folder in the directory where CareCalibration.exe is located, and set the “CareCorrectFile” in detector selection [DETECTOR] in configuration setup.ini in the directory " C:\Program Files\perlong\PLX5100\DrWorkStation\config " to 1. Thus the calibration is completed.

6. DAP verification

a) Before using DAP, please click the button 

to reset the accumulated DAP to zero.

b) Conduct an exposure test to observe whether the DAP values are displayed normally and whether the accumulated DAP values are accumulated normally.

c) If you cannot use it normally or feel that there is a significant deviation in DAP data, please contact our company or authorized professional maintenance personnel for calibration and repair.

VI. Operation of the Equipment

1. Preparation Before Start

Before moving the equipment, first place the X-ray source assembly at the lowest position and keep it in the self-locking state, then carefully push the equipment to the clinical position of the required photography, and step on the foot brake to fix the equipment. (Note: when pushing the equipment, if there are obstacles such as uneven road surface, threshold and elevator door, please press the pedal firmly to lift the front wheel of the equipment, so as to smoothly pass through the obstacles, otherwise the front wheel will be damaged.)

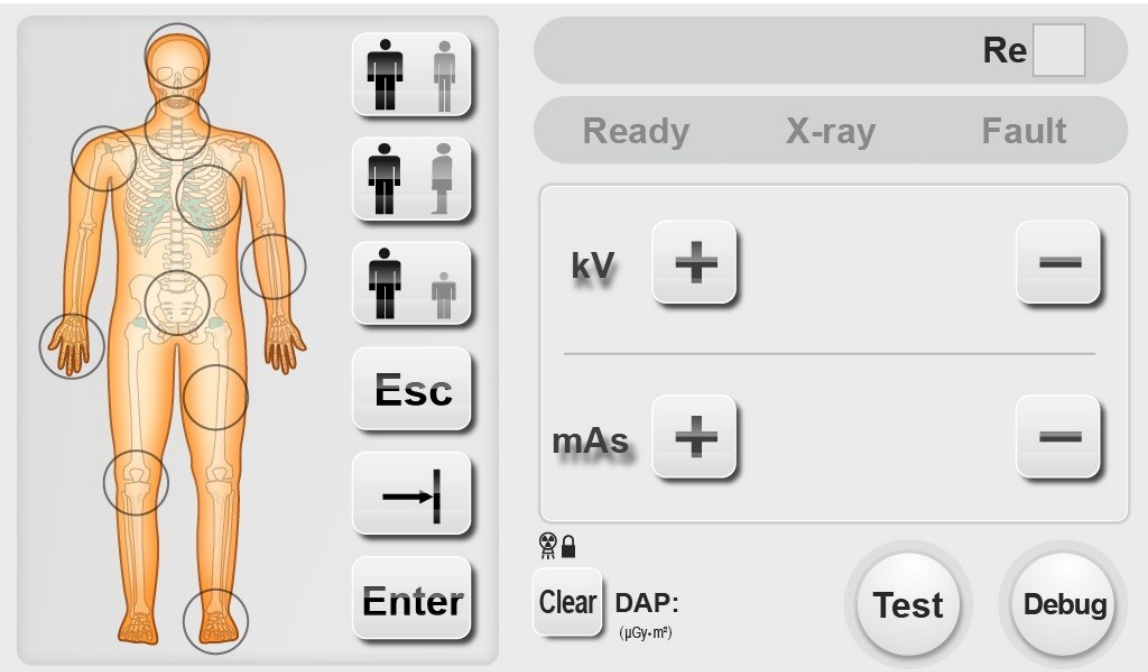
Press the X-ray source assembly down gently with your hand, and move the handle up (in the direction of the arrow) with your finger, then you can lift the X-ray source assembly to the required height, and maintain the balance. Remind again: the handle is the switch of the safety mechanism. Without lifting it up, the X-ray source component cannot move upward.

2. Start up

2.1 Connect power supply cable and protective grounding wire (yellow and green wires).

2.2 Adjust the X-ray source assembly and fix it at proper position. Place the FPD at certain parts of the patient to do photography.

2.3 Place the circuit breaker to the ON position, connect the power, and the power indicator light will be on. Press the switch button, the switch button will light up, the machine will start and self check. After the self check is completed, the LCD screen displays the following basic interface:



2.4 Parameters and remaining exposure times will be displayed according to the actual value.

3. Photography

3.1 Adjusting the collimator: press the positioning-light switch button then open position-light; adjust button forward and backward or right and left according to X-ray size to get required radiation field.

3.2 According to the clinical requirements, the X-ray parameters can be adjusted by + and − keys corresponding to kV and mAs, and can be continuously adjusted by pressing and holding. The kV and mAs values can also be determined according to the table of human body parts and position parameters.

3.3 Press the confirm key Enter, the indicator Ready turns green Ready after a few seconds, indicating that the preparation is completed.

