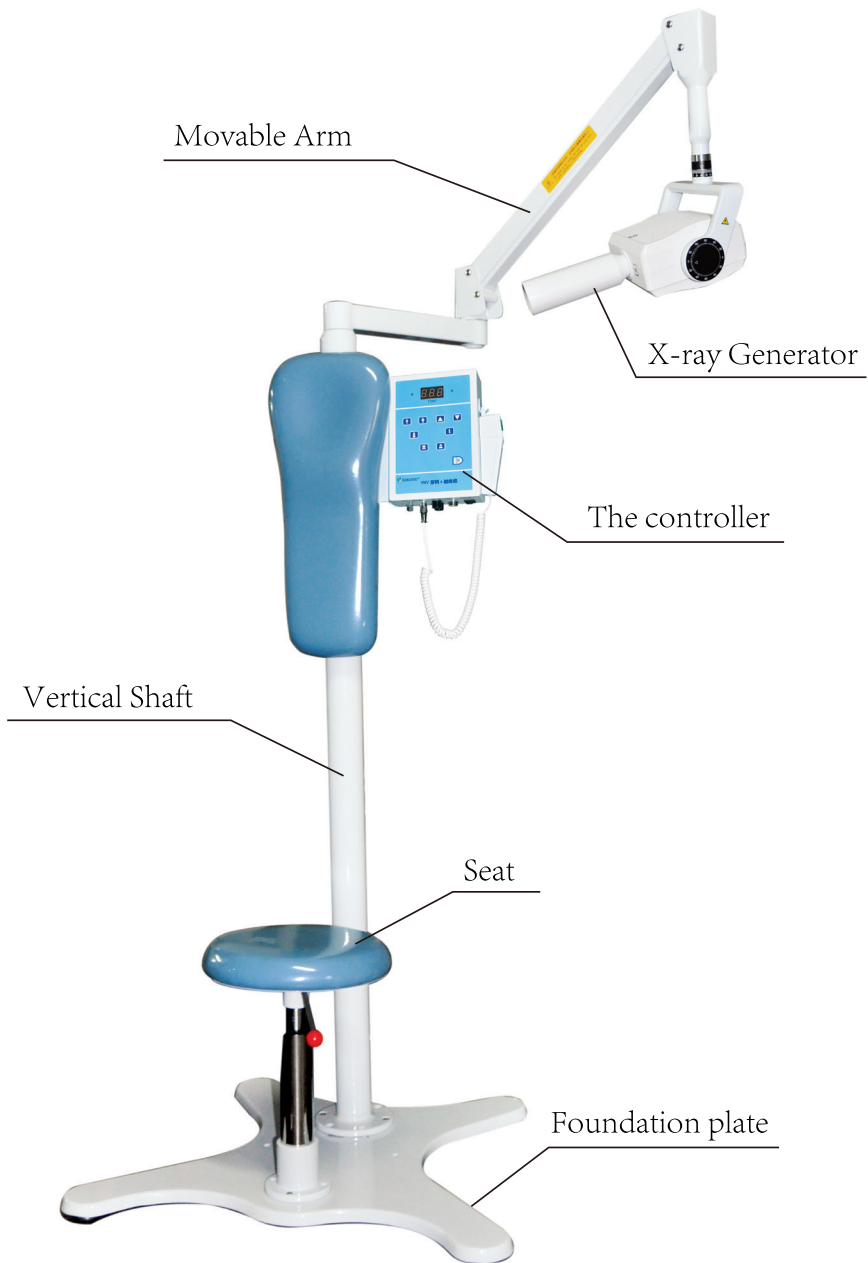


Dental X-Ray Unit

Manual





Movable Arm

X-ray Generator

The controller

Vertical Shaft

Seat

Foundation plate

PREFACE

You are welcome to select and use our dental X-ray unit. thank you. The manual introduce the technical specification. installation. usage. maintenance and attentions in detail. So please read the manual carefully before using the equipment.

