DIGITAL Imaging Creative
POSDION
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REXTAR-X

OPERATION & SERVICE MANUAL

POSDION Co., Ltd.

Room 905, B-dong, Awish-Yedain Building, 452, Yangcheon-ro, Gangseo-gu, Seoul, 07574, Korea
Tel : +82-2-3664-2874, Fax : +82-2-3661-2267
Http://www.posdion.com E-mail: info@posdion.com

Distributed in the USA by: GoodDrs USA
17609 Ventura Blvd. #110
Encino, CA 91316 Toll Free (844)-448-5050

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Certificate of Warranty

Range and terms for warranty

Posdion Co., Ltd. warrants this product without any expense for the malfunctions and faults occurring during standard transportation and operation for one(1) year from the date of purchase. if the purchased date is not clearly confirmed, warranty period is calculated from six months after from the date of manufacture. This warranty does not apply to equipment that is or has been abused, misused, or altered(including opening enclosure or tampering), improperly maintained, subjected to use beyond rated conditions, or damaged as a result of any carelessness or accidents. This warranty does not cover ordinary wear and tear or maintenance. Repairing by unauthorized person or institutes is not applied to this warranty condition.

Requirements for after sales service

If a malfunction or fault occurs, stop using the unit immediately, and check against the related article in this operation & service manual. Posdion Co.,Ltd. is not responsible for indirect harm caused by the unit. Posdion Co.,Ltd. cannot warrant for defect or harm after the warranty period.

Posdion Co.,Ltd

Disclaimer: REXTAR-X is sold with the understanding that the user assumes sole responsibility for radiation safety (as well as any state, provincial, or local regulatory compliance) and that Posdion Co., Ltd., GoodDrs USA, Agents or representatives, do not accept responsibility for :

a) injury or danger to personnel from X-ray exposure,
b) image overexposure due to poor operating techniques or procedures,
c) equipment not properly serviced or maintained in accordance with instructions contains in this publication, and
d) equipment which has been modified or tampered with in any way.

DO NOT OPERATE THIS DEVICE UNTIL YOU HAVE READ THIS MANUAL and reviewed the accompanying materials.

TABLE OF CONTENTS

*Note Updated Safety Unlock Procedure.....28

Part I. OPERATION MANUAL 1

1. Basic Instructions 3

2. Notes to the User 6

3. Storage and Operation conditions 11

4. Caution : Radioactivity..... 12

5. Parts and Components..... 13

6. Specifications 14

7. Name of Each parts..... 20

8. Operation..... 24

9. Operating Instructions 27

10. How to use Battery 35

11. Supplemental Safety Usage Section 37A-F

PART II. SERVICE MANUAL 38

1. Notes to the Users..... 38

2. Regular Maintenance 39

3. Block diagram..... 40

4. Error Code..... 41

5. Circuit Diagrams..... 42

Part III. Calibration Manual.....52

1. Basic Instruction 52

SERVICE REQUIREMENTS 56

User Test and Certificate at the back of this User Manual.....T1-6

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Part I. OPERATION MANUAL

Explanation of symbols

	Refer to instruction manual/ booklet
	General warning sign
	Radiation exposure symbol used on operator console. Lights to indicate that an exposure is in progress. This is accompanied by an audible tone from the console
	Warning: ionizing radiation
	X-ray Source Assembly, Emitting
	Non-ionizing radiation
	Dangerous voltage Dangerous voltage over 1000VAC or 1500VDC.(this symbol is used inside the system.)
	Warning: dangerous voltage
	TYPE B APPLIED PART
	Caution
	Earth (ground)
	Direct current
	Alternating current
IPX0	Non-protected
	The CE Mark is a declaration by the manufacturer that the product complies with the requirements of the applicable European Union (EU) medical device directive and that the product has been subject to conformity assessment procedures as provided in that directive.
	Disposal instruction
	Battery state

	Manufactured Date
	Manufacturer's address
EC REP	European representative
SN	Serial number
	Symbol for temperature limitation
	ON/OFF (POWER)

1. Basic Instructions

1) Outline

REXTAR-X is one of the POSDION battery-powered portable dental series. REXTAR-X is the smallest and most lightweight, yet the most powerful High-Frequency X-ray device on the portable devices market. All X-ray devices in the battery-powered portable devices series are Ripple-free HF-type X-ray generating devices. The REXTAR-X dental-use X-ray device is perfectly designed for medical diagnostic situations requiring ease of use and portability.

