



0434

MODEL JYF-10D
DENTAL X-RAY UNIT

OPERATION MANUAL

PREFACE

We much appreciate your kind selection for our dental X-ray unit. We are specialized in producing dental imaging equipment. We stick to the principle of technology enterprise, constantly absorbing advanced technology and talent around the world to innovate our own products. We will continue to insist on the purpose of quality first, honest management, providing our customers with better products and services.

Please read the operation manual carefully before using the unit so that you could learn all the details about technical specification, installation, operating methods and maintenance.

Please contact with the dealer if you have any problem after reading the operation manual.

Thank you again.

Security item:

When working and testing, must obey the security item in manual operation; otherwise must obey the specially request by state (example: the rule of professional security and accident prevention).

Caution: when using, make sure the distance from focus to skin is as long as possible.

Side effect of x ray: there is x ray emission when the device is working, x ray is harmful to our body, so the operator must stand in the effectively occupied zone and there must be lead room or protective screen.

Installation:

Must complete the task according to the technical data, after installation and before start to work, please connect well the grounding wiring.

In order to get clear image and not effect the other machine ,please connect wiring from ammeter separately and the single-diameter > 1mm.









Maintenance:

It engaged in the operation and diagnosis, so it will be maintained and checked every year, clear and lubricate the rotation part. And the device involves high voltage and electric control parts, so should check the safety of the insulation and the reliability of the grounding device.

CONTENTS

Chapter 1 ABOUT THE SYMBOLS-----	4
Chapter 2 INTRODUCTION-----	5
Chapter 3 FEATURES-----	5
Chapter 4 MAIN STRUCTURE-----	7
Chapter 5 INSTALLATION AND ADJUSTMENT-----	10
Chapter 6 OPERATION METHOD-----	16
Chapter 7 PRINCIPLE DESCRIPTION-----	18
Chapter 8 TROUBLES AND SOLUTIONS-----	18
Chapter 9 ATTENTION AND MAINTENANCE-----	19
Chapter 10 ELECTRIC PRINCIPLE FIGURE-----	21
Chapter 11 OPERATOR EFFECTIVELY OCCUPIED ZONE-----	22
Chapter 12 PACKING LIST-----	23

Chapter 1 ABOUT THE SYMBOL

1		Dangerous voltage.	
2		X-ray emitting.	
3		Caution	
4		Protective earth.	
5		Fragile with care	
6		Up	
7		B TYPE	
8		Dryness	



Caution: The user should read the operation manual carefully before installation and use the unit.

Note: Content of the manual is subject to changes without prior notice.

Chapter 2 INTRODUCTION

2.1 Characteristics

JYF-10D dental x-ray unit is an essential diagnostic equipment for dentist with features as following:

- a). Simple structure: The x-ray generator, central controller and unit frame are integrated into one unit.
- b). Good protection: The radiation is much lower than national protecting standard.
- c). Digital circuit: The digital circuit makes exposure time accurate.

2.2 Main use

The unit is particularly provided for synthesis hospitals, cavity specialty hospital and dental clinic to take photo.

2.3 classification

The equipment classified as class I with type B applied parts according to the protection degree of shock hazard.