3.4 Press the hand switch to send out rays, X-ray turn yellow X-ray at the same time, and the buzzer will sound for a long time, indicating exposure.

3.5 When the set time is reached (or the hand switch is released in advance), the yellow X-ray will resume, the buzzer will sound twice, and the photography is over.

3.6 The human body part and position parameter table is only an example/starting point and should be replaced by a more specific protocol. Modification method: Select the human body characteristics, including body parts, body fat, body position, adult and child, adjust kV and mAs to the appropriate parameters, press the save button →|, and then press the confirm button Enter. At this time, the parameters are saved, and the save button →| will flash continuously to indicate successful parameter saving.

4. Image Processing

The software's functions cover the following aspects:

a) Information management: registration and storage, medical record query, modification, remote query and registration, reporting, saving, preview;

b) Image post-processing: processing, single window, double window, four window, window width and level, region of interest, rotation 90 degrees, horizontal mirroring, vertical mirroring, movement, reset, scaling, negative image;

c) Image storage and transmission: checking and printing film, detecting SCP services, sending files;

d) Image measurement and identification: measurement, advanced.

Please refer to the help file in the workstation software for details. Click the "Help" button on the main menu of the workstation software, or press the shortcut key "Ctrl+F1" to pop

up the workstation software help file.

5. Power Off

Press the switch button to shut down the machine; turn the circuit breaker to the off position to cut off the power supply.

6. Notes

6.1 In the middle of exposure, to stop exposure, release the hand switch.

6.2 When adjusting the collimator to get the required radiation area, half a minute after being energized, Collimator Lamp will automatically switch off power. If illumination is needed, turn on the Collimator Lamp again by pressing down the light switch in the collimator.

6.3 For pediatric photography, please select "child" from the human characteristics - adult and child. At this time, the radiation parameters are greatly reduced. See the table of human characteristics in the attached figure for details. At the same time, for pediatric photography, please place a higher additional filter such as 4 mmAl.

6.4 Press the confirmation key 

, after the indicator light is on, if the exposure is not pressed within 1 minute, the machine will automatically turn to the screen before confirmation. To expose, press the confirmation key 

again to enter the exposure preparation.

6.5 When the left, right or the right front parts are to be taken photos, do remember to loose the small handle showed in the figure firstly. Afterwards, turn the X-ray source assembly to the required position and lock the small handle showed in the figure. Under this circumstance, you can take photos for the left, right, or the right front parts.

6.6 When no exposure is expected, please turn the key of the radiation lock to the OFF position and remove the key to store it properly; At this time, the ray lock icon on the LCD screen interface is  , indicating that the Enter key cannot be used to enter the preparation state, and pressing the hand switch will not produce X-rays. When preparing for exposure, insert the radiation lock key and rotate it to the ON position. At this time, the ray lock icon on the LCD screen interface is  , indicating that normal exposure is possible.

6.7 Software precautions

6.7.1 Usage Restrictions

6.7.1.1 Requirements for Users

The target users should be medical staff related to the field of imaging, and their operations should undergo sufficient training.

6.7.1.2 All known limitations that users may encounter during use

Users need to select the corresponding combination of loading factors based on different human body types, including adult and child, body parts, body position, weight and thinness, etc.

For patients with extreme obesity or severe osteoporosis, there may be a decrease in image quality, especially in the thoracic and lumbar regions.

6.7.2 Input/Output Data Types

6.7.2.1 Input Data Type

Register patient information structure: Enter patient information through keyboard or LAN system.

DICOM image structure: The image data generated by the digital high-frequency mobile X-ray machine workstation software is input into the software system through a local area network.

Dose information: The lower computer transmits kV and mA modes to the PC software through a protocol.

6.7.2.2 Output Data Types

Alarm prompt: The display interface indicates a system malfunction.

Patient information: The display interface shows patient information.

Image information: The display interface reads image data and displays it on the software interface.

Dose information: The workstation software on the display interface displays kV and mA mode values.

6.7.3 Essential software and hardware

Essential hardware: laptop computer.

Essential software: WINDOWS 10 operating system.

6.74 Maximum concurrency

This software is only authorized for use by a single user and is only available for use by one end user on a single system.

6.7.5 Interface

The system uses DICOM 3.0 network protocol to transmit image data, and files are stored in DICOM 3.0 format. Connect the film printer through the DICOM3.0 protocol, connect to the file management center through the DICOM3.0 protocol, and connect to the RIS server through the DICOM3.0 protocol.

X-Ray device interface: Use standard RJ-45 interface to connect devices and transmit data based on standard TCP/IP communication protocol.

Interface for connecting printers: Connect to local or shared printer devices, set as the default printer, and this software will automatically connect to the default printer after startup.

6.7.6 Access Control

The system uses usernames and passwords to authenticate user identities, and user types are divided into administrators and regular users. Administrators can delete images and delete users.