2) Features

- Ultra-lightweight, ultra-compact dental-use X-ray generator
- High frequency Toshiba X-ray generator
- High output at 70kV / 2mA
- X-ray function controlled by a single button for convenience

3) Manual

This manual covers all aspects pertaining to product operation and services. The Services Manual also offers information about the main points of installation, as well as on-site adjustment and continuous maintenance of the device.

This manual may not take the place of education certified by a licensed department of medicine or radiology. The following device may only be used by personnel trained in the operation and the diagnostic use of X-ray devices.

Apart from its independent use, the following device may also be used with a portable support device or, in conjunction with a device that may be loaded with an X-ray tube, with a table intended for X-ray use, and a variety of similar types of diagnostic X-ray devices.

4) Attention

This manual is a guide pertaining to the safe use and operation of the REXTAR-X portable X-ray unit. The user of the said device must receive instruction and training in the use of X-ray devices, and may only refer to this manual in the context of said instruction. The proprietor of the REXTAR-X portable X-ray unit has an additional obligation to receive proper instruction from regional officials and ensure that only qualified personnel may operate this device.

There may be latent hazards associated with the use of dental electric equipment and X-ray devices latent hazards. All users and operators of this device must be fully aware of the safety and emergency measures and operation instructions set forth in this booklet.

Each device manufactured by POSKOM Co., Ltd. is certified to comply with safety and health concerns by including restraints on X-ray generation in it's construction **according to United States federal law Article J, Section 1, Paragraph 21 and according to European Union general provision EN60601 for protection against radiation generated from diagnostic X-Ray devices, under IEC601-1-3.** **FDA 510K Cleared Device listing # K132041**

POSDION Co., Ltd. does not accept liability for casualties or losses arising from misuse or abuse of the REXTAR-X portable X-ray unit.

Additional questions concerning safety or miscellaneous matters should be referred to the POSDION Co., Ltd. Service Team or to the regional retailer or distributor.

5) Caution and Warning Signs

Latent hazards may arise through improper use of X-ray devices. Such hazards are noted by warning notices as shown below concerning crucial safety and prevention measures

※ Information ※

The Operation Manual details operation procedures for the safe and efficient use of the REXTAR-X product for X-ray technicians, radiation technician, and other medical institutions using the REXTAR-X X-ray unit.

※ CAUTION※

Failure to comply with the following safety provisions may result in X-rays posing a danger to both the patient and the operator of the device.

2. Notes to the User

1) Machinery

※CAUTION※
This device has not been waterproofed.

The central concern in the design of the REXTAR-X portable X-ray unit is your safety and convenience. However, to better ensure your safety when operating the device, we request your adherence to the following regulations.
This device must be operated only under the supervision of a legally qualified individual.

REXTAR-X was designed to generate radioactive rays, and cannot be used for any other purpose, including transparency.

REXTAR-X is to be used in diagnosis only, and cannot be used for treatment purposes.

REXTAR-X has been designated as a Class II Type B device, in conformance with provisions IEC60601-1, 2.

REXTAR-X may not be altered or manipulated at the discretion of the individual. In the case that such changes cannot be avoided, all inquiries must be directed to the POSDION Co., Ltd. Service Team, or to a retail center licensed for service.

REXTAR-X has been adjusted for the highest level of function. If a product should be discovered defective, immediately turn off the device and report the incidence to the POSDION Co., Ltd. Service Team, or to a retail center licensed for service.

REXTAR-X can be used interchangeably or in conjunction with other devices. If you should desire to link another company's product with REXTAR-X, inquire with the POSDION Co., Ltd. Service Team, or to a retail center licensed for service.
Routinely use a non-acetone based disinfectant wipe (according to chemical manufacturer's recommendations) to disinfect the exterior surfaces of the REXTAR-X in between use on each patient.

REXTAR-X is a maintenance-free product. However, a routine wipe-down with a disinfectant cloth or wipe is recommended between patients, along with a quarterly visual inspection for damage. Make sure the power is off while cleaning. Use a non-acetone based disinfectant wipe or a cloth to wipe the exterior surfaces of the REXTAR-X.

Do not touch a patient during the operation of REXTAR-X.

DISPOSAL.
Do not use household or municipal waste collection services for disposal of electrical and electronic equipment. EU countries require the use of separate recycling collection services.

2) Batteries

※ Caution※

Failure to properly dispose of used batteries may lead to explosions or fire

Each country and region may have differing rules and regulations concerning the disposal of used batteries. Disposal of batteries must follow these regional regulations.

Throwing, taking apart, or having external push are applied to batteries increases the risk of bodily harm, as well as of fire and explosion.

Using batteries not approved by POSDION Co., Ltd. with this device increases the risk of fire and explosion.