Chapter 3 FEATURES

3.1 Conditions of operation:

Environmental temperature: 10℃~40℃

Relative humidity: 30%~75%

Atmospheric pressure: 70Kpa~106Kpa

3.2 Condition of transportation and store:

Environmental temperature: -40℃~70℃

Relative humidity: 10%~100%

Atmospheric pressure: 50Kpa~106Kpa

3.3 Power supply

Single phase AC 220V±22V; 50Hz±1Hz

Power capacity: > 1.1kVA

Power resistance: < 2Ω

3.4 Fixed mode

Dental x ray unit is fixed type

3.5 The way of running

Break load; continuous operation

3.6 Main specifications

3.6.1 Tube voltage: 70kV

3.6.2 Tube current: 8mA

3.6.3 Power:480W

3.6.4 Loading time: 0.2~4.0s, follows R'10 series

3.6.5 Focal spot to image receptor distance: 210mm

3.6.6 Horizontal rotating angle of arm: >40°

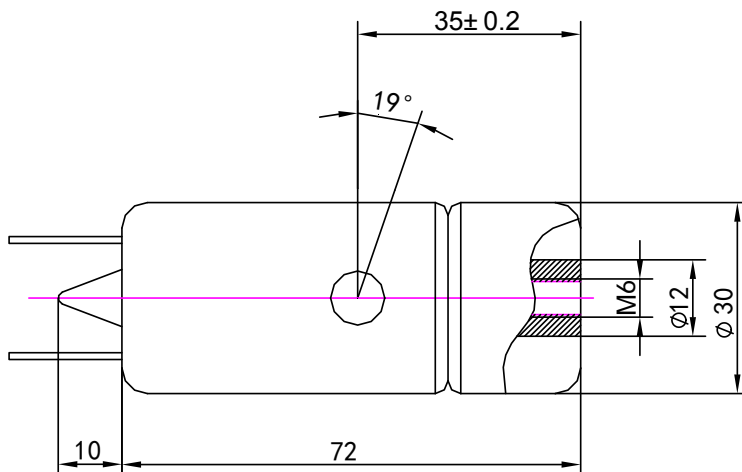
3.6.7 Up-down range of arm: >400mm

3.6.8 Fuse: F10AL250V

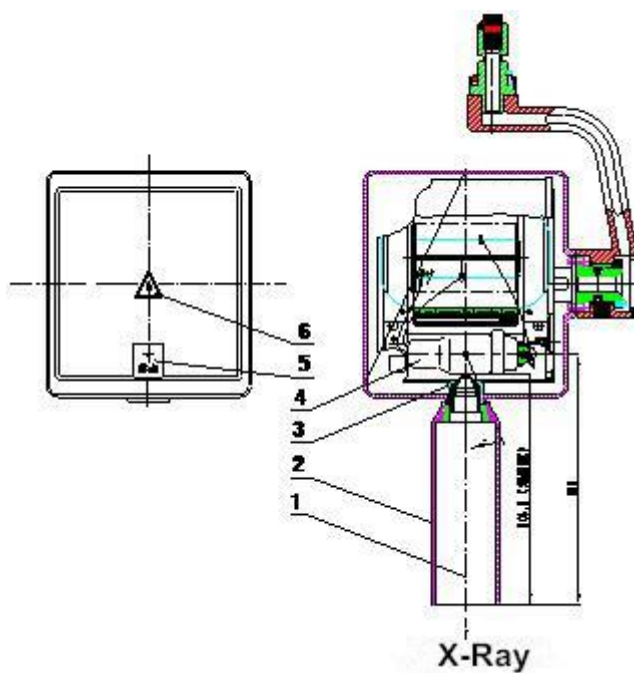
3.6.9 Weight of the unit:59Kg

Chapter 4 MAIN STRUCTURE

4.1 X-ray tube

