

100mA Mobile Medical X-Ray Machine

The Users Manual

Read the Users Manual Carefully Prior to Using This Product

Notice

In order to insure the best result of this machine; insure the safety of the equipment and

personnel, please read this users manual in detail before operating.

● The manufacturing business provides limited warranty for the safety, the reliability and the function of this machine under the following condition,

1. Installation, testing, operating and maintaining are performed by licensed professional personnel
2. The power supply, the electricity facilities and the environment with which this machine use, is match relevant directives.
3. The users are presumed to operate the machine under the manual's instruction.

● Except the following circumstance, the manufacturing business provides 1 year product warranty

1. Damage caused by inappropriate impact during the process of installation and usage
2. Operating the product regardless of the users manual instruction
3. Dismantling, replacing hardware, modifying this machine without the authorization of the manufacturing business
4. Replacing spare parts which are not designated by the manufacturing business
5. Malfunction caused by the environment that is not in line with the users manual provision(power supply, usage environment etc.)

In this text

【Caution】 means that possible personnel injury may caused if violating the instruction

【Notice】 means that possible system failure & photograph failure may caused if violating the instruction

This equipment is designed for medical diagnosis. Please use it for medical purpose only.

Thanks for using the product of our company, our company provides technique consultation, after-sales service and maintenance for you with all sincerity.

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I. Summary

Type CCX-100BY 100mA mobile diagnostic X ray machine with section combined X-ray tube head, full-wave rectification, is suitable for all kinds of hospitals making x ray and photographing, especially for injure dept. of orthopedics, operating room and household ward.

This efficiency-improved x ray machine takes the following advantages, adopts high-pressure silicon, full-wave rectification technology. With kilovolt (kV), milliamperere (mA) and time (s) three factors interlocks control system. Overloading indicator & the protection circuit of excessive voltage & insufficient voltage, thus the X-ray tube head of x ray will not be damaged because of mis-operating. Equipped with steady filament voltage circuit to control the X ray dosage while photographing. Remotely controlled exposing & manually controlled exposing options. Sound & flash indicator while exposing for patients & medical personnel convenience

This machine is equipped the dynamoelectric cluster limiter with shadow positioning. The dynamoelectric cluster limiter will send out a beam of visual light while operating to aim the nidus and the scale of the visual light overlaps the scale of X ray exposing. This function make it convenient that medical personnel position the nidus & the x ray exposed area.

This machine has a movable cantilever sliding in vertical direction so that it is flexible to adjust the X-ray tube head to appropriate angle & height. When the complete machine is moved, the cantilever of the X-ray tube head can be set to the minimum position & lock, safely and conveniently. The gross weight of the complete machine is 150 kilograms, width is 72 cm, high is 200 cm & length is 118cm. It can be used to moved in the ward & between beds conveniently.

II. Main Technical Specifications

1. This machine

is a single focus point, full-wave rectification bedside X-ray medical diagnosis equipment with a combined X-ray tube head.

2. Maximum Ratings:

KV \ S		~3.2	~4.0	~6.3
		mA		
16		90	90	90
32		90	90	90
63		90	90	—
100		80	—	—

3. Condition of the power supply

Single-phase alternating current Voltage: 180V-250V Frequency: 50Hz

Power supply resistance $\leq 0.2\Omega$ Instantaneous electric current: 37A (Max)

4. Time-recorder 0.08-6.3s, 20 shelves of electron type
5. X-ray tube specification : XD4-29/100, focus 4.3
6. X-ray tube focus highest position (above ground level) $\geq 1710\text{mm}$
X-ray tube focus lowest position (above ground level) $\leq 480\text{mm}$
7. Remotely exposing distance: 6m
8. The required pulling force to move the whole machine $\leq 250\text{N}$ (25kg)
9. Weight of the complete machine: 150kg
10. Power of Electric Beam Limiting Device: AC 24V, Capacity 110W.
11. Indicator Power of Electric Beam Limiting Device: AC 24V, Power: 100W, Tungsten Haloid Light
12. Illumination of Electric Beam Limiting Device: no less than 100Lx at 1000mm from X-ray focus to target area
13. When X-ray focus at 650mm away from the film, max illumination scale $\leq 350\text{mm} \times 350\text{mm}$;
When X-ray focus at 1000mm away from the film, max illumination scale $\leq 50\text{mm} \times 50\text{mm}$