6.7.7 Operating Environment

6.7.7.1 Hardware Configuration (Typical Configuration)

CPU: i5-1135G7

Memory: 8GB

Hard drive: 512GB

6.7.7.2 Software Environment

System software: Windows 10

6.7.7.3 Network conditions

Network type: Local Area Network

Bandwidth: 1Gbps

VII. Safety

1. General Description

The unit belongs to radiology unit and must only be used in compliance with the instructions indicated in this manual and must not be used for other purpose than medical radiography. The unit must only be used by personnel with the necessary knowledge in the field of radiation and with the necessary training in use of x-ray units. Take special notes of the following items when put the unit into operation:

a) The unit must not be used when there are any electrical and mechanical faults.

b) Must be assembled with ground connection (the yellow-green wire) when operating the unit.

c) Under no circumstances work in places saturated with vapor and/or flammable gases or explosives.

d) Any modification to the unit must be permitted by the manufacturer or its authorized service personnel.

e) Regular check and maintenance is necessary for the unit.

f) Operations must be performed according to the user's manual. Do not modify the system without permission.

2. Electrical Safety

2.1 Make sure the voltage, input power of the electric net and the inner resistance of the power supply that the unit is to be connected complies with the foreseen power supply requirements.

2.2 Before use, check whether the power cord, corrugated pipeline and other circuits are connected properly and whether there is any damage. If there is any damage, immediately contact our company for repair or replacement.

2.3 Please pull out the power plug when cleaning.

2.4 Power off and pull out the power plug after use.

2.5 The equipment has the function of thermal circuit protection, when the temperature in X-ray tube is higher than 45℃, it will turn-off automatically and reset after the temperature be normal.

3. Circuit Breaker

3.1 The instrument applies circuit breaker to ensure electrical safety. The model of circuit breaker is DZ47-60 D16, rated value is 16A.

3.2 Do not forcibly close the circuit breaker, if the circuit breaker turns off for the second time during use automatically. The correct method is: cut off the power supply immediately, then contact with us or specialist authorized by our company.

4. Mechanical Safety

Warning: The alarming plate on the machine's rocking arm specifies that:

a) Before mounting x-ray source assembly, you are not allowed to move the handles, otherwise the rocking arm will rebound and cause injury.

b) When there is no x-ray source assembly on the rocking arm, you are not allowed to move the handles, nor to forcibly move the rocking arm upwards, otherwise the rocking arm will rebound to cause machine damage and person injury.

c) When disassembling the x-ray source assembly, make sure the rocking arm is in the lowest position and a "click" from the handle is heard. Meanwhile, it is impossible to move the x-ray source assembly upward slightly. This indicates that the machine is in the self-locking state and the disassembling of the x-ray source assembly can be carried out.

SPECIAL DECLARATION: we take no responsibility for any injury to person that is resulted from violates these rules.

5. Protection against Radiation

5.1 Patient dosage

5.1.1 Skin dose level

The skin dose level during normal use may be high enough to cause deterministic effects. The available selection settings have a significant impact on radiation quality, transmitted radiation dose, and imaging quality.

5.1.2 Patient Incident Reference Point

The specific kinetic energy of air indicates the radiation dose at the reference point of the patient's incidence, measured in Gy. The reference point for patient incidence of this product is located 40cm away from the focal point along the central axis of the X-ray

beam.

5.1.3 Radiation data

Measure at the patient's reference point of incidence. The following dose test data are typical values under normal usage conditions. There may be certain deviations in actual use.

Mode	Parameter	No grid No add filter	No grid Add filter 1mmAl	No grid Add filter 2mmAl
Radiography (Add 20cm PMMA)	kV	80	80	80
	mA	20	20	20
	Dose (mGy)	1.78	1.01	0.79
Radiography (Max.)	kV	50	50	50
	mA	250	250	250
	Dose (mGy)	12.47	9.66	7.67

Note: PMMA is polymethyl methacrylate, and 20cm PMMA is the standard test phantom.