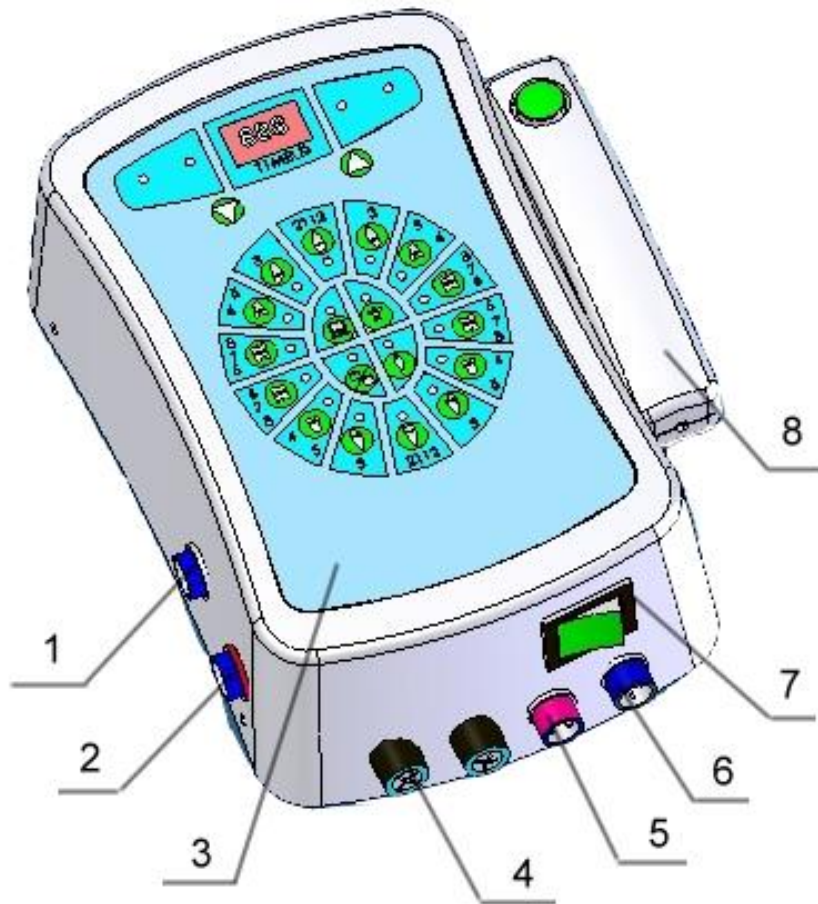


4.2 X-ray generator



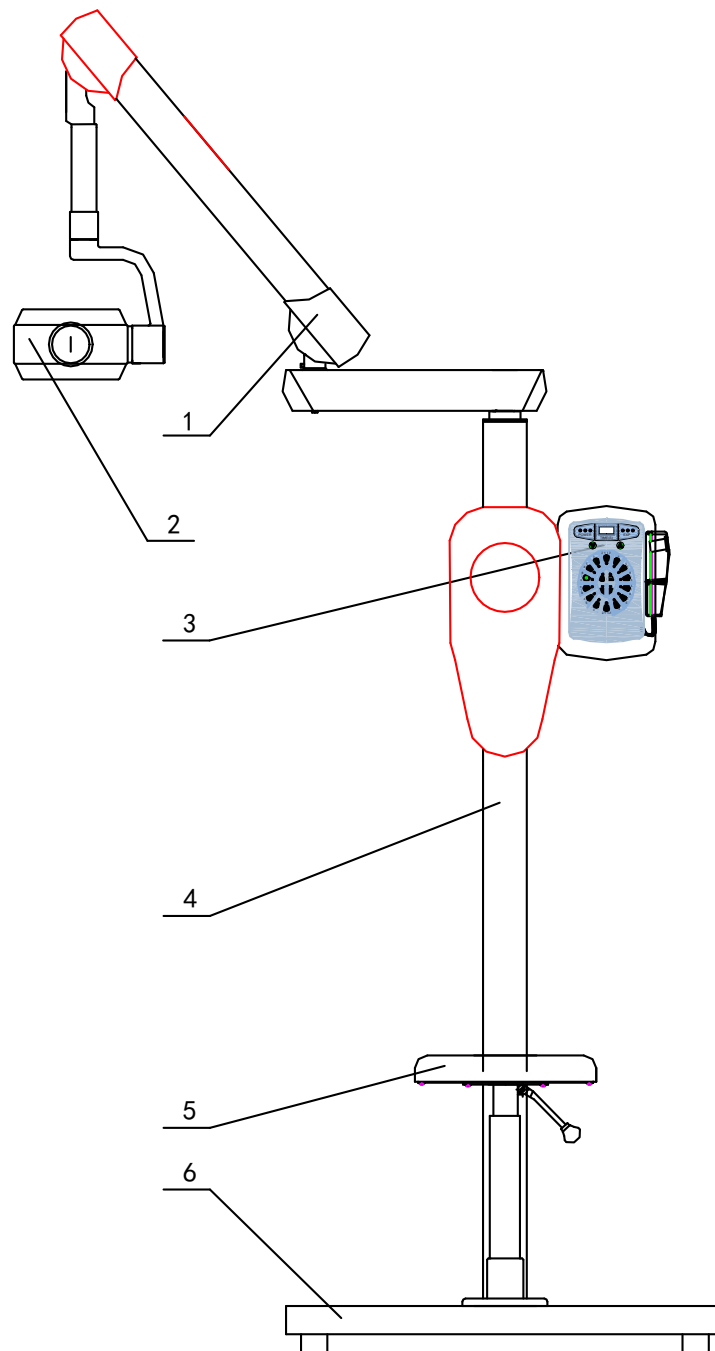
1. Axis 2. Beam cone 3. Window 4. X-ray tube
5. Focus sign 6. High voltage sign

4.3 Central controller



1. Socket for x-ray generator 2. Socket for power supply
3. Operation panel 4. Fuse 5. Warning output socket
6. Exposure switch socket 7. Power switch 8. Exposure switch

4.4 Dental x-ray unit



- 1. Balance arm components 2. X-ray generator 3. Central controller**
4. Column 5. Pneumatic lift chair 6. Base

Chapter 5. INSTALLATION AND ADJUSTMENT

5.1 Selection of room and power supply

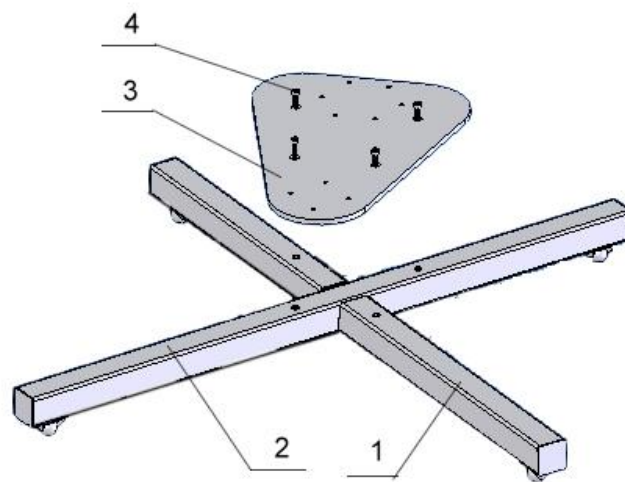
The room in which this equipment is to be installed must comply with all local official regulations applicable to protection against radiation. The lead equivalent of room must be more than 1mmPb.

The device can be connected with electrical grid and medical grid directly, the power supply must be satisfied to the conditions as follows:

Single phase AC 220V \pm 22V; 50Hz \pm 1Hz

Power capacity: $> 1.1\text{kVA}$ Power resistance: $< 2\Omega$

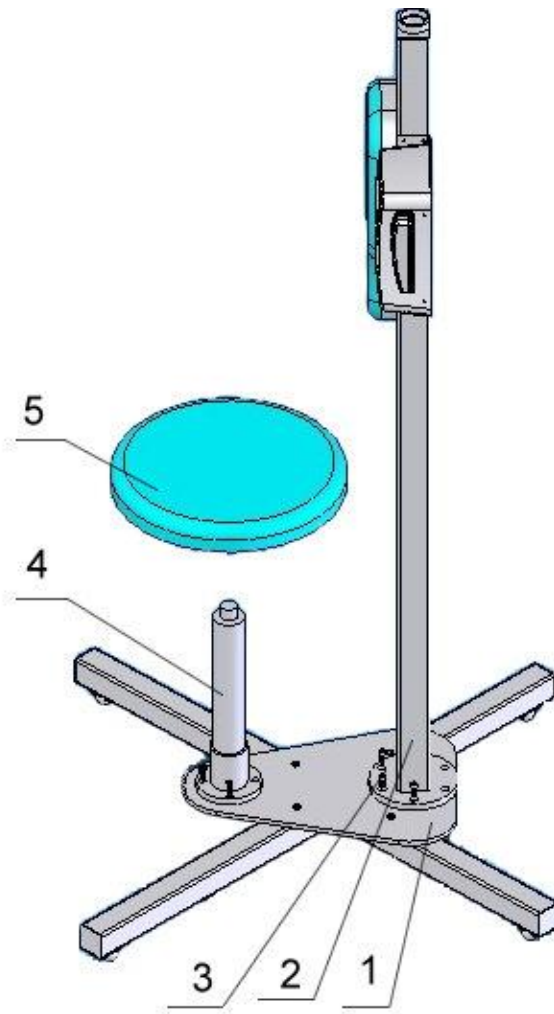
5.2 Installation of base



1. Base A 2. Base B 3. Baseplate 4. Bolts

- (1) Put base A on the ground with the gap upward, placed about 45°, put the side with gap far from forward.
- (2) Put base B on base A, please note that the side with gap far from forward
- (3) Put the baseplate on base A and B with the smaller side forward, align the four screw holes and fixed with screws.

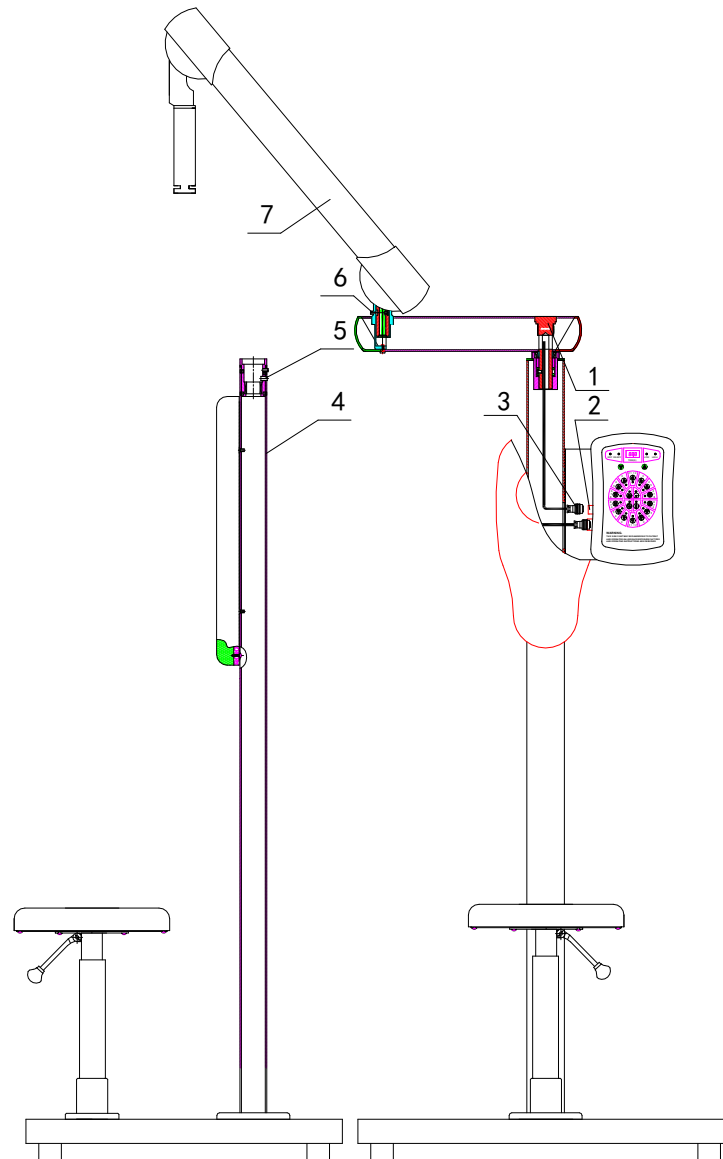
5.3 Installation of column and chair



1. Baseplate 2. Column 3. Bolts M6 4. Pneumatic lifter 5. Seat

- (1) Put the column on the baseplate with the backrest towards the smaller side of the baseplate, then fasten the M6 bolts.
- (2) Put the pneumatic lifter on the smaller side of baseplate, fasten the M6 bolts.
- (3) Aim the hole of the seat at the pneumatic lifter, then press the seat.

5.4 Installation of arm components



- 1. Arm components 2. Socket 3. Plug 4. Column**
5. Stop screw A 6. Stop screw B 7. Balance components

(1) Screw out 5 (stop screw A, the thicker one behind the backrest) a little, make sure that arm components shall not be blocked when being put into the column.