III. Machine Main Parts

1) The Mainframe

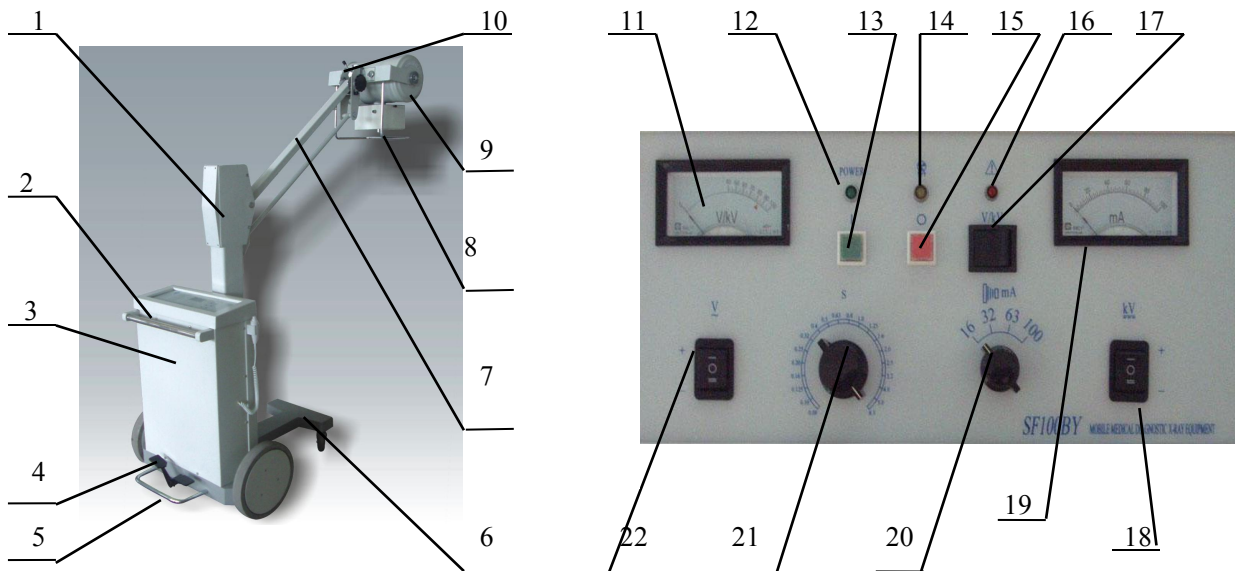
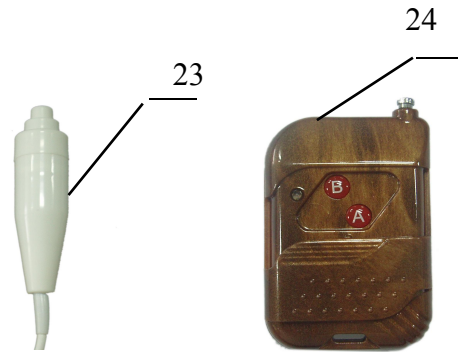


Figure1

1. Pillar
2. Hand Push Pole

- 3. Controller
- 4. Brake Pedal
- 5. Foot Pedal
- 6. Pedestal
- 7. Cantilever
- 8. Electric Beam Limiting Device
- 9. X-ray Tube Head
- 10. Tube Head Rotating Brake Spanner
- 11. Voltmeter
- 12. Power Indicator Lamp
- 13. Power Switch On Button
- 14. Transmit Indicator Lamp
- 15. Power Close Button
- 16. Alarm Indicator Lamp
- 17. V/kV Select Switch
- 18. High-Voltage Select Knob
- 19. Ampere meter
- 20. mA Select Knob
- 21. Time Select Knob
- 22. Voltage Select Knob
- 23. Hand control switch
- 24. Remote device