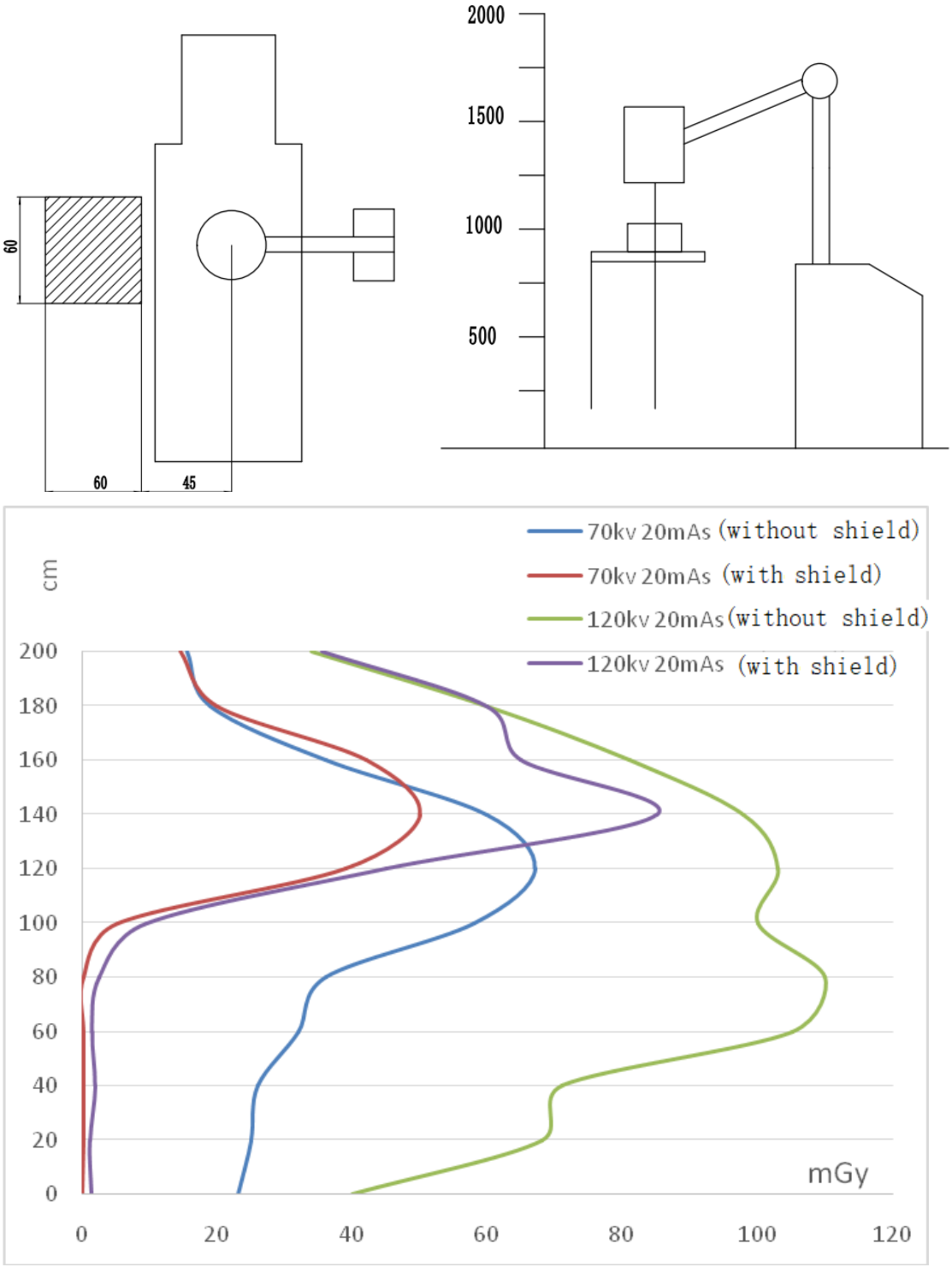
5.2 Precautions

It is necessary to limit the contact and use of equipment in accordance with China's radiation protection laws and regulations. Please remember the following precautions:

a) Minimize the time spent in the X-ray area as much as possible. Stay as far away from the X-ray source as possible.

b) When performing pediatric photography, please select children from the human body characteristics - adults and children. At this time, the radiation parameters are greatly reduced, as shown in the human body characteristic parameter table in the attached figure. At the same time, pediatric photography should not use filter grids and should place higher additional filters.

c) During the operation, the operator should take necessary radiation protection measures: use protective equipment such as protective clothing, goggles, gloves, helmets, etc., and conduct X-ray exposure in the effective occupied area (see figure below) to maximize X-ray protection measures.



d) Try to increase the total filtration as much as possible. The radiation dose of a patient is inversely proportional to the square of the focal skin distance. In order to reduce the radiation dose to patients, the focal distance should be as large as possible, and patients should be as close to the image receiving surface as possible. The equipment should be equipped with a device to prevent the focal distance from being less than 20cm. Use low-dose exposure as much as possible.

e) Avoid exposure of pregnant women and infants to X-rays; If inspection is necessary, special expert plans need to be considered to reduce radiation dose and take protective measures for areas outside of radiation, such as covering with lead clothing.

f) When the patient's glasses, removable dentures, watch, hair clip, etc. may enter the photography range, they should be removed to avoid creating false images.

6. EMC

6.1 Declaration

This equipment meets the requirements of EMC standard for medical equipment in YY 9706.102-2021.

This equipment will produce, use and radiate RF energy.

This equipment may cause radio disturbance to other medical equipment, non-medical equipment and telecommunication. In order to prevent this disturb, this equipment complies with radiation limit for Group I, Class A Medical Devices in YY 9706.102-2021. However, we do not promise that this equipment do not disturb other special devices.

6.1.1 Basic performance

● Adjust load factors to normal, radiography is available

● Imaging normally with no artifacts or distortion interfering with diagnosis

● Do not has unexpected or uncontrolled alarm or failure.