Batteries being stored separately must not come into contact with metal. Contact with a metal object will provoke an excessive electrical current that will raise the temperature to such a degree that there is risk of burns or of the battery being damaged.

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Only battery chargers approved by POSDION Co., Ltd. may be used. Other battery chargers pose a risk of damage to both the battery and the device.

Heating batteries or putting them near flames poses a risk of injury, or of explosion and fire.

3) Important Information for Batteries

Steps you can take to extend the life of your Lithium-Polymer Battery.

- Charge Lithium-Polymer batteries fully (preferable overnight) before beginning to use the battery

- Full charge and discharge Lithium-Poly batteries 3-4 times to allow the battery to reach its maximum rated capacity.

- Use the Lithium-Poly battery at least every 2-3 weeks

- Keep Lithium-Poly batteries fully charged when not in use

- Charge Lithium-Poly batteries regularly

- Avoid regularly running Lithium-Poly batteries too low

- Never leave Lithium-Poly batteries discharged for long– the batteries do self-discharge and the charge could drop low enough to damage the battery.

- Keep lithium-Poly batteries out of high heat -high temperatures may cause premature battery failure

- Store Lithium-Poly batteries partially discharged in a cool, dry place if you will not be using the battery for several weeks.

4) Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.
The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95% confidence level was applied.

Conducted emission measurement (K=2, 95%)
150 ㎑ ~ 30 ㎒: +2.74 [㏈㎶]
150 ㎑ ~ 30 ㎒: -2.80 [㏈㎶]

Radiated Emission measurement(K=2, 95%)
30 ~ 200 ㎒: 10 m: +5.62 [㏈㎶/m], -5.64 [㏈㎶/m]
200 ~ 1000 ㎒: 10 m: +5.48[㏈㎶/m], -5.50 [㏈㎶/m]

Summary of Test Results

Standard	Test Item Results	Results
EN55011 2009/A1:2010	Conducted Emission	Complied
EN55011 2009/A1:2010	Radiated Emission	Complied
EN 61000-3-2:2006/A1/A2:2009	Harmonic Current	Complied
EN 61000-3-3:2008	Voltage Fluctuations and Flicker	Complied
EN 61000-4-2:2009	Electrostatic Discharge	Complied
EN 61000-4-3:2006/A2:2010	Radiated RF Immunity	Complied
EN 61000-4-4:2004/A1:2010	Electrical Fast Transient/Burst immunity	Complied
EN 61000-4-5:2006	Surge Immunity	Complied
EN 61000-4-6:2009	Conducted RF Immunity	Complied
EN 61000-4-8:2010	Magnetic Field Immunity	Complied
EN 61000-4-11:2004	Voltage dip/interruption	Complied

Performance of Criteria
General performance criteria of EN/IEC 60601-1-2, Section 36.202.1j
The equipment or system shall be able to provide the essential performance and remain safe.
The following degradations associated with essential performance and safety shall not be allowed:

- component failures;
- changes in programmable parameters;
- reset to factory defaults (manufacturer's presets);
- change of operating mode;
- false alarms;
- cessation or interruption of any intended operation, even if accompanied by an alarm;
- initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm;
- error of a displayed numerical value sufficiently large to affect diagnosis or treatment;
- noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals;
- artifact or distortion in an image in which the artifact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals;
- failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

a. Conducted Emission

The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.

b. Radiated Emission

Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

c. Harmonic Current

This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.

d. Voltage Fluctuations and Flicker

The test circuit consists of a test supply voltage, reference impedance, the equipment under test and a flicker meter compliant with IEC 60868. The equipment shall be tested in the condition in which the manufacturer supplies it.

e. Electrostatic Discharge

The test is intended to demonstrate the immunity of equipment subjected to static electricity discharges from operators directly and to adjacent objects. The tabletop equipment under test is placed on a wooden table, 0.8m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.

f. Radiated RF Immunity

The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 80 MHz to 2500 MHz. The interference is applied on the enclosure of the equipment by using transmitting antennas.

g. Electrical Fast Transient/Burst immunity

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.

h. Surge Immunity

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.

i. Conducted RF Immunity

Measurements were made on a ground plane that extends 0.5-meter minimum beyond all sides of the system under test. The EUT was located 10cm above the reference ground plane and any associated I/O cables attached to the EUT were located between 30mm and 50mm above the ground plane. The indicated field was pre-calibrated prior to placement of the system under test.

j. Magnetic Field Immunity
Measurements were made on a ground plane that extends 1-meter minimum beyond sides of the system under test. Tabletop EUT is located 80cm above the reference ground plane and floor-standing EUT is located 10cm above the reference ground plane. The indicated field was pre-calibrated prior to placement of the EUT under test.

k. Voltage dip/interruption
The product was subjected to voltage dips and interruptions. Testing was performed with the product connected directly to a generator capable of simulating the voltage drops and interrupts as described.