Thanks for cooperation!

About the Symbol



Dangerous voltage



Protective earth



X-ray emitting




Caution

Chapter I Environmental Conditions

1.1 Environmental conditions

- ◆ Transportation and storage conditions:
 - Ambient temperature: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
 - Relative humidity: $\leq 75\%$
 - Atmospheric pressure: 50 Kpa \sim 106Kpa
- ◆ Working conditions:
 - Ambient temperature: $+10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 - Relative humidity: $\leq 75\%$
 - Atmospheric pressure : 70 Kpa \sim 106Kpa
- ◆ Power source conditions:
 - Single-Phase AC: $220\text{V} \pm 22\text{V}; 50\text{Hz} \pm 1\text{Hz}$
 - Power source capacity: $< 1.2\text{KVA}$

1.2 Safety and related symbols:

- ◆ Do not use or store the machine in inflammable areas
- ◆ Do not use or store the machine in the places where the values of the atmospheric
- ◆ Places where the machine is used or stored should be soundly-ventilated, avoiding direct sunshine radiation
- ◆ The machine must be earthed reliably for security The grounding symbol “” is attached near the earth terminal
- ◆ A beam tube is installed on the output window of X-ray to regulate the X-ray within the stipulated range

Chapter 2 Structure and Operational Principle

The structure of the X-ray unit is very simple. The whole equipment is composed of X-ray generator (X-ray tube head), controller and framework.

Operational principle: The single-phase AC current leads to the primary coil of the high voltage transformer, through the back voltage attenuator by the control circuit. The high voltage induced by the sub-level coil is supplied to the X-ray tube to generate X-ray.

The equipment has fixed values of tube voltage (KV), and tube current (mAs). The quantity of irradiation (mAs) is realized by changing exposure time.

Chapter3 Technical Parameters

3.1 Performance Index:

Tube Voltage:70KV \pm 10%

Tube Current:8mA \pm 20%

Exposure Time: 0.1~4.0s (equipped with up &down button)

Input Power: <1.2KVA

Maximum Output Power: 950VA

Total Filtration: \geq 2.0mmAL

Diameter of X-ray Field: 6cm

Maximum Enclosure Temperature: <60 $^{\circ}$ C

Fusing Core: BGXP-6A

Maximum Rated Capacity:70KV . 8mA . 4s

Weight of X-ray Tube Head:8.0Kg

Vertical movement Range of X-ray Tube Head: \geq 400mm

Fore-and-aft Movement Range of X-ray Tube Head: \geq 900mm

Horizontal Rotating Angle of X-ray Tube Head: 360 $^{\circ}$

Rotating Angle of X-ray Tube Head Moving Around Horizontal Axis: 270 $^{\circ}$

Horizontal Rotation Angle of Movable Suspension Arm: \pm 270 $^{\circ}$

3.2 Main Technical Parameters of X-ray Tube (XD10-0.21/70 X-ray Tube)

Maximum working tube voltage: 70KVP

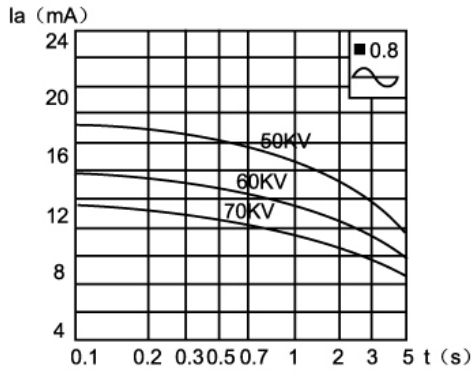
Maximum peak inverse voltage (self rectification): 80KVP