2) Electric Beam Limiting Device

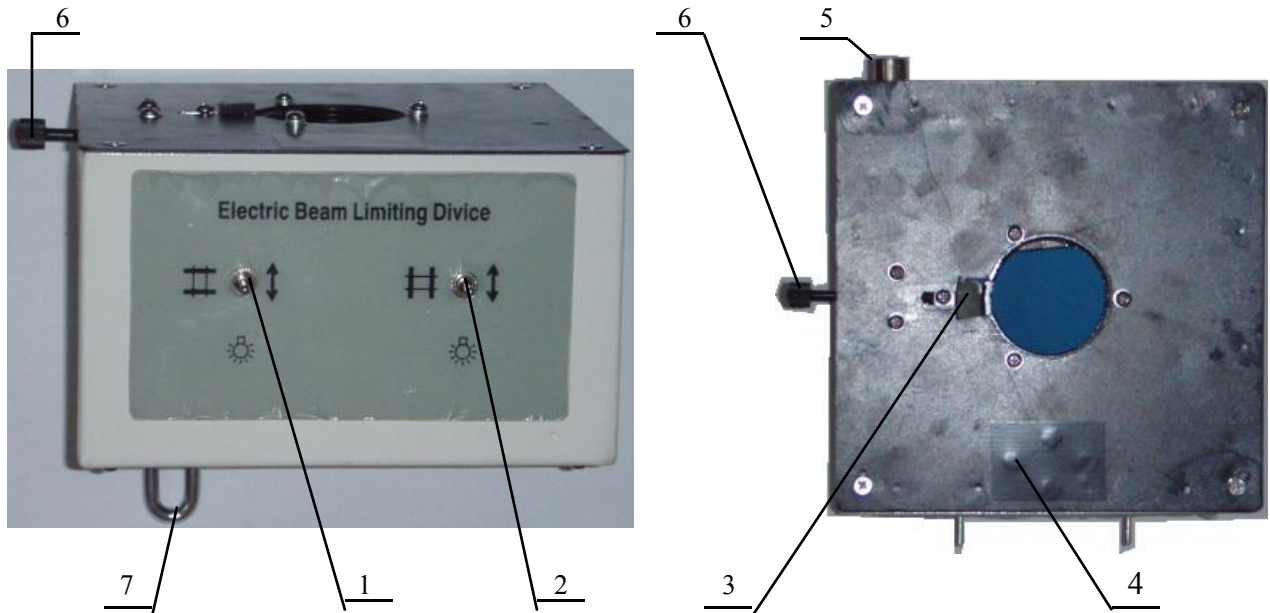


Figure2

1. Longitudinal Beam Field Switch
2. Transverse Beam Field Switch
3. Tube Head Locking Screw Nut
4. Beam Field Indicator Adjustment Hole
5. Power Socket 6. Locking Screw 7. Focus Skin Limit Pole

IV. Installation

1. Power Supply Requirement

Single-phase alternating current Voltage: 180V-250V Frequency: 50Hz

Wire resistance $\leq 0.2\Omega$ Power supply capacity : 8kVA

Instantaneous electric current: 37A (Max)

[Caution]: the 3-plug outlets must be connected to ground goodly to promise the safety of the equipments and Human body.

When the above mentioned condition of power supply cannot be satisfied, please install another power supply with the voltage no less than 250V and the capacity no less than 6kVA

2. Unpacking Check

Open the packed wooden box, take out 《the users manual 》in the box, according to the enclosed packing list in the 《the users manual 》, check the machine components & the accessories . Wipe and clean the antirust oil and the dust.

[Caution]: Do not dismantle the 2 angle pull strips at first, in order to prevent the cantilever rebounds, resulting in personnel's injury and machine damage.

3. Installation Steps

- 1) From the packing box inside, take out the machine body, X-ray tube head, dynamoelectric cluster limiter
- 2) Tore down the wrapped paper etc and clean the antirust oil, dust etc.

【Notice 】 Before X-ray tube head is set up on the cantilever, the 2 angle pull strips are strictly prohibited to tore down(see figure 3), in order to prevent the rebound injury and machine damage.



Figure 3

3) Insert the X-ray tube head (window downward) into the cantilever hole and lock tightly two screw bolts. (See figure 4)

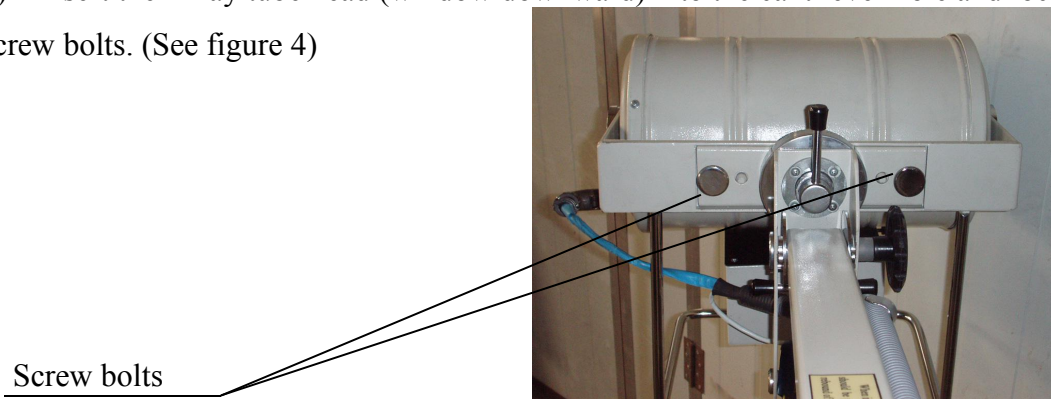


Figure 4

4) After confirm that X-ray tube head already safely, reliably and fixedly installed on the cantilever, the 2 angle pull strips can be tore down.

5) Loosen the locking screw shank of the dynamoelectric cluster limiter, Make the fixed screw bolt screwed in the X-ray tube head window of the x ray machine, and tighten the screw. (See figure 5)

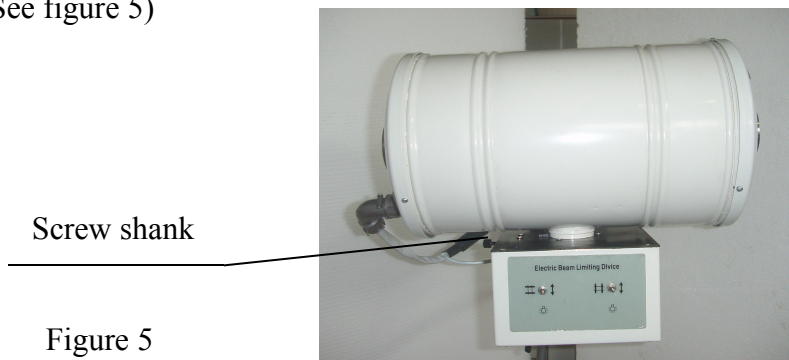


Figure 5

6) Get the 7-core cable, manual controller cable and power supply cable ready.