The use of accessories, transducers, cables and other components made by non equipment manufacturers can lead to the increase of radio frequency emission, or cause the performance of this equipment to weaken. All connections of the peripherals must be shielded and grounded correctly. The use of no shielded or grounded connections may lead to radio frequency interference by the device.

The manufacturer is irresponsible for the use of an unauthorized connection or unauthorized change or modification of the equipment. If the user has made unauthorized changes or modifications, we may cancel the qualification of its operating equipment.

6.1.2 Equipment information

The PLX5100 is suitable for all non household facilities, as well as all facilities that are not directly connected to the public low voltage grid.

The compatible accessories must be applied to the operating conditions recommended in the manual. Except for debugging and preheating, other equipment must be reset before and after use to ensure accurate measurement. Continuous exposure of the electromagnetic area (over test conditions) may lead to error diagnosis. Failure to comply with the recommendations may result in foggy diagnosis. Electromagnetic interference can be caused by the electromagnetic area environment produced by the nearby MRI equipment.

The above equipment typically installs EMC for this purpose.

6.2 Compatibility table

This equipment meets the requirements of EMC standard for medical equipment in YY 9706.102-2021.

According to the limitation and advice in table below, PLX5100 is available in electromagnetic environment as described below.

● Electromagnetic emissions (table 1)

● Electromagnetic immunity (table 2 and table 3)

●The minimum recommended distance of portable/movable RF communication instrument and this equipment (table 4)

Together with the matched cable, this system accord with the requirement of EMC. If you need cables of different length, you can connect with the qualified after-sales representatives.

6.2.1 Guidance and Manufacturer declaration-electromagnetic emissions.

The customer or user of the PLX5100 should ensure that the equipment is used in the following electromagnetic environment.

Table 1 Electromagnetic emission

Item	Conform		Electromagnetic environment	Remarks
	Test standard	YY 9706.102 level requirements		
Radiofrequency emission	GB4824	Group I, Class A	PLX5100 uses radiofrequency energy only for its internal functions, so its radiofrequency emission is very low, and it is unlikely to cause any interference to the nearby electronic devices. PLX5100 is suitable for all non household	

			facilities, as well as all facilities that are not directly connected to the public low voltage power grid (for household power supply).	
Harmonic distortion	GB/T 17625-1 IEC 61000-3-2	inapplicability	The PLX5100 power supply system is not connected to the residential low voltage power supply network by non household and not directly connected to the residential low voltage power supply network, and it will not interfere with the residential electricity.	
Voltage fluctuation and flicker	GB/T 17625-2 IEC 61000-3-3,11	inapplicability	The PLX5100 power supply system is not connected to the residential low voltage power supply network by non household and not directly connected to the residential low voltage power supply network, and it will not interfere with the residential electricity.	

6.2.2 Guidance and Manufacturer declaration-electromagnetic immunity

According to the test method of YY 9706.102, in the immunity type test simulated in the laboratory, the essential performance of the system was unaffected and no artifact or ghost, no unexpected movement, no communication outage or false alarm arose.

Table 2 Electromagnetic immunity

Item	Test level		Conforming to the level	Remarks
	Test standard	YY 9706.102 level requirements		
Electrostatic discharge immunity	GB/T 17626-2 IEC 61000-4-2	±8kV air	±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
		±6Kv contact	±6kV contact	
Anti disturbance of electric rapid transient pulse group	GB/T 17626-4 IEC 61000-4-4	±2kV for power supply lines	±2kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
		±1kV for input/output lines(less than 3 meters not applicable)	±1kV for input/output lines	
Surge	GB/T 17626-5	±2kV line(s) to line(s)	±2kV line(s) to line(s)	The quality of power

Item	Test level		Conforming to the level	Remarks
	Test standard	YY 9706.102 level requirements		
protection immunity	IEC 61000-4-5	±1kV line(s) to line(s)	±1kV line(s) to line(s)	should be standard commercial or medical use power
Voltage sags and interruption immunity	GB/T 17626-11 IEC 61000-4-11	<5%U_T, (>95% dip in U_T) for 0.5 cycle 40%U_T, (60% dip in U_T) for 5 cycle 70%U_T(30% dip in U_T) for 25 cycle <5%U_T, (>95%% dip in U_T) for 5 s	—— <5%U_T, (>95%% dip in U_T) for 5 s	The quality of the network power supply should be the typical commercial or hospital power environment quality. If the user needs to continue to work during the network power interruption, it is recommended to use uninterrupted power or battery.

Note: the above is only the type of test data, the actual situation may be changed.