- (2) Put the cable of arm components into column according to picture indication, and pull out the plug from the hole beside the column.
- (3) Put the plugs from the column hole into the sockets, then tighten the nuts. (if this step is not convenient, disassemble the central controller first, fix it again after plugging in)

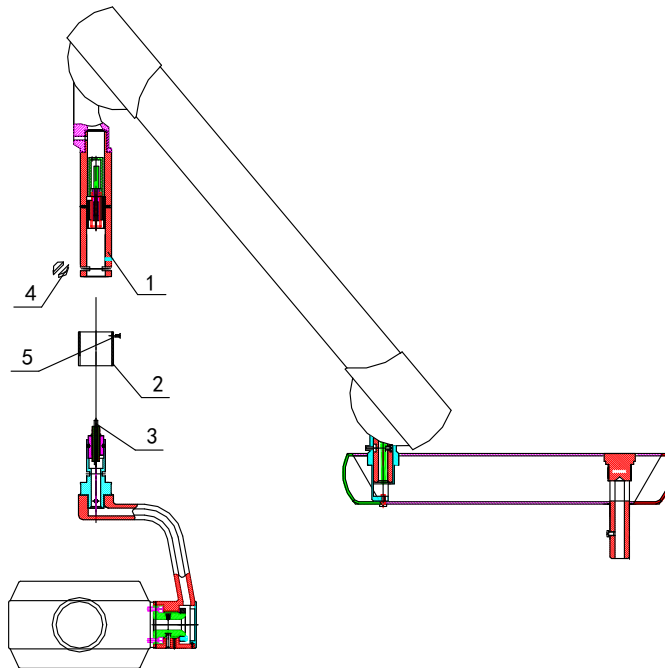
**2. Socket****3. Plug**

- (4) Screw in 5 (stop screw A), make it at the same level with the column surface. rotate the arm, if it can be rotated about 180° , means that the screw is working. the arm is not allowed to be rotated 360° .

5.5 Installation of x-ray generator



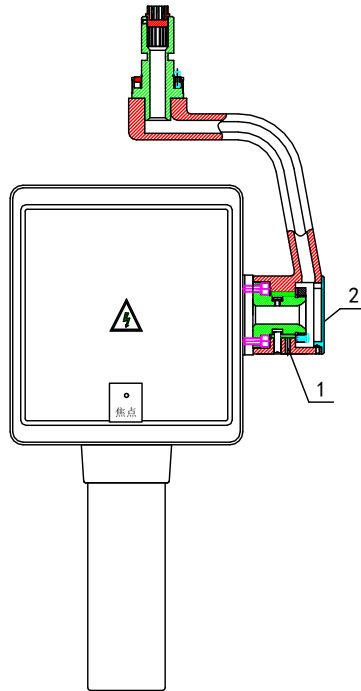
Attention: must be done by two people



- | | | |
|--------------------|----------------------------------|---------------------|
| 1. Contact | 2. Ring | 3. Tube plug |
| 4. Meniscus | 5. Countersink Screw M3X5 | |

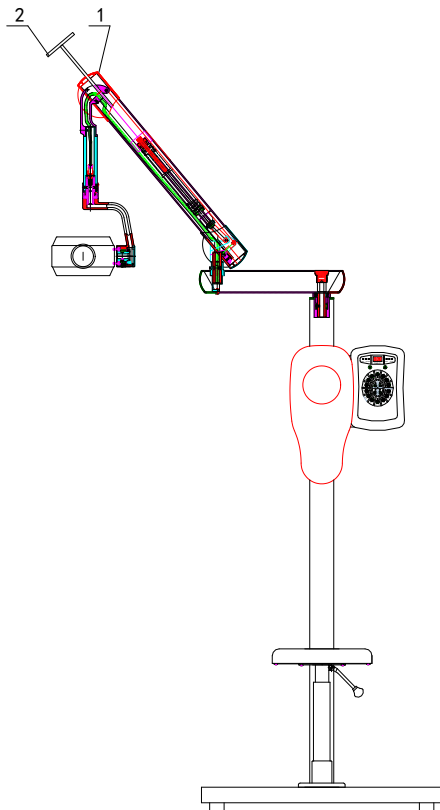
- (1) Take off screw 5, up the ring 2, then remove the meniscus 4.
- (2) The other people hold the tube head, insert the plug 3 into contact 1.
- (3) Visual inspection, when the 2 side of the gap align at the circular groove of 3, put the meniscus 4 into the two side of the gap and then down the ring 3, make the hole of side of 3 align at the hole of side of 1, put into screw 5, tightening.
- (4) Screw the cone to the tube head from the accessories bag.
- (5) Put the hand switch handbrake on the control pannel.
- (6) Contact the end of cord and the ground wire to the ground standing of the back of the column and the other end close connect with the ground, to make sure safety..

5.6 Adjustment of x-ray generator



The x-ray generator can be rotated freely and self-locking, if it is so flexible that can not self-locking, you can fixed 1. if it is not flexible you can loosen 1. if still can not meet the requirement, you can demount 2, and add some Oil between axle and surface.

5.7 Adjustment of balance



- a. Demount the cover on the balance component. Method to demount: push up the cover. if it is not moved, please put a wood chip board at the lower edge of the cover, then to beat the board lightly.
- b. Push the x ray head to the highest point with the balance arm about 45° , from the hole we can see there is a hexagonal nut inside, put the special spanner into the nut, then clockwise to increase the pull.