V. Machine Trial, Adjustment & Training

This machine has already been tested strictly, in consideration of the power supply circumstance at the customers; shock & damp during transportation; the idle period from manufacture to application etc, it's necessary to double check before use.

Please refer to circuit diagram of the x-ray machine when testing & adjusting.

1. Adjust & Try with zero load

- 1) Get connected the controller power supply cable, the manual controller cable, the cluster limiter cable, the 7-core cable.
- 2) Lead 2 lines(for the filament transformer) out from inside the socket(1), (3) of 7-plug cable electric outlet
- 3) At socket (1), (3), lead & connect an 300V alternating current voltmeter. (See figure 6)

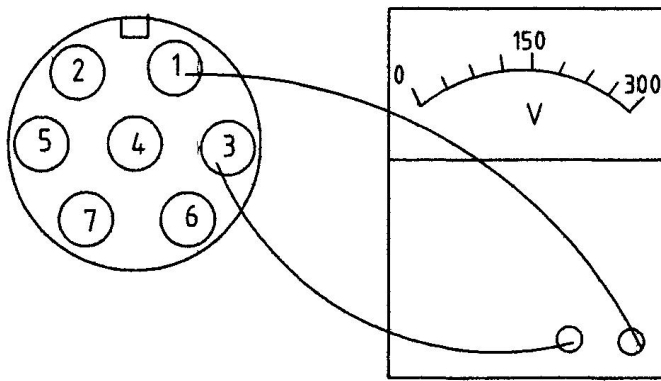


Figure 6

- 4) Turn on the machine power switch (the power supply indicator lightening), the buzzer inside the machine beeps spasmodically.
- 5) Regulate “V/kV” option knob to “V”
- 6) Adjust the power supply switch, making the electric voltmeter of the controller indicate for the red “π” (approximate 220 V). Inside the set. When power supply switch regulated to 215V-225V, it beeps continuously for 20-60 seconds. This explains the power supply choice matches requirements. When beep voice are not terminated by itself, it indicates that power supply choice isn't appropriate. Two kinds of exposing at this time, namely the manual control or remote control does not function. (refer to protection over excessive voltage exposing & insufficient voltage exposing)

- 7) Turn “mA” option knob to "16", "32", "63" and "100" mA respectively, (1), (3) lead on-line electric voltmeter displays about 220V. When regulating power supply one interval leftwards or rightwards, (1), (3) lead on-line electric voltmeter index number should be change.
- 8) Remove electric voltmeter from socket (1), (3) of 7 core cable plug to socket (1), (2) (High voltage transformer)
- 9) Regulate “V/kV” option knob to “kV”
- 10) Regulate KV knob to 80 kV; time knob to 2s
- 11) Turn “mA” option knob to "63" mA, OK to expose. (1), (2) lead on-line electric voltmeter has the signals at this time, its numbers should match as the following list.

kVP	50	60	70	80	90
OP/V	150	170	190	210	230

- 12) This machine attached a remote control set, controlling from a distance $\geq 6m$. You can press the remote control button carry on x-ray exposing instead of manual controlled exposing.

2. Mis-operation experiment

This machine is established with (KV), (mA), (s) 3 factors interlocking electric circuit. When exceeding the rule capacity of the constitutions will initiating the automatic execution protection; and cannot proceeding exposing. (See also anterior max capacity form)

3. Concerning the protection electric circuit of excessive voltage exposing and insufficient voltage exposing

For keeping X-ray tube head from conducting overrun exposing (overrun kV exposing) and insufficient voltage to exposing (shortage kV exposing), this machine design has its protection of electric circuit. when the voltmeter outruns red “ π ” for a lot of grid (above less 190V or more 230V), alarm spasmodically beeps; protecting electric circuit cuts off exposing output automatically. At this time, both remote control & manual control operations can't make the x-ray machine to expose.

While experiment, factitiously adjust power supply and make voltmeter exceed red “ π ” for a lot of grid (above less 190V or more 230V). You can hear beeps inside the machine. exposing can't carry on. Only when voltmeter set at the red “ π ”, after 20-60 seconds; the beep voice is

terminated by itself, can exposing proceed.

The designed power supply voltage of this machine is 180V-250V, the x ray machines can't work normally at any other voltage scope. It require to equip alternating current 220V power supply with the capacity no less than 8kVA. When attaining the above-mentioned scope, x ray machine can work normally. So that the voltage protection can keep x ray machine of its own factors(for example, the power supply regulating mistake, the electric voltmeter misdirection), from the overrun kV exposing and the shortage kV exposing. It can also prevent interference (for example at the same power cable on the circuit, electric appliances starts or closes suddenly).