Table 3 Electromagnetic immunity

Item	Test level		Conforming to the level	Remarks
	Test standard	YY 9706.102 level requirements		
Transmission harassment of radio frequency field induction	GB/T 17626-6 IEC 61000-4-6	150KHz-80MHz 3V (effective value)	150KHz-80MHz 3V (effective value)	The portable and mobile radio frequency communication equipment and any part of PLX5100 (including cable) should not be less than the recommended interval distance calculated according to the following formula. Recommended separation distance: $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$，80MHz至800MHz $d=2.3\sqrt{P}$，800MHz至2.5GHz Attention: P is the maximum output power rating of the transmitter of watts (W) according to the transmitter manufacturer. D is the recommended separation distance in meters (m) Field strengths from fixed RF transmitters, as determined by an electromagnetic site
radiated susceptibility	GB/T 17626-3 IEC 61000-4-3	80MHz-2.5GHz 3V/m	80MHz-2.5GHz 3V/m	
Interference degree of power frequency magnetic field	GB/T 17626-8 IEC 61000-4-8	3A/m	3A/m	

Item	Test level		Conforming to the level	Remarks
	Test standard	YY 9706.102 level requirements		
				survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 

① Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy, to assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered, if the measured field strength in the location in which the PLX5100 is used exceeds the applicable RF compliance level above, the PLX5100 should be observed to verify normal operation, if abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the PLX5100.

② Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

③ These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

6.2.3 The recommended distance of electromagnetic immunity

The PLX5100 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the PLX5100 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF commutations equipment (transmitters) and the PLX5100 as recommended below, according to the maximum output power of the communications equipment.

Table 4 Recommended separation distances between portable and mobile RF communications equipment and the PLX5100

power rating of transmitter (W)	Minimum distance according to frequency of transmitter (m)			Remarks
	150kHz~80MHz	80MHz~800MHz	800MHz~2.5GHz	
	$d=1.2\sqrt{P}$	$d=1.2\sqrt{P}$	$d=2.3\sqrt{P}$	
0.01	0.12	0.12	0.23	

0.1	0.38	0.38	0.74	
1	1.2	1.2	2.3	
10	3.8	3.8	7.3	
100	12	12	23	

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

6.3 Suggestion of operation

This equipment accord with the requirement of EMC standard of medical equipment in YY 9706.102-2021, PLX5100 is suitable for the hospital.

PLX5100 should not be operated close or staked to other equipment, if necessary, operator should verify the normal work of the equipment.

Keep the recommended distance according to Table 4, and keep the frequency between 150 kHz and 2.5 GHz may reduce the interference on the image, however it is impossible to eliminate all of the disturbances. We can ensure that you can maintain the basic functions of this equipment and acquire steerable x-ray exposure continuously and safely based on this installation and operation requirements.

If you use other unspecified accessories like inverter or cable, it will result in the reduction of EMC of PLX5100.

The medical staffs that in charge of this equipment ought to direct technical person, patient and other people near the equipment to fully comply with the requirements above.

VIII. Troubleshooting

Fault phenomenon	**Reasons**	**Solution**
Press power button, no power supply input	Power socket has no power supply;	Check power socket
	Power wire break off	Check and repair the power wire
	Circuit breaker is at OFF location	Put the circuit breaker to ON location
	Electrical malfunction	Contact with us

No X-ray	The key of the ray lock is on the OFF position Malfunction of x-ray source assembly Electrical malfunction	Rotate the key of the ray lock to the ON position Contact with us Contact with us

If any abnormal things occur to the machine, turn off the machine and check the power supply, then, restart the machine. Please contact us if it still can't work normally.

IX. Maintenance

1. Maintenance Requirements

1.1 The equipment needs regular maintenance.

1.2 Wear and tear due to long-time usage of the equipment will reduce its safety level. To protect the patients or operators from being harmed, examination on the machine should be conducted regularly to check whether there is loosening or whether the braking devices are still reliable.

1.3 The equipment should be in the charge of specially assigned personnel and management archive should be field.

1.4 Operators should have received good training and can fulfill regular checking.

1.5 To prevent the spring from fatigue, the X-ray source assembly should be placed at the highest position when the equipment is unused.

2. Maintenance Periods

Time Interval	Items of Inspection
Daily checking	Check whether the signal, display and indicator light are normal; Check whether the switch works normally.
Weekly checking	Check whether the X-ray source assembly leaks oil; Check whether there is abnormal sound when exposure of X-ray source assembly.
Checking every six months	Check grounding resistance value of the complete machine (< 0.1Ω); Check whether there is any loosing suspicion of the fixing screws of the mechanical parts; Check the center of X-ray source assembly and collimator.

3. Cleaning and Sterilizing

To prevent it from being damaged, the equipment should not be cleaned by water if cleaning and sterilizing are needed to be conducted on the machine. When cleaning and sterilizing, turn off the power and then wipe the equipment with cotton fabric soaked with detergents or sterilized liquid. Attention: the panel should be wiped with cotton fabric soaked with clean water only instead of cleanser or disinfectant, otherwise the aging of panel will be accelerated.