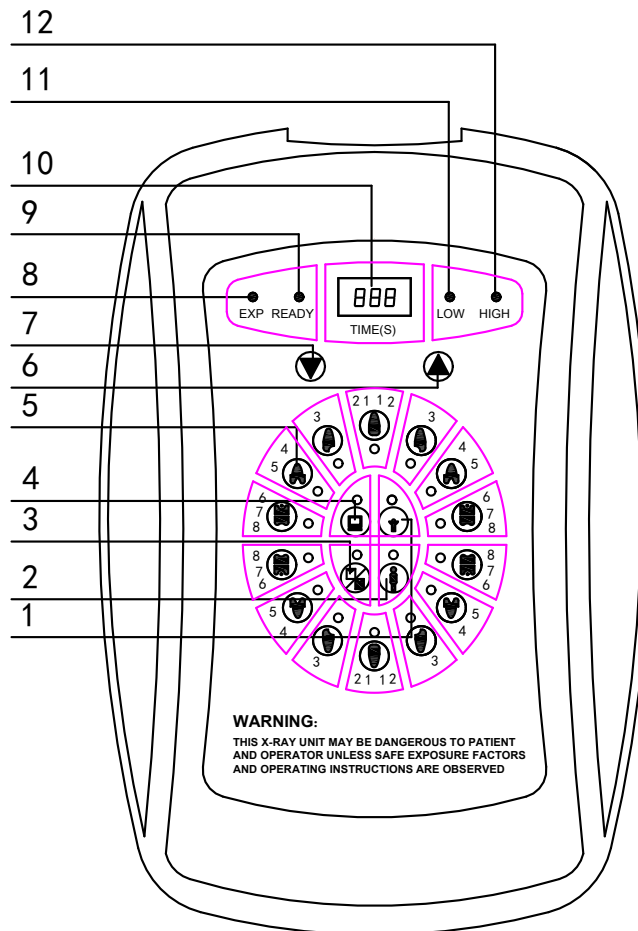
1. Cover 2. Special spanner

Chapter 6. OPERATION METHOD

6.1 Make sure that the power supply is normal, and all plugs, ground wire keep good connection with the machine..

6.2 Turn on the power, the machine can be worked if the power indicator lamp and LED light.

6.3 Operation panel: operation panel setup is according to the patients.



1. Button for child

2. Button for adult

3. Button for occlusal film

4. Select for sensor

5. Select tooth: select the number 1-8 for tooth
lighting lamp means selected tooth

6. Increase exposure time

7. Decrease exposure time

8. Exposure indicator lamp

9. Normal voltage indicator lamp

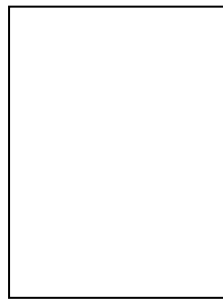
10. LED display

11. Lower voltage indicator lamp

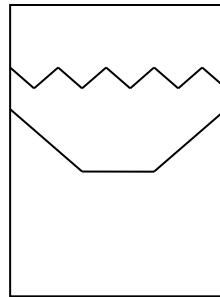
12. Higher voltage indicator lamp

6.4 Place the film

a. Recognize the film



Front side



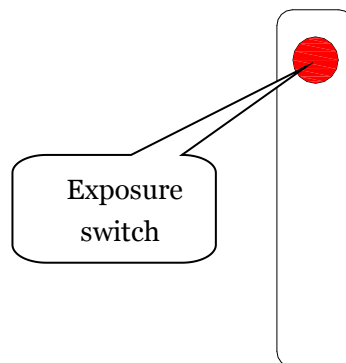
Back side

- b. Put the film in the mouth, make the front side against the inside of the selected tooth, using thumb to press the back side, make them fitting close.

6.5 Adjust the beam cone, make it perpendicular to the front side of the film.

6.6 Select exposure time: press the button on the control panel according to the tooth Selected, there will be exposure time displayed on the LED

6.7 Exposure: Press the button of exposure switch (or remote device) to expose until the time is ending with buzzer sound. Then take out of the film.



Do not loose your hand when exposure, or the exposure will be stopped

6.8 Developing:

a. light-room film: extract the liquid about 3 or 4ml with the injector and pour into the tooth-bag, take out the film to wash with clear water after pressing about 2 or 5min with hand.

b. dark -room film: tear the tooth-bag in dark room, take out the film and clam with

piece,put it into the developing solution,take out the film after 3 or 5min to wash it with clear water.then put the film into the fixer solution about 3 or 5min,wash it with clear water again..



Caution: 1. Please keep pressing the button of exposure switch during the exposure, or the exposure will stop.
2. The unit will stop working at once while releasing the button of exposure switch if there is any trouble during the exposure

6.9 Please turn off the power if the exposure stops.

Chapter 7 PRINCIPLE DESCRIPTION

Turn on the power,after the control circuit transformed,the primary coil of high voltage generator will get power through voltage attenuation circuit,the secondary coil get high voltage for x ray generator to produce x-ray.

Chapter 8 TROUBLES AND SOLUTIONS

If the device fails,please follow the guidance can solve most of the questions.