When this machine use high kV of the 100 mA or 63 mA, if the power network in the short time can't supply the machine more than 37A, and the voltage decline more than 20V electric voltage, it may cause this machine to re-take a sample to compare to the power supply electric voltage. Protection electric circuit may also initiating, this is the normal. Once it take place, it explained too small of the power supply or too long of the circuit from the power supply to the machine and too big of the resistance. If persist usage, only 32 mA and longer time exposing can be applied for attaining expected result.

4. The training of the machine

[Caution]: It is not suggested that pregnant women operate this machine

[Notice]: While machine training, there is x ray output, close the cluster limiter leaden door for protection

After completing the test of zero load, for the new installed machine or the ones stop using over a long period of time (stop using for half an year longer), there is necessity to carry on training.

- 1) Connect all conjunction lines of the machine
- 2) adjust the power supply voltage to red “π”, the upper voltage to the 45V, time at 0.5s
- 3) Turn “mA” option knob to "32" mA, warm up machine for 3 minutes or above, manual exposing. Observe mA gauge, if it works normally, you can hear beeps from the controller; manual control indicator lightening; exposing indicator of the controller lightening.
- 4) Choose the high voltage to the 50 kV. 3 minutes later, carry on exposing once more.
- 5) Choose one level higher of voltage for every exposing, the interval is 3 minutes or above, carrying on exposing until to 90 kV.

[Notice]: When exposing below 70 kV, for training x ray tube, you may expose the machine 2 times at every kV level. While at 70 kV above, for avoiding overheated, every exposing interval must be controlled at 3 minutes or longer.

1) At 65kV level, 1.0s, you can expose the machine 1 or 2 times with "16" mA, "32" mA, "63" mA and "100" mA, so as to check the value of the mA.

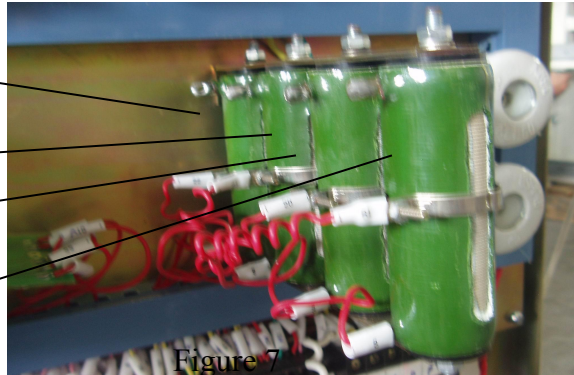
2) When "16" mA, "32" mA, "63" mA and "100" mA shortage or overrun, you can adjust inside the controller the corresponding resistance wreath of the variable electric resistance. See picture 7

16mA resistance

32mA resistance

63mA resistance

100mA resistance



3) You can also adopt several remote controls to expose during the period of experiment, for checking the function of the remote device.

【 Caution 】 According to x-ray tube's characteristics, there must be certain interval time between exposure and next exposure. Although the circuit has set up interval loading time of rest, to prevent x-ray tube and tube assembly overheating, recommended intervals of time are as follows: exposure time < 1 second, interval time > 3 minutes; exposure time > 1 second, interval time > 5 minutes.

The machine can be applied into use after machine training.

5. Remote Control Exposure and Manual Control Exposure

When operating remote control exposing, pre-configure all the parameters (the kV, mA, s, cluster limiter light scope, focusing distance, film size, patient's nidus position, power supply), Then medical technology personnel leave the machine, press the remote control exposing button from a distance within the range about 6 meters. (you can hear beeps while exposing)

Remote control distance \geq 6m

[Notice]

(1) Once pressing remote control button or the manual control button of the switch, do not tremble or release the button until exposing ends, avoiding mistaken action and negative effect on

film quality.

(2) When the x ray machine is shield in the leaden door, operating personnel outdoor, it cant be operated with remote control.

After a period of using with remote control, the remote control distance appears to short. This is normal. Replacing the specified battery will insure the reliability of the remote control operation.

[Warning]: For the sake of the dependable, accurate and valid usage of the x ray machine to take an x film, especially for heavy disease patients, the remote control method is not recommended.

VI. Operation of the Machine

1. Operating the Electric Appliances Part

(1) First thing first, Check the machine control panel buttons & knobs are at zero or at Min.

(2) Turn on power (I), the power supply indicator lightening, the buzzer inside the machine beeps spasmodically.

(3) Regulate “V/kV” option knob to “V”

(4) Tune the power supply voltage making the on board voltmeter indicate 220-230 V. Wait 20s-60s till beeps terminate by itself, turn “mA” option knob, warm up machine for 3 minutes or above.

(5) Operate the cluster limiter(see dynamoelectric cluster limiter operation) to control the radiation scope size for different situation of the patients.

(6) Shut down the whole machine power supply when exposing end.