3. Storage and Operation conditions

1) Storage

This device must NOT be stored:

- ◈ In direct light.
- ◈ In overly dusty environments.
- ◈ In high humidity.
- ◈ In poor ventilation.
- ◈ In highly saline environments.
- ◈ With chemicals or gases.

2) Operation conditions

To maintain the device's high function and performance, avoid overly strong vibrations and maintain the appropriate environmental conditions.

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Conditions tolerated by the device

Temperature range	10°C ~ 30°C (50°F ~ 86°F)
Humidity Range	30% ~ 75%RH
Atmosphere Range	700 ~ 1060hPa

Optimum operating conditions

Temperature range	17°C ~ 23°C (62.6°F ~ 73.4°F)
Humidity Range	40% ~ 60%RH
Atmosphere Range	700 ~ 1060hPa

3) Storage and Transportation Conditions

For safe storage and transport, the device must be stored within the temperature and humidity conditions specified below.

Conditions for Storage and transport

Temperature Range	-25°C ~ +60°C (-13°F ~ +140°F)
Humidity Range	10% ~ 95%RH
Atmosphere Range	500 ~ 1060hPa

4. Caution:

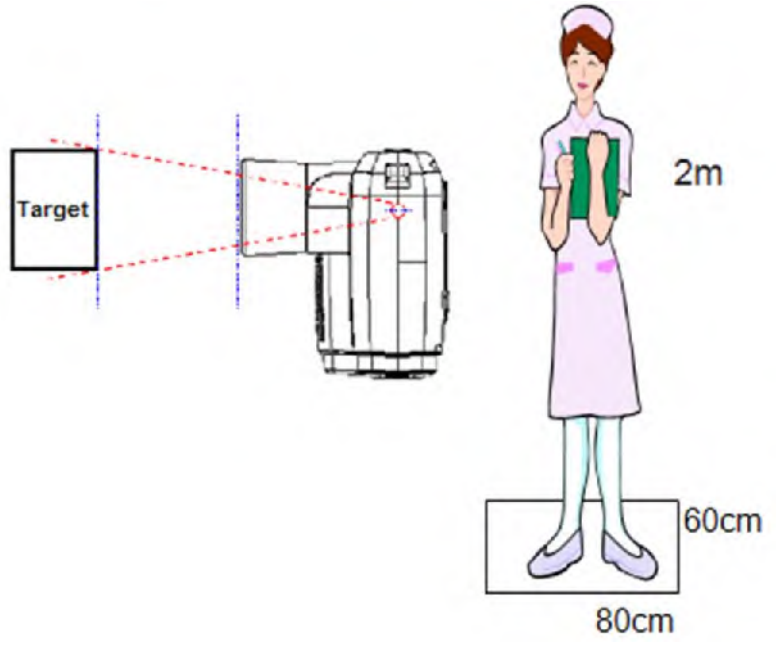
※CAUTION※

Ionizing radiation may pose a significant hazard to both the patient and the operator if safety rules are not strictly followed

1) The user and/or the operator must be wearing the appropriate clothing and safety devices.
2) The user must distance himself or herself from the origin point of radiation and from secondary exposure to radiation.
3) All unnecessary items must be removed from the vicinity of radiation.
4) Any experiments must be performed at the lowest possible value of sec (Exposure Time).
5) Care must be taken to not exceed levels of radiation designated safe for each particular site.

※CAUTION※

This x-ray unit may be dangerous to operator and bystander unless safe exposure factors and operating instructions are observed.
Keep in mind that optimal radiation protection to the operator exists within a zone of significant occupancy (the place behind the device – 60cm[Width] x 80cm[Length] x 200cm[Height]).
All personnel authorized to operate the equipment should be fully acquainted with safety recommendations and established maximum permissible doses.



Comply with all relevant guidelines dictated by your in-house radiation protection program in regard to patients and operators who are pregnant or expect to become pregnant. In implementing a radiation protection program, please consult any state, provincial, and local regulations governing radiation protection and the use of x-ray equipment. Ensure proper registration and compliance with any such regulation.