Target Face inclination: 12 $^{\circ}$

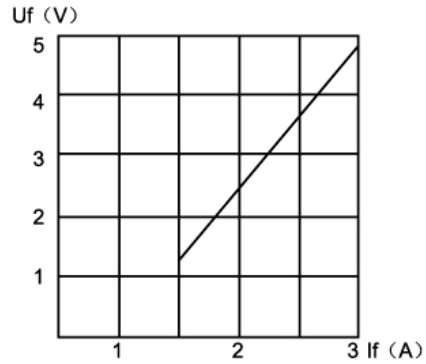
Nominal Value of Focal Point: 0.8mm

Filament Characteristic: 3V \pm 0.5V

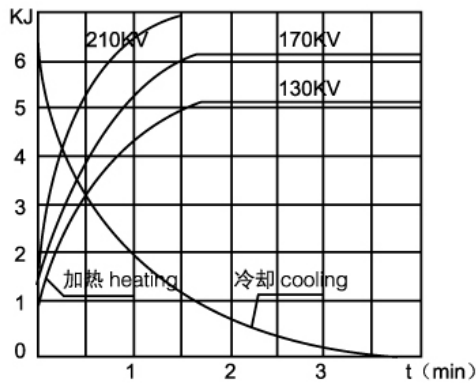
Load Characteristics



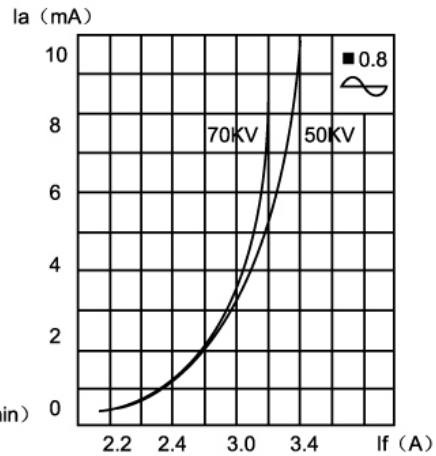
Filament Characteristics



Anode heating and cooling Characteristics



Filament emission characteristics



Safety

Protective Earth Resistance: $\leq 0.2\Omega$

Earth Leakage Current: $\leq 2.0\text{mA}$

Enclosure Leakage Current: $\leq 0.1\text{mA}$

Dielectric Strength between Earthing Metal Component and Mains Power Supply: $\geq 1500\text{V}$

Dielectric Strength of High-voltage Generator: $> 110\%$ of Tube Voltage

Chapter 4 Installation

4.1 After receiving the equipment, please open the packing (The machine is contained in a large packing and a smaller packing). Check the components according to the packing list. Wipe off the anticorrosive agent and get ready for the installation. The installation method is shown in the following figure

4.2 After installation of the mechanical parts, connect the plug with socket tightly

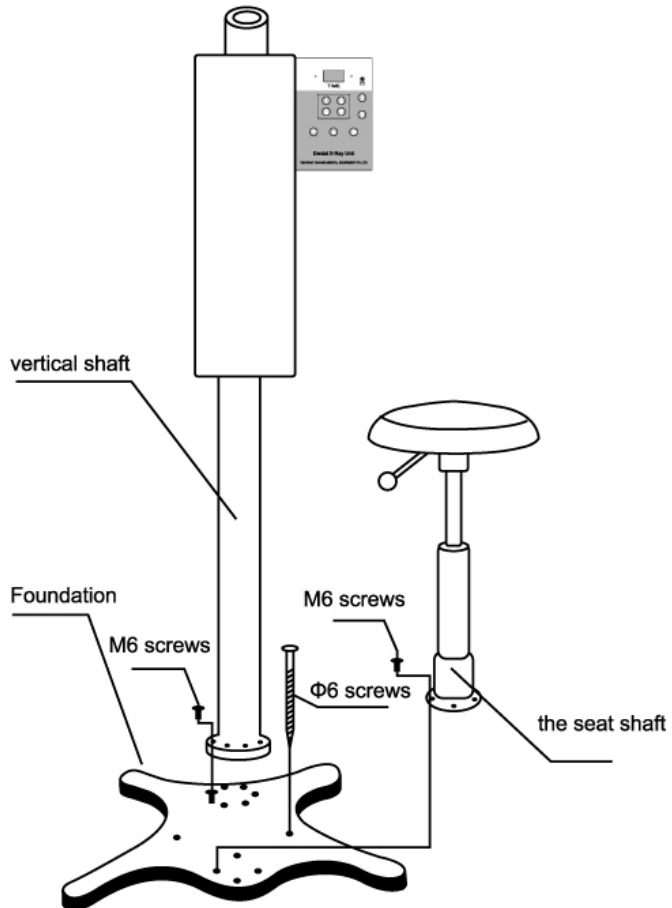
4.3 installation procedure:

4.3.1 Installation of Vertical Shaft:

Put the vertical shaft on the screw hole of the foundation plate. The back rest should face to the direction in which the seat will be fixed. Tighten the 6 M6 screws respectively.

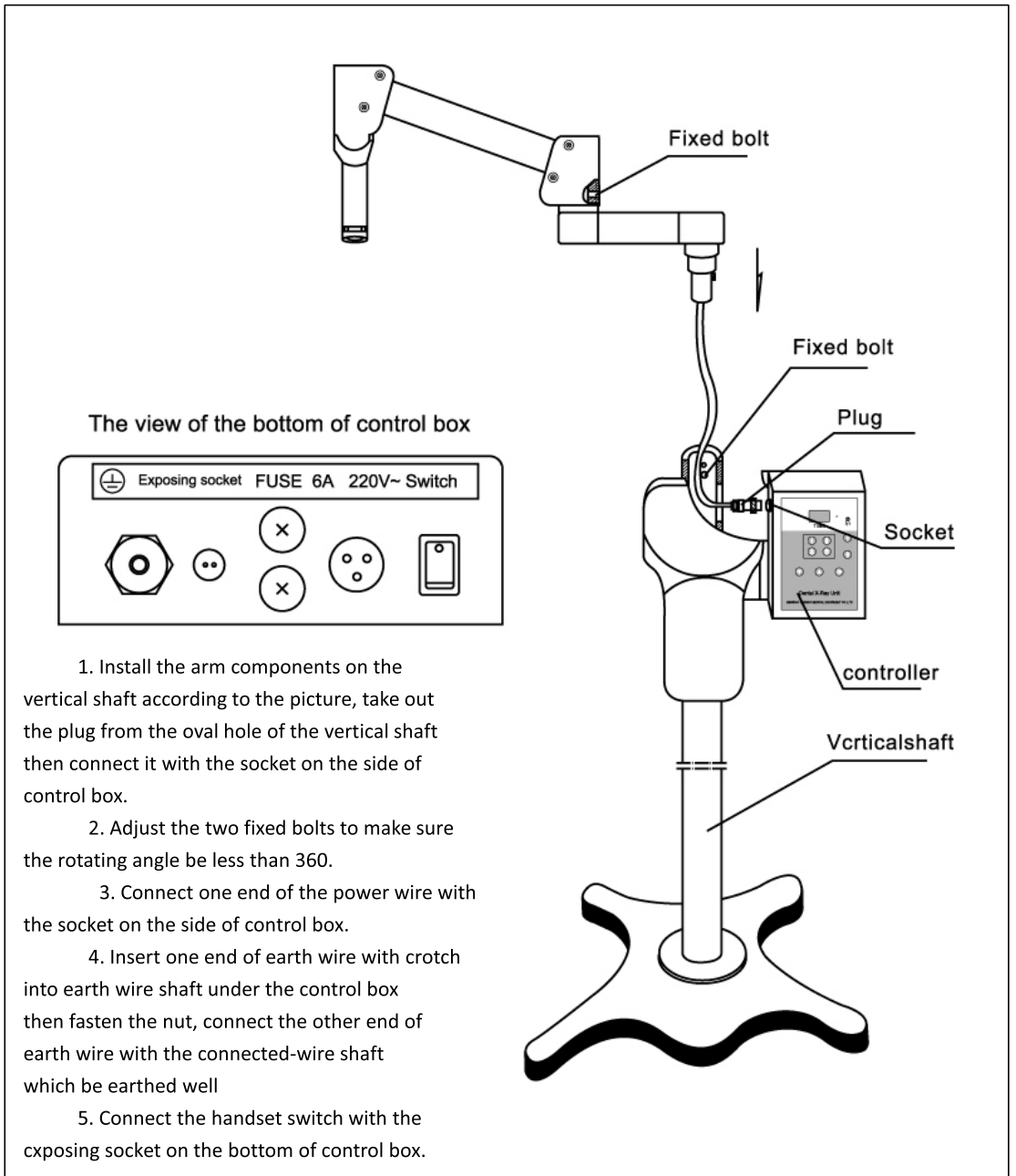
4.3.2 Installation of seat:

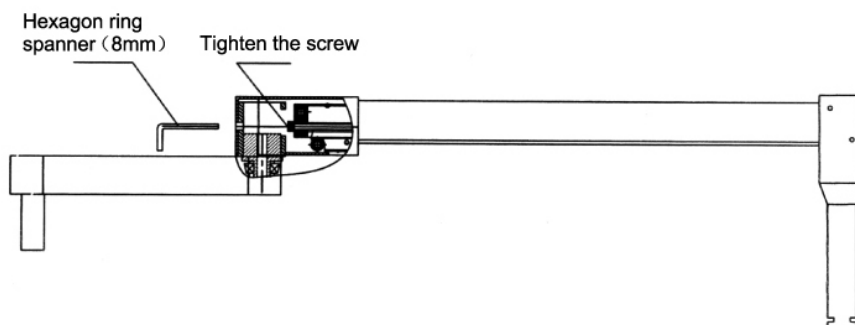
Put the seat shaft on the screw hole of the foundation plate and tighten the 4 M6 screws respectively.



NOTES: After installation of the whole equipment, do fix firmly the whole equipment on the ground with $\Phi 6$ wooden screws.

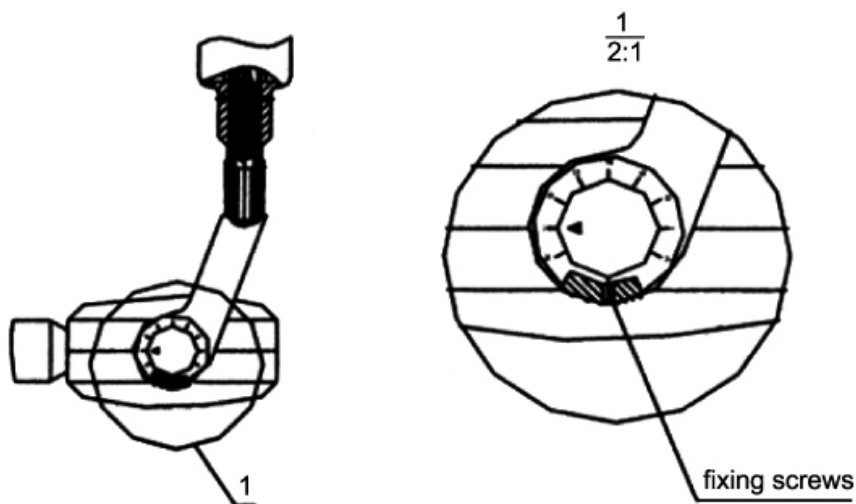