(7) While burning out a fuse by accident, you can replace the glass tube fuse. The specification of the fuse is RL1-60 20A

(8) If the fuses burning out persists, it’s suggested that the experienced technical expert check the electricity part in the controller and check X-ray tube head damaged or not

2. Operating the Mechanical Part

(1) This machine has a movable cantilever sliding in vertical direction and the pillar can spin ± 45 degree angles, so that it is flexible to adjust the X-ray tube head to appropriate angle & height.

(2) When moving the machine, X-ray tube head should be placed in lowest location, Pillar is revolving to go to 0 degrees locations and locked. Press the locking knob down after the machine

settled, and lightly lift the X-ray tube head to any desired position. (See figure 8)

Tube Head Rotating Brake Spanner

Locking knob

Figure 8



(3) When encountering the obstacles like doorsills while moving the machine, buttress the hand push pole and tread the foot pedal, making the nose cocked. Move forward, then lift the rear wheels over the obstacles.

(4) Brake pedal may be applied to settle the machine.

(5) The function of position control lever: the control is convenient to collimator. There is three shelves lower limit squiggling in the process of moving cantilever from maximum position to minimum position. (See figure 9)



Figure9

Use method: please according to following picture. You must press the position control level when moving cantilever to lower position. (If the cantilever had been fixed, please move it up slightly, and then press the position control level.) As the axis daps from gear, the cantilever will be moved steady to appointed position. Contrarily, if moving cantilevers to higher position, you don't need to press the position control level.

3. The Operation of the Electric Beam Limiting Device

The shadow positioning dynamoelectric cluster limiter of variable visual field machine, has its adjustable visual light field which laps over the x ray radiation area from the X-ray tube head. It's ok to select the film scope & size in line with the visual light field from the dynamoelectric cluster limiter.

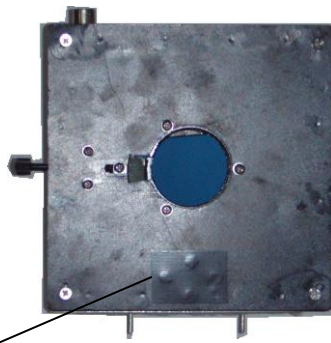
- (1) While turning two switches up or down of the dynamoelectric cluster limiter, it sends up visual light from inside the cluster limiter and the scope & size can be changed continuously.
- (2) The left side switch tunes the visual light field lengthways; the right side switch decides the visual light field breadthways.
- (3) place the “+” of the visual light field aimed at the nidus; tune the left & right switch to adjust the landscape and portrait.
- (4) Adjust the visual light field to adapted for the film size and release the switch. The visual light field shut off automatically in 10-15 seconds or so.
- (5) the visual light field is set to match the x ray exposing scope when manufacturing
- (6) The burnt skin limit pole is designed to limit the distance from x ray focus to the patients skin. Please don't move it at will or for the ambulation and positioning of the X-ray tube head.

4. The Adjustment of the dynamoelectric cluster limiter

The location of the visual light field can be set to match the x ray exposing scope manually, if the visual light field does not appear to match it,

The method is as follows,

Loosen the locking screw; discharge the dynamoelectric cluster limiter; aim the visual light window vertically to the ground, place a paper on the ground; connect the power, turn the switch, making the visual light shining on the paper vertically; insert the cross screwdriver into 4 Φ 5mm visual light tuning holes under the dynamoelectric cluster limiter coping respectively(see figure 10); tune the m3 screws until the 4 visual light field boards matches with the shadow by the 4 boards of the cluster limiter.



visual light tuning holes

Figure 10

5. The procedure of taking a photograph with case study (lumbar vertebrae center of medium-sized body)

- (1) Push the machine to the side of the sickbed; put the X-ray tube head downwards vertically to the patients nidus, aiming at the patients nidus.
- (2) Plug in the AC outlet, connecting power supply.
- (3) Turn on the controller power switch (I), the power supply indicator lightening. the buzzer inside the machine beeps spasmodically.
- (4) Regulate "V/kV" option knob to "V".
- (5) Turn the power supply tuning knob (V), making the voltmeter indicate 220V-230V which is located at red" ▲ ". Wait 20s-60s till beeps terminate by itself,
- (6) Turn "mA" option knob to 63mA, warm up machine for 3 minutes or above.
- (7) Tune the kV knob to 80kV
- (8) Select time 1.6s
- (9) establish the x ray tube focus vertically at 100cm higher above the patients nidus.
- (10) place the x ray film box under the patients lumbar vertebrae
- (11) tune the switch of the dynamoelectric cluster limiter, making the visual light "+" aimed at the patients nidus, regulate the visual light field lengthways and breadthways, making the visual light field larger than x film size. (the lumbar vertebrae 10"× 12")
- (12) wait till the beep ends
- (13) put the manual control 2m away
- (14) Press and hold the manual control button until the beep voice
- (15) shut the controller power switch(O) and place all choice buttons in the minimum after exposing.
- (16) Take out the x ray film box from under the patients lumbar vertebrae

VII. Quality Analysis of Photograph

The rating quality of x ray film (for example A,B,C,) is related to the following factors:

- (1) Whether power supply matches the requirement of this x ray machine or not:(For example, voltage decline no more than 20V)
- (2) The x ray film light-sensitive speed
- (3) The enhanced sensibility screen speed inside the x ray film dark box
- (4) the speed of developer & fixative
- (5) The kV and the mA·s value of photographed sections
- (6) the distance from the x ray tube focus to patients nidus

This machine photographing condition form data provided in the users manual is acquired under the condition that power supply matches original requirement; developer & fixative is normal; enhanced sensibility screen speed is normal. It may differ under the variable situation, especially for that the power supply could not reach the requirement(too much voltage decline using 63mA or 100mA). When it happens, apply to select 32mA and increase the exposing time to assure the mA · s value of photographing.