4. Test

After the machine is installed, before use for the first time or when the machine has been out of use for more than 3 months, TEST must be conducted to clear away any possible gas existing in the x-ray tube.

a) Press the key 

on the LCD basic interface to enter the training tube control interface, as shown below:

b) Key introduction of training management control interface:

: Cancel key. In the preparation state, if you want to cancel the preparation state, press this key to cancel the preparation state. At the same time, the press effect of "Enter" will be cancelled. If the preparation completion symbol is on, the original state will be restored at the same time.

: Switch key of training management mode. 

is the automatic mode. Press the hand switch after the preparation is completed. The machine will automatically train the tube and stop after completion. 

is the manual mode, which stops after one exposure under the currently selected kV.

: Ready key. After the parameters are set, press the key to enter the ready state,

and the key will have the press effect. After preparation, the indicator light of preparation is on, at this time, the exposure can be made by hand switch.

: kV display. Displays the current kV value.

: KV add and subtract keys to increase or decrease the kV value.


: Status indicator. This symbol is on the left most side of the screen. There is no such symbol under normal conditions. The background color is displayed. After preparation, the blue on the top lights up, and the yellow in the middle lights up during exposure. Restore the background color after exposure.

c) Automatic training operation: switch training mode to automatic mode 

. Press the preparation key 

, the blue above the status indicator will light up; press the handle switch again, the machine will start to expose, and the yellow in the middle of the status indicator will light up; after one exposure, the status indicator will restore the background color. The machine automatically adjusts the kV value and repeats the process of preparation, exposure and completion. Until the end of pipe patrol on the screen, release the hand switch, and the automatic pipe training is completed.

d) Manual training operation: switch the training mode to manual mode 

. Adjust the kV value to 40kV through the kV addition and subtraction key, press the preparation key 

, and the blue above the status indicator will light up; then press the handle switch to start the exposure, and the yellow in the middle of the status indicator will light up; after the exposure, the status indicator will restore the background color. After one exposure, take a rest for about 1 minute, then adjust the kV value up step by step, increase 10kV each step, repeat the above operations of preparation, exposure and completion until the kV value increases to 100kV, and the manual training is completed.

X. Transportation and Storage

1. Transportation

1.1 Transit and protection should be well prepared according to the icons and/or symbols on the package box before transportation.

1.2 During transportation, if there is uneven or gravelly road present, the moving speed should not exceed 40km/h. The speed should be reduced further more if the road is found to be worse.

1.3 During transportation, especially the uneven roads, remember to check whether the equipment is loose. Watch out for any collision during transportation.

2. Storage

2.1 Environmental temperature: -20℃ ~ +55℃

2.2 Relative humidity: 10% ~ 100% (non-condensing)

2.3 Atmospheric pressure: 500hPa ~ 1060hPa

2.4 The unit must be settled in shadow, dry, moisture-guard and ventilated places. DO NOT put it in the open air.

XI. Disposal of the Rejected Machine

The service life of this equipment is 10 years. After 10 years of use, the equipment should be scrapped. After the equipment is scrapped, in order to achieve environmental protection goals, the transformer oil in the X-ray tube assembly should be recycled by industrial oil recycling department; and the rest should be disposed of according to the hospital's scrapping procedures.

XII. Quality Guarantee

1. Manufacturer’s Responsibility

The manufacturer is responsible for unit safety, reliability and performance related quality under the following circumstances:

a) All the installation, adjustment, changes and maintenance are conducted by our staff or the staff authorized by us.

b) The electric equipment used for this unit conforms to the technique requirements in this manual.

c) The operators are well-trained technicians and they strictly operate the unit according to the requirements in this manual.

2. Three Guarantees

a) Under the circumstance that the users abide by the terms and conditions mentioned above, we will repair the unit or replace the unit parts free of charge, even refund if the unit cannot work properly owing to quality reasons within one year from delivery.

b) If there is any damage resulted from ignorance of the above mentioned terms and conditions or the unit has expired the one-year guarantee period from delivery, we will repair or change the unit parts and accessories for users with moderate charge of the material and labor costs.

c) We are responsible for the regular maintenance of the unit with proper use within 10 years.