5. Parts and Components

REXTAR-X is an X-ray device for medical use. This device may be applied to diagnostic purposes, and must be operated by a licensed dentist. The user must follow health and safety regulations relating to electric and chemical safety, and the safeguarding of medical equipment with ionizing potential.
The REXTAR-X product is composed of 1) the REXTAR-X parts listed below.
Each and every part must be securely in its place and properly assembled for the device to operate normally.

1) REXTAR-X main body parts

- ◈ High Voltage Tank, including X-ray tube
- ◈ Board (built-in PCB type)
- ◈ Battery Pack

2) REXTAR-X components parts

- ◈ REXTAR-X main body
- ◈ Back-Scatter safety Shield*
- ◈ Cone 2 (140mm)
- ◈ Neck-belt to be attached to the main body
- ◈ Hand Strap
- ◈ Carrying bag
- ◈ Operation and Service Manual
- ◈ Battery charger
- ◈ Power code
- ◈ Hand Switch (=Remote controller, Optional)

* Back-Scatter Shield is 12mm thick, x 6" in diameter and has a lead equivalence of 0.5 or greater mmPb

6. Specifications

Classifications :

Type of protection against electric shock : Class II / Internally Powered Equipment

Degree of protection against electric shock : Type B Applied part

Degree of protection against the ingress of water : IPX0

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

Degree of safety in the presence of a flammable anesthetics mixture with air or with oxygen or with Nitrous oxide : Not suitable for use in the presence of a flammable anesthetics mixture with air or with oxygen or with nitrous oxide.

Intermittent Operation : 70kV / 2mA / 1.3sec, After one exposure, 10 sec wait

Statement of reference loading conditions : 70kV / 2mA / 1.3sec

1) Device Specifications

Items		Specifications
Input Specifications	Device Power Source	19 VDC 3.16A
	Charger Power	Chicony Power Technology Co., Ltd., Model No.:CPA09-004A, 100-240 VAC, 50-60Hz 1.5A
Output Specifications		140 W
Device Power Source		11.1 VDC (Battery)
Battery		11.1 V (Lithium-Ion Polymer)
Frequency		70kHz
kV, mA		70 kV / 2 mA (fixed)
X-ray Exposure Time range[sec]		0.01 ~ 1.30 sec (43 Step) (0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24, 0.26, 0.28, 0.30, 0.32, 0.34, 0.36, 0.38, 0.40, 0.42, 0.44, 0.46, 0.48, 0.50, 0.55, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1.00, 1.10, 1.20, 1.30)
Max. tolerance	kV	± 7%
	sec	± 10%
Display		LCD Panel Display (3.5 Inch, BTN LCD, 1/4Duty, 1/3BIAS)
X-ray Tube	Model name	Toshiba D – 041
	Inherent Filtration	Min. 1.0mm AL Eq.
	Focus	0.4 mm