VIII. Maintenance and System Failure Analysis of Instrument

1. The X-ray tube head cantilever balance adjustment

This machine adopts spring coil balance, the spring coil is subjected to dint biggest. Therefore when the machine is idle, the X-ray tube head should be placed in the max height to insure balance of stability and prolong the service life of the machine.

If the machine head appear to droop, you can lean the whole machine backward carefully; adjust M12 screw poles at the pillar bottom by turning 3-5 circles clockwise with a set of sleeve wrench. (See figure11)

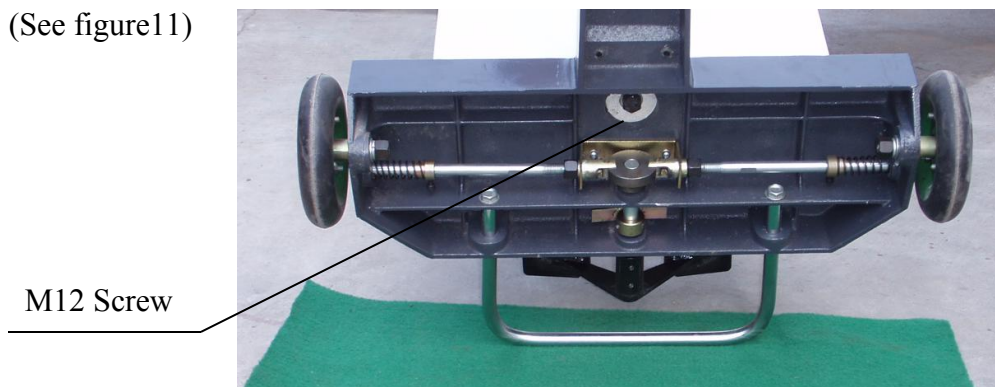


Figure 11

2. System Down Analysis in Brief

Presented malfunction	Analysis	Solution
When turning on the power, no indicator; no indicator of voltmeter	Abnormal power supply It might be open circuit or plug loosening	Check the plug & the outlet; Check the power supply line
When turning on the power, there is no voltmeter signals	Abnormal power supply. It might be lower voltage than 180V and the relay cannot work	Check the voltage supply. Start the machine only when the voltage supply meets the Requirement
After exposing, only power Indicator lightening and the film is too fade to recognize or no image at all The daylight lamp darkened suddenly	Too little of watt; At the exposing moment, the voltmeter declines under 180V	1. Choose the proper watt 2. Change to lower mA for exposing, such as 32mA
Among (16/32/63/100) mA options, some has output while some has not	1. for options with no output, it might be rupture of variable resistance ring 2. It might be damage of the switch	1. Open the anterior door of the controller and check the variable resistance ring. Repair or replace it if damaged. 2. Replace the respective switch
Fuse burning out when exposing	Damage of x ray machine head	1. Ask for maintenance 2. Return to manufacturer for repair

Main Parts List

No.	Code	Name	Specification	Qty	Note
1	RD1, RD2	Fuse	RL1-60/30A	2	Attachment 2
2	RD3	Fuse	SF-10/Ø6×30 10A	1	Attachment 1
3	HL1	LBD (green)	LDDφ5	1	
4	HL8	LBD (yellow)	LDDφ5	1	
5	HL9	LBD (red)	LDDφ5	1	
6	HL10	Cluster limiter lamp-house	AC24V 100W	1	
7	JD	Contactora	CJ020 AC220V	1	
8	JG	High voltage Relay	3TB4317 AC24V	1	
9	JS	Time Relay	JS14A-Y AC24V	1	1 sec.
10	JW	Temperature Relay	HG4197	1	
11	R1~R4	Variable resistor	RXYC-30W 750Ω	4	
12	RT	Break resistor	RXYC-25W 24Ω	1	
13	R6.R7.R31	Resistor	RJ 1/4W 220Ω	3	
14	R9	Resistor	RJ 1/2W 4.3KΩ	1	
15	R10	Resistor	RJ 1/2W 220Ω	1	
16	R11	Resistor	RJ 1/4W 1.1MΩ	1	
17	R12	Resistor	RJ 1/4W 910KΩ	1	
18	R13	Resistor	RJ 1/4W 680KΩ	1	