Installation of the arm components





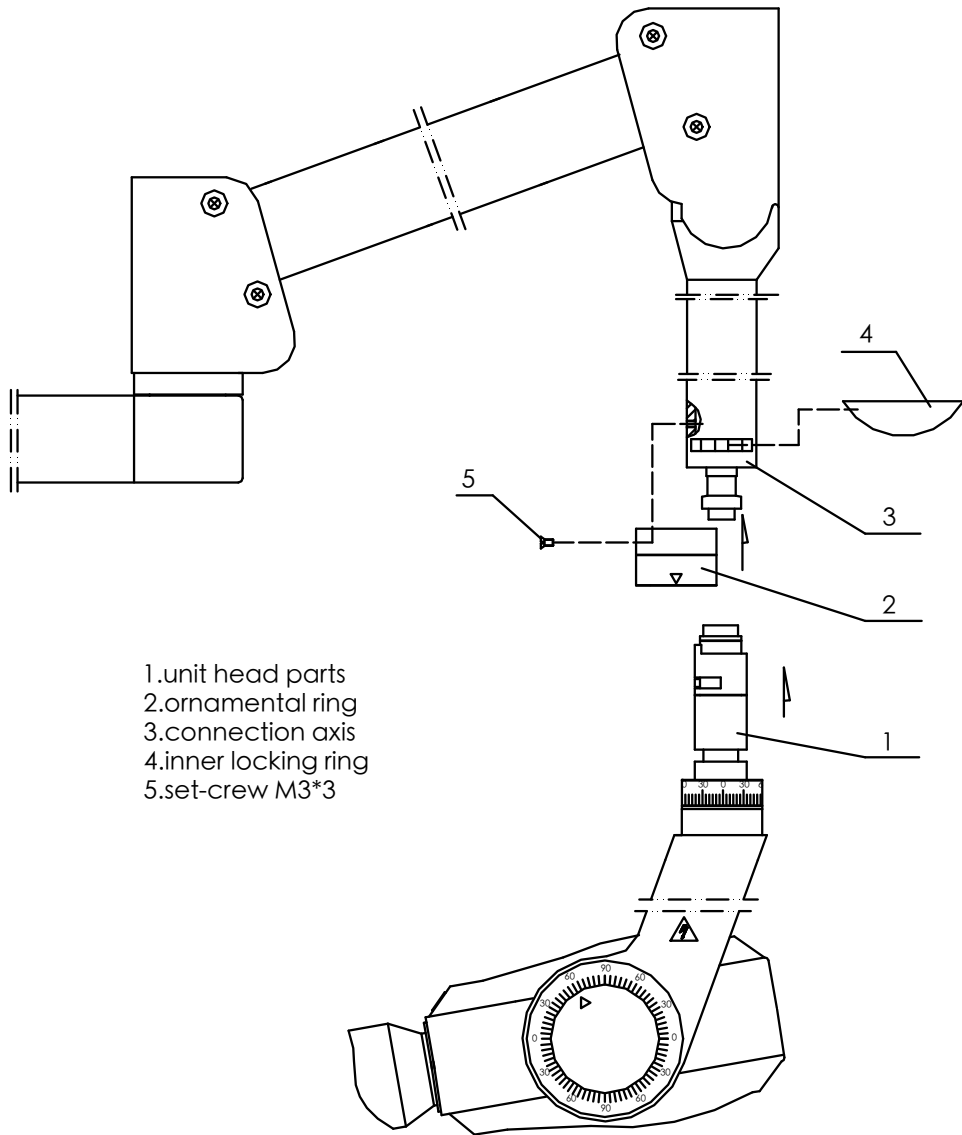
Adjustment of the balance spring

Adjust with the hexagon ring spanner (8mm) if the spring is not balanced. Tighten the screw, the more tightening force it has, the more tightening it is. Put the horizontal arm to the horizontal position in adjusting.