1. Power supply indicator does not light.first make sure the power switch is turned on,check the tie-in of power cable,then check the fuse.
2. Exposure indicator dose not light when press the exposure switch,and there is no buzzer sound.please check whether the power supply indicator light (if not,please

- check as item 1).
3. The image is a little white or dark or not clear. First please make sure the power supply indicator and exposure indicator light and there is normal buzzer sound (if abnormal, please check as item 1 and 2). When exposure, make sure that keep pressing the exposure switch, do not loose until the exposure finished.
 4. Exposure exceeds the time setted. the exposure indicator and buzzer sound are not over, please loose the exposure switch immediately, then turn off the power supply.
 5. If the exposure indicator or buzzer sound at any time, please turn off the power supply, except when pressing the exposure switch.
 6. The x ray head heat or there is buzzer sound inside even no exposure. please turn off all power supply.
 7. If the fuse broken, please use a screwdriver counterclockwise the fuse socket to change with new fuse.
 8. If the problems can not be solved after taking all the measures above, please ask the professional technical staff to maintain it.
 9. The warranty for this device is one year, and we also provide maintenance service during the rest of the device lifetime.

Chapter 9 ATTENTION AND MAINTENANCE

Attentions:

1. Good grounding before operation.
2. Because the heat capacity of small x-ray unit is somewhat limited, it is suggested that operate it with intervals about 2mins.
3. There will be x ray radiation during exposure, it will be harmful to the body if using long term, so the operator must stand by the effectively occupied zone and there must be lead room or protective screen.
4. Please cut-off the power supply immediately when accident happen. it can be used again after it is qualified.
5. Please adjust the power supply if the local power supply is not stable. To avoid damaging the device because of the un normal power supply.
6. Make sure that the film be within its validity period before using, the best film that much more compatibility with our equipment is AF-01 type produced by ourselves.
7. The repair and maintenance of the device must be solved by the qualified person trained by our company.
8. The device must be operated by qualified person trained by our company.
9. All staff should as far as possible reduce the time duration of the x ray filed.
10. All staff should as far as possible away from the x ray source.

11. Operate in isolation room, doctors and assistants must use lead glove, lead clothes, lead glasses, lead cap and so on. to minimize radiation field of vision during the diagnosis, to prevent the scattering area is too large.
12. When the patients being treated, there must be somebody always monitoring the situation of the patients, to ensure the safety of patients.
13. Patients with glasses, denture and hairpin, etc may enter the radiation scope, should be removed to avoid causing image illusion.

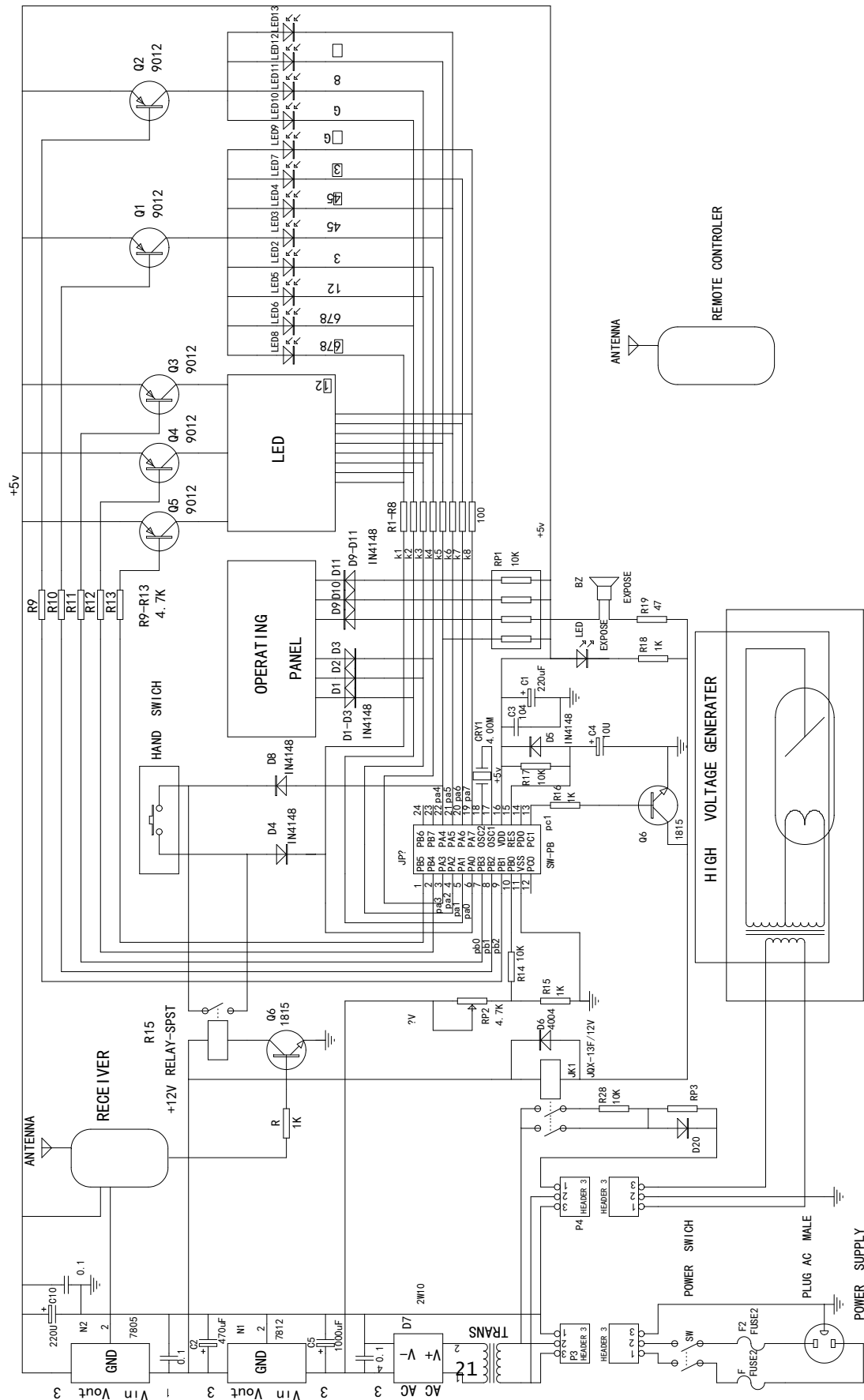
Maintenance:

1. During disassembling the machine every time, first disassemble the unit head, then the other parts.
2. As the unit stops using, push the horizontal arm to the highest position so as to loose the balancing spring in order to prolong the use life of the spring.
3. After operation, please use medical alcohol to clean and disinfect the cone and parts touched by patients. after disinfection, connect the power supply after good ventilation.
4. Clean the machine surface with dry cloth every week, check the connector contact are good.
5. To check the device once a year, check whether the indicator, display, knob and switch work normal; whether there is oil leakage of x ray source components; whether there is abnormal sound during exposure; whether the screws of mechanical parts are loose.
6. If the device stopped using for more than 2 weeks, should preheat the device as follows: turn on the power for 5 minutes before using.
7. The temperature of the room should be kept in the range of $+10^{\circ}\text{C} \sim +40^{\circ}\text{C}$, relative humidity should be kept in the range of $30\% \sim 75\%$.

Warning:

Please choose the power supply or grid with power supply capacity more than 1.12kVA. if the machine sharing the same power supply with other devices that require high precision (such as electrocardiogram machine), it will produce AC interference to other devices.

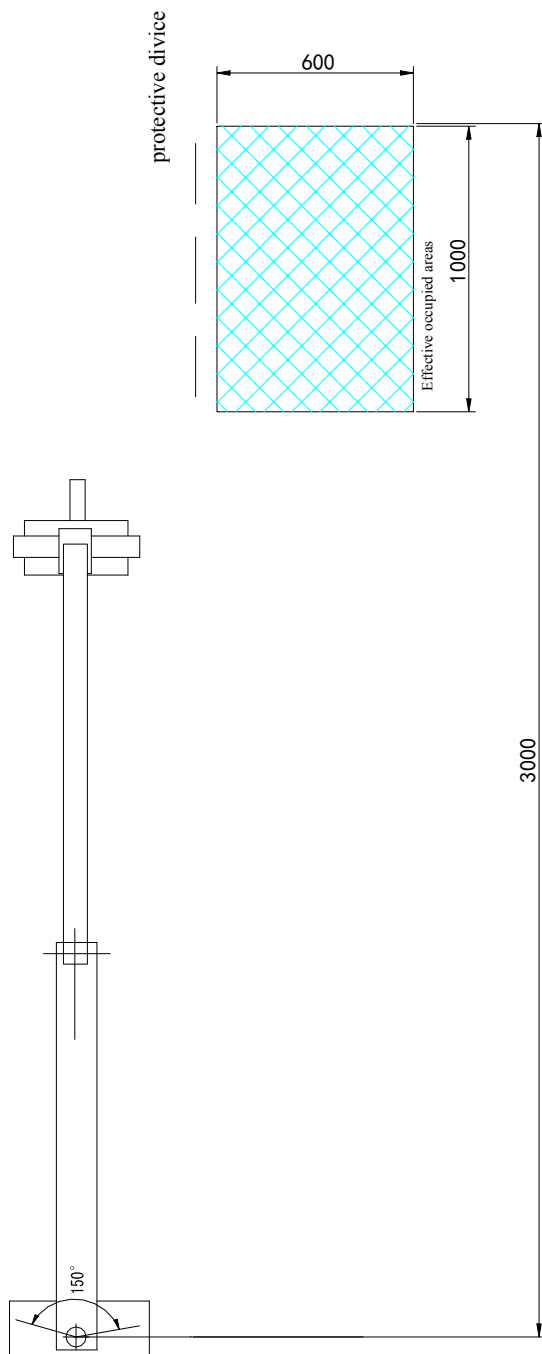
Chapter 11. ELECTRIC PRINCIPLE FIGURE



ELECTRIC PRINCIPLE FIGURE

Chapter 11. OPERATOR EFFECTIVELY OCCUPIED ZONE

Effective occupied areas



Chapter 12 PACKING LIST

No.	Name	Piece
1	Packing box	1
2	Arm components	1
3	Seat	1
4	Lifter for seat	1
5	Column components(including control box)	1
6	X-ray generator components	1
7	Accessories	1
7.1	Spanner 2mm/3mm/4mm/8mm	1each
7.2	Special spanner for adjusting balance	1
7.3	Screwdriver(—/+))	1
7.4	Fuse 10A	4
7.5	Power wire/ground wire/exposure switch	1each
7.6	Remote exposure switch	1
8	Operation manual and certification	1
9	Base components	1