19	R14	Resistor	RJ 1/4W 510K Ω	1	
20	R15	Resistor	RJ 1/4W 430K Ω	1	
21	R16	Resistor	RJ 1/4W 360K Ω	1	
22	R17	Resistor	RJ 1/4W 270K Ω	1	
23	R18	Resistor	RJ 1/4W 200K Ω	1	
24	R19	Resistor	RJ 1/4W 180K Ω	1	
25	R20	Resistor	RJ 1/4W 130K Ω	1	
26	R21	Resistor	RJ 1/4W 110K Ω	1	
27	R22	Resistor	RJ 1/4W 91K Ω	1	
28	R23	Resistor	RJ 1/4W 68K Ω	1	
29	R24	Resistor	RJ 1/4W 56K Ω	1	
30	R25	Resistor	RJ 1/4W 39K Ω	1	
31	R26	Resistor	RJ 1/4W 30K Ω	1	
32	R27	Resistor	RJ 1/4W 24K Ω	1	
33	R28	Resistor	RJ 1/4W 16K Ω	1	
34	R29	Resistor	RJ 1/4W 11K Ω	1	
35	R30	Resistor	RJ 1/4W 7.5K Ω	1	
36	R40.R42	Resistor	RJ 1/2W 1K Ω	2	
37	R41	Resistor	RJ 1/2W 10K Ω	1	
38	R43.R44	Potentiometer	WS I 1/2W 10K Ω	1	
39	R45	Resistor	RJ 1/2W 51K Ω	1	
40	R46	Resistor	RJ 1/2W 3K Ω	1	
41	R50	Resistor	RJ 1W 75 Ω	1	
42	R51	Resistor	RJ 1/4W 22K Ω	1	
43	R52	Resistor	RJ 1/4W 75K Ω	1	
44	K1	Power source opens switch	KD2-24	1	
45	K2	Power source closes switch	KD2-24	1	
46	K3	Transfer switch	KZS4W4D	1	
47	K4	Exchange switch.	KND 2 \times 2	1	
48	K6.K5.	V/kV switch	SC787 2 \times 2	2	
49	K7.K8.K11.K12	Limit to position switch	JW2-11 AC220V/3A	4	
50	K13	Switch	KHT-2 4 \times 20	1	
51	K14.K15	Electric Beam Limiting Device Switch	KNX 2 \times 2	2	
52	YF	Remote control emitter		1	
53	YJ	Remotely control receiver		1	
54	GB	Remotely control switch battery	6F22 DC9V	1	
55	KJ	Hand control switch	AN24-H	1	
56	HA1.HA2	Buzzer	YMD120951	2	
57	M1.M2	Mini motor	DL 40ZYC DC12V	2	
58	M3.M4	Mini motor	SD09 AC110V	2	
59	X	X-ray Tube	XD4-2.9/100	1	
60	D1~D4	High voltage Silicone Stack	2CL120kV/0.5A	4	
61	mA	DC mA meter	DC 0~100mA	1	
62	V/kV	AC Voltmeter	AC 0~250V	1	
63	VC3~VC6	Bridge Rectifier	QL25B-50V-0.5A	4	
64	VC2	Bridge Rectifier	QL25B-100V-1A	1	

65	C1.C4.C10	Capacitor	CD11 220uf/50V	3	
66	C5	Capacitor	CD11 4.7uf/50V	1	
67	C3.C6.C9.C12	Capacitor	CD11 100uf/50V	4	
68	C7	Capacitor	CD11 220uf/25V	1	
69	C8	Capacitor	CD11 10uf/25V	1	
70	C11	Capacitor	CBB 0.1uf/63V	1	
71	C13.C14	Capacitor	CBB 1.5uf/160V	2	
72	B1	Autotransformer		1	
73	B2	H. V. Transformer		1	
74	B3	Filament Transformer		1	
75	JJ	Relay	JZX-17F-2Z /DC24V	1	
76	D1~D5	Diode	1N4001	6	
77	D12.D13	Voltage Regulator Diode	2CW121	2	
78	D14.D15	Voltage Regulator Diode	2CW37	2	
79	V1	Triode	3DK4B	1	
80	V2	Manostat	7812	1	
81	V3	IC	NE555	1	
82	V4	IC	LM324	1	
83					

Packing List

There are following objects in the case:

1. The bed, cantilever, column, and controller

 There are following objects in the controller deedbox:

- | | |
|----------------------------|---|
| (1) Electric Power Line | 1 |
| (2) Handle Switch and Line | 1 |
| (3) Tube Head Line | 1 |
| (4) Appurtenance Bag | 1 |

There are following objects in the appurtenance bag:

- | | |
|---|---|
| (1) Fuse | 2 |
| (2) Filter | 1 |
| (3) Resistor Clamp | 2 |
| (4) Remote Control Transmitter with One Battery in it | 1 |
| (5) String | 1 |

2. X-ray Tube Head 1

3. Electric Beam Limiting Device 1

4. Document Checklist

(1) Operation Manual 1