Adjustment of the Equipment Head in Vertical Direction

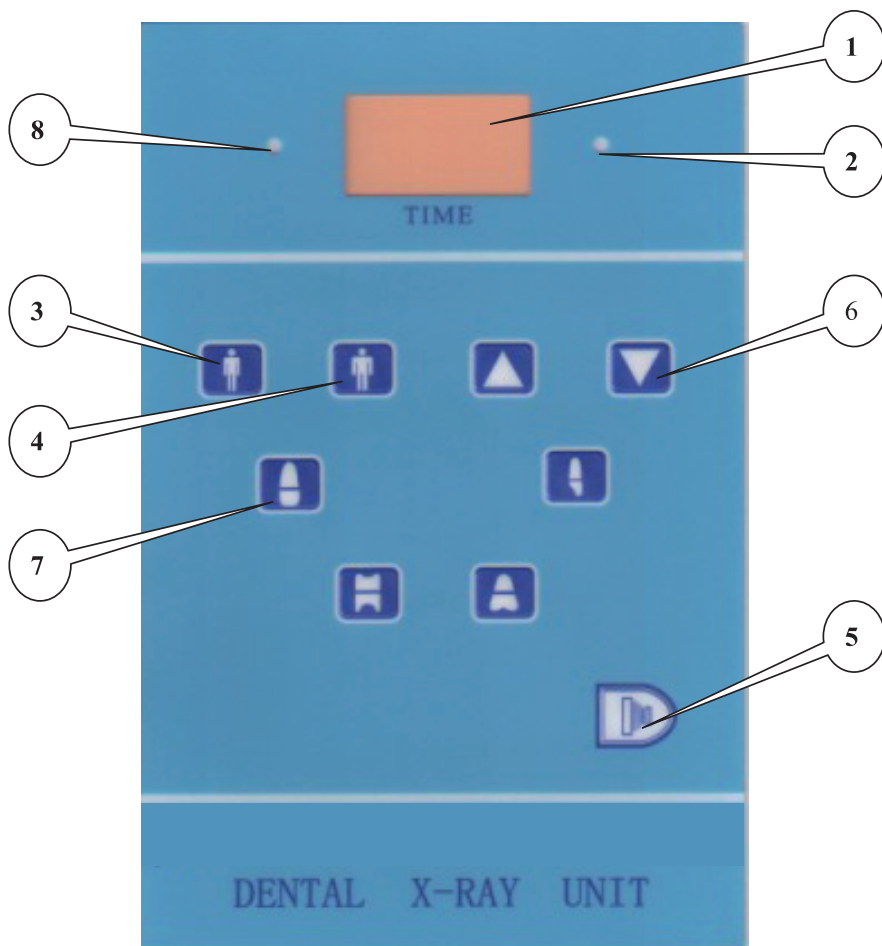
The head can rotate in 270 ° in vertical direction, and can be self-locked at any angle. If the self-lock breaks down (i.e. You want to stop the head on a certain position, it will fall down when you loosen the head), please adjust the 2 fixing screws (one on the left and the other on the right). The friction will go up with the tightening of the screw.



Caution: 1. Do not loosen your grip if the installation of the X-ray generator with the suspension arm is not completed yet.
 2. The whole equipment must be earthed reliably.
 3. When dismantling, push the horizontal arm to the highest point, then you can take apart.

Chapter 5 Use methods

- 5.1. Make sure the power supply voltage is normal, the plug and the socket is well connected and the grounding wire is reliably connected.
- 5.2. Turn on the power switch, if the green indicator light goes on, which means that the machine is connected with power, ready for operation
- 5.3 Operating Panel settings of the Controller:



5.3.1 Function Introduction of Operating Panel:

- (1) Exposure Time: Display the set exposure time, the exposure time will decrease to 0 from the set value while exposure is operated.
- (2) Exposure indicator: When exposure time starts, the yellow indicator light goes on, and the buzzer rings.
- (3) Selection of Body Shape: Slim
- (4) Selection of Body Shape: Plumpy
- (5) Exposure Button: After setting the exposure time, you can directly press the button for exposure
- (6) Fine adjustment Button: The UP and DOWN buttons could be used for the fine adjustment of time
- (7) Selection of Teeth Position: Select the exposure time according to the teeth position.
- (8) Power Indicator: After the power supply is switched on, the green indicator light will go on.