XIII. Appendix Figures

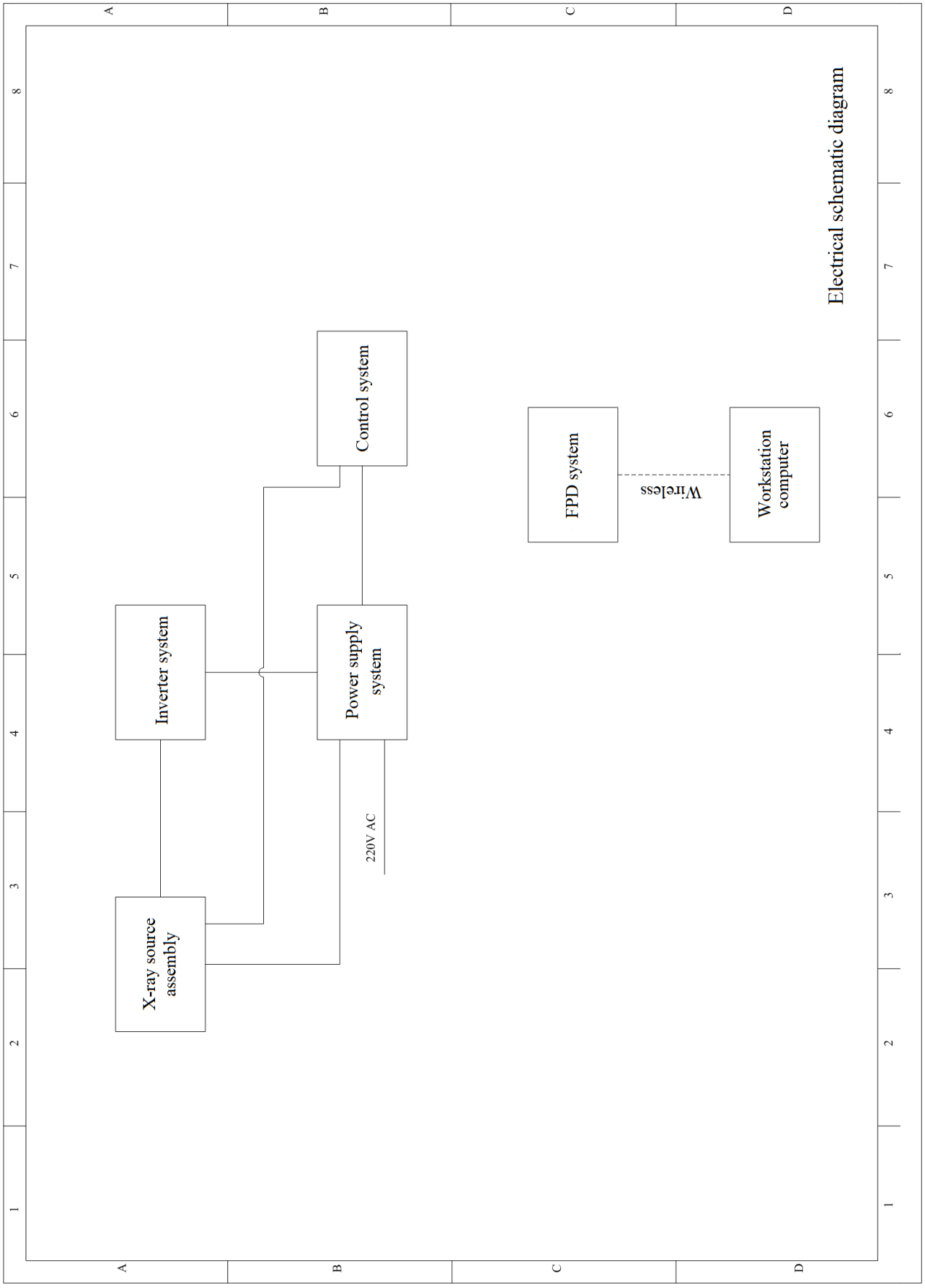
The following graphs are attached at the end of the manual:

a) Electrical schematic diagram

b) Human body parameter table (for your reference)

Note: After the purchase of the equipment, we ensure that we provide you with necessary information for equipment repair, provided that we have confirmed your technicians can repair the unit effectively.

a) Electrical schematic diagram



b) Human body parameter table

(For your reference only, the exact parameter setting needs to be judged by the situation of equipment, power condition and the condition of patient.)

parts	figure	adult				child			
		frontal position		lateral position		frontal position		lateral position	
		kV	mAs	kV	mAs	kV	mAs	kV	mAs
head	fat	78	40	65	28	75	32	62	35
	thin	75	32	60	25	70	32	60	25
spondyle	fat	75	14	78	16	65	10	65	10
	thin	73	16	73	16	60	10	60	10
shoulder blade	fat	78	18	78	18	68	12.5	65	12.5
	thin	73	16	73	16	65	12.5	65	12.5
cardiopulmonary	fat	78	20	85	25	70	16	75	20
	thin	75	14	80	20	65	12.5	70	16
lumbar	fat	85	45	90	63	70	28	75	32
	thin	80	32	85	40	65	22	70	28
arm	fat	60	10	60	10	55	7.1	55	7.1
	thin	56	8	56	8	52	7.1	52	7.1
hand	fat	58	8	58	8	55	6.3	55	6.3
	thin	56	8	56	8	52	7.1	52	7.1
leg	fat	65	14	65	14	58	10	58	10
	thin	60	12.5	60	12.5	58	10	58	10
knee	fat	60	12.5	60	12.5	55	10	55	10
	thin	58	12.5	58	12.5	53	10	53	10
foot	fat	55	10	60	10	50	8	55	10
	thin	55	8	60	10	50	5.6	50	5.6