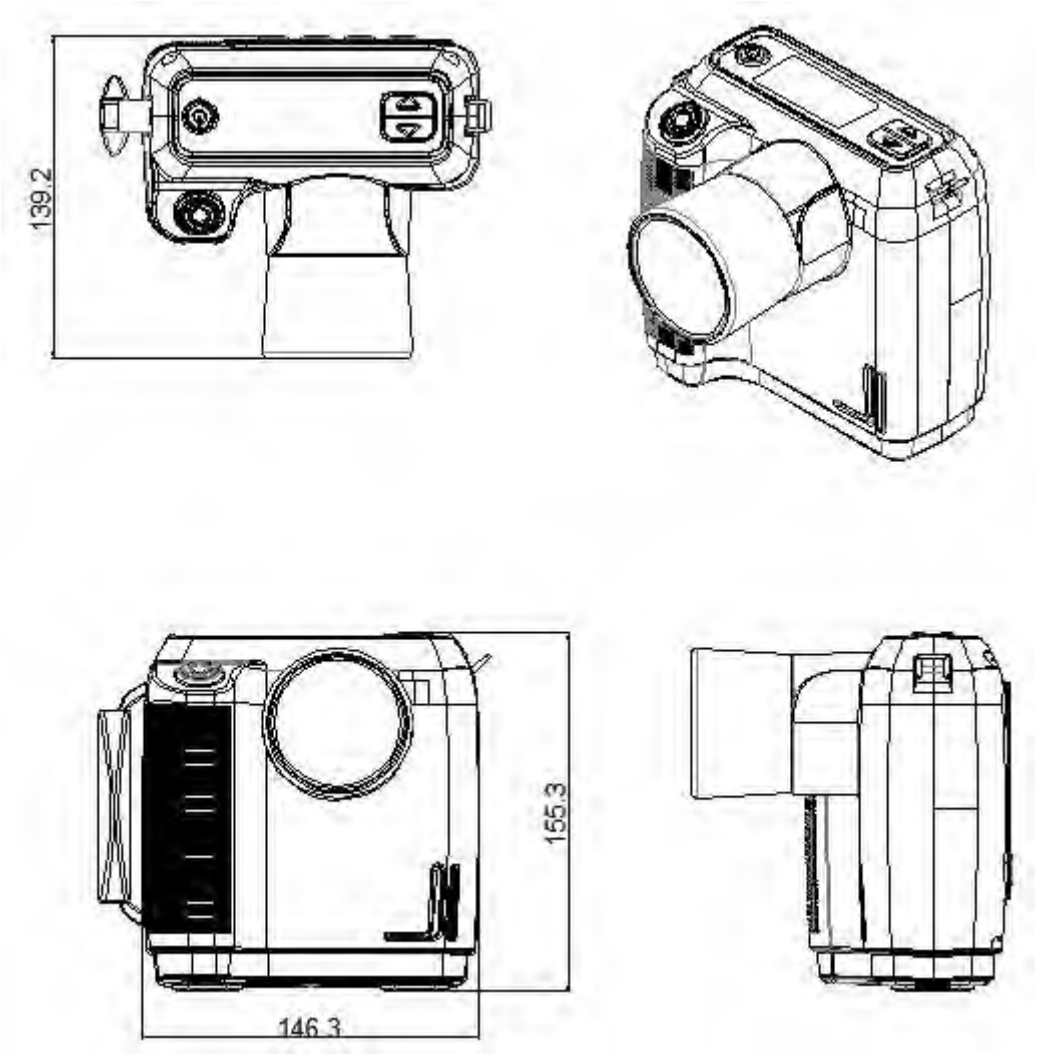
Items		Specifications
Total filteration	Tube Inherent Filtration	1.0mmAL Eq.
	Addition Filtration	0.5mmAL
	Total	1.5mm AL Eq. @ 70 kV
Size		146×155×139mm
Weight		2 kg (main body+built-in Battery)

< Table1.6.1.1 Device Specification >

* Back-Scatter Shield is 12mm thick, x 6" in diameter and has a lead equivalence of 0.5 or greater mmPb

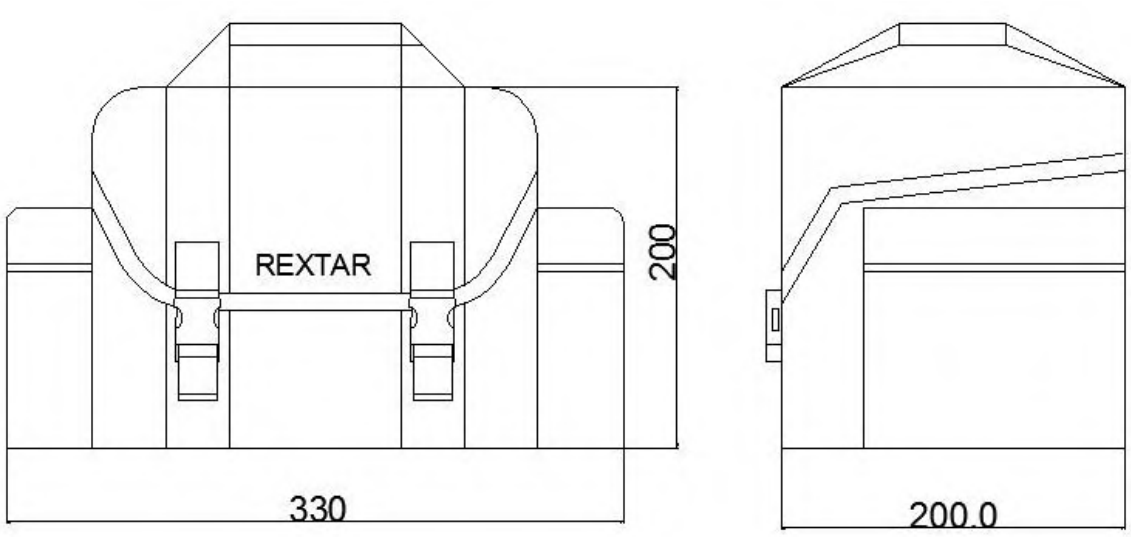
2) Measurement of Main body and components

(1) Main body



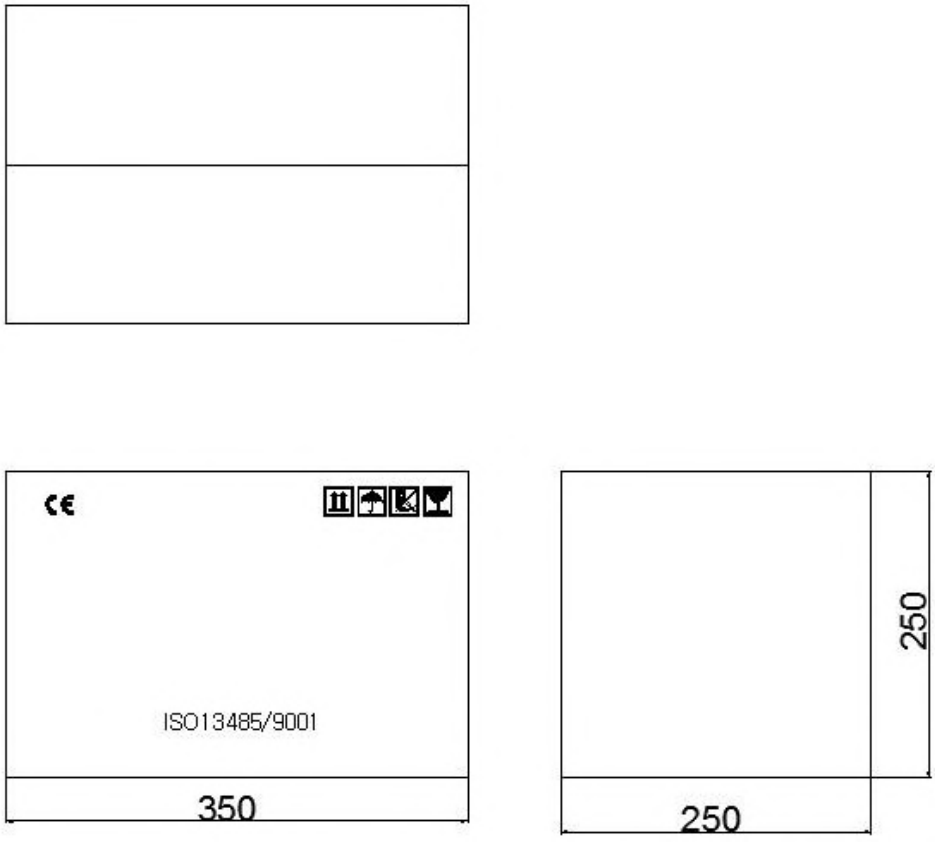
< Pic1.6.2.1 Main body>

(2) Carrying bag



< Pic1.6.2.2 Carrying bag>

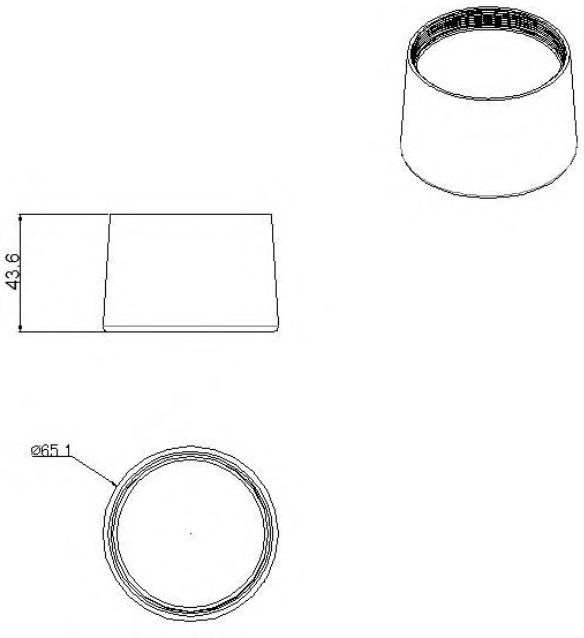
(3) Packing BOX



< Pic1.6.2.3 Packing BOX >

(4) Short Cone1 (40mm)

(For Export outside of the USA)

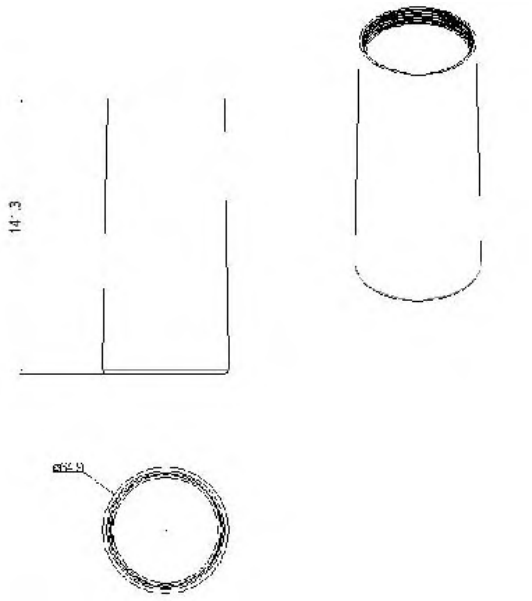


< Pic1.6.2.4 Cone1 (40mm) >

*Note 40mm Cone is for Export outside of the USA only

Long Cone 2 (140mm)

(For Sale with-in the USA or as requested)



< Pic1.6.2.5 Cone2 (140mm) >
(Lead lined)

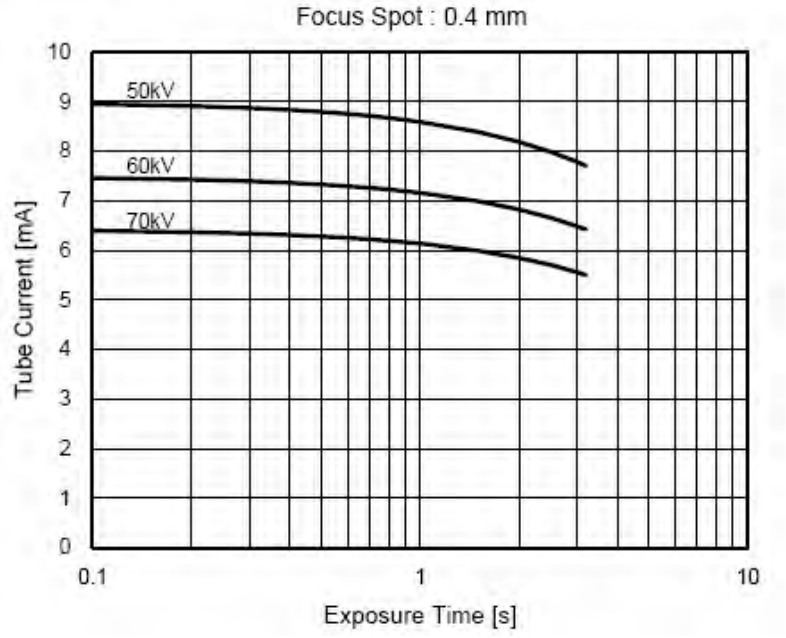
* Includes Back-Scatter Shield is 12mm thick, x 6" in diameter and has a lead equivalence of 0.5 or greater mmPb

3) X-ray Tube Specification

(1) Basic Specification

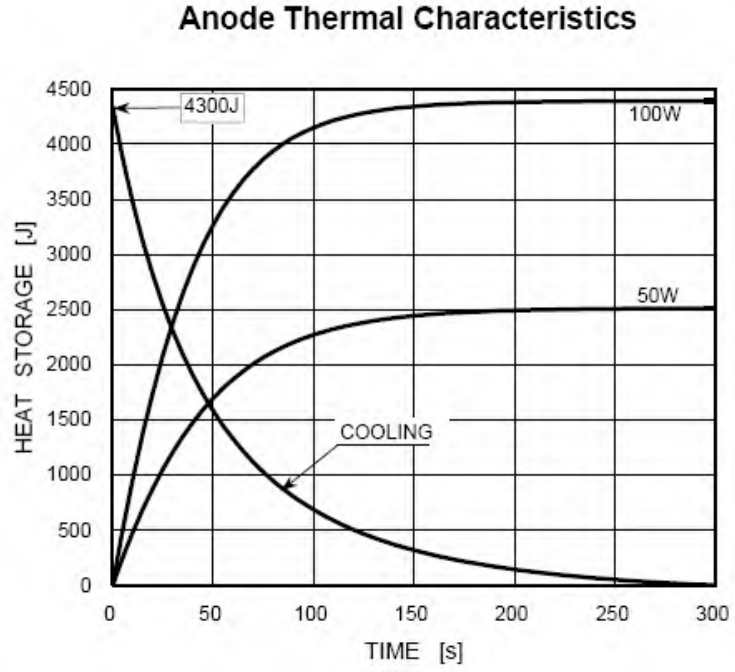
Model name(Manufactured by) : D – 041 (TOSHIBA)
Voltage Range (Maximum Voltage) : 50 ~ 70kV (77kV)
Focal Spot Size : 0.4 × 0.4mm
Input Electrical Power (per second) : 430W
Anode Heat Radiation Index: 4300J
Maximum Rate of Anode Heat Exhaustion : 100W

(2) Graph of Maximum Output



< Pic1.6.3.1 X-ray Tube Max. output >