5.4 Max. shooting times: intermittent use, 20 times at most for each hour.

5.5 Cut off the power after the completion of radiography.

Chapter 6 Attentions

6.1 Good grounding before operation.

6.2 Before change fuse you must turn the power off.

6.3 When dismantling the equipment, push the X-ray generator to the highest point, and dismantle the X-ray generator firstly, and then dismantle other parts and accessories

6.4 The operator must stand by at least two meters behind x-ray tube head when exposing.

6.5 As operation accessory to the patient, set protective screen, wear protective uniform.

Chapter 7 Maintenance

7.1 For the equipment that is newly-installed or left unused for a long period, proper training should be carried out before running the equipment.

Training Process:

- ◆ Set the exposure time according to the slim body shape standard, press the exposure button to operate exposure. (repeat for 2 times)
- ◆ Set the exposure time according to the plumpy body shape standard, press the exposure button to operate exposure. (for 1 time)

7.2 The equipment is used for a long period, X-ray generator is liable to slack down.

Please tune the spring adjusting screw in the movable arm with the attached hexagon ring spanner (8mm) to regain balance and stability.

7.3 While the X-ray generator is not balanced well, please tune the two M5 grooved fixing screws on the lower part of the suspension framework where the X-ray generator is suspended.

7.4 After finishing the work, push the X-ray generator to the highest point to loosen the balance spring, aiming to prolong the service life of the balance spring.

Chapter 8 Failures and Overhauling

Failures	Inspected items	Solutions
The power indicator does not work.	<p>Check whether the power supply is activated</p> <p>Check whether the fusing core is damaged</p> <p>Check whether the strand of power line is broken and whether the power line is unsoldered.</p> <p>Check whether the power switch wire is cut off</p>	<p>Wait for power supply</p> <p>Replace the fusing core</p> <p>Replace the power line or weld the sealing off</p> <p>Fix the power switch line</p>
Press exposure button of the timer, the indicator does not work and so does the buzzer	<p>Check whether the light emitting diode has been unsoldered or damaged</p> <p>Check the buzzer and the attracting of the relay.</p>	<p>Fix the line with careful welding, replace the indicator and buzzer, fix or replace the relay.</p>
The controller and timer are operating normally. No X-ray is output.	<p>Check whether the power connectors in the suspension arm and the X-ray generator are contacting well.</p> <p>Check whether the X-ray generator is damaged</p>	<p>Replace the connectors</p> <p>Replace the X-ray generator</p>
The X-ray unit normally operates, but the quality of the radiograph is poor.	<p>Check the exposure time</p> <p>Check the quality of flushing water and development method</p> <p>Check the quality of the film</p> <p>Check the power supply voltage</p>	<p>Use the right development method, pay attention to exposure time and replace the flushing water duly.</p> <p>Do not use the outdated films.</p> <p>Use the stable power supply to make sure the power voltage is at 220V</p>

Chapter 9 Packing List

No	Name	Piece
1	Foundation plate	1
2	Vertical Shaft (the controller)	1
3	Movable Arm	1
4	X-ray Generator	1
	4.1)decorating ring	1
	4.2) meniscus	2
	4.3) M3X5 screw	1
5	Dental Locating Cone	1
6	exposing switch	1
7	remote Control	1
8	Seat	1
9	Power wire	1
10	Ground wire	1
11	M6X16 Screw	10
12	M6X80 wooden screw	2
13	6A fuse	4
14	Filter 1.0/0.5	1
15	Spanner 8mm/5mm	1
16	Screwdriver	1
17	10mm solid wrench	1



Caution: Please read the manual carefully before the installation and usage of this equipment!

Attention: Our Company reserves the rights to revise the manual and modify this equipment. If the information contained in the manual has been changed, we shall not notify specially. Thank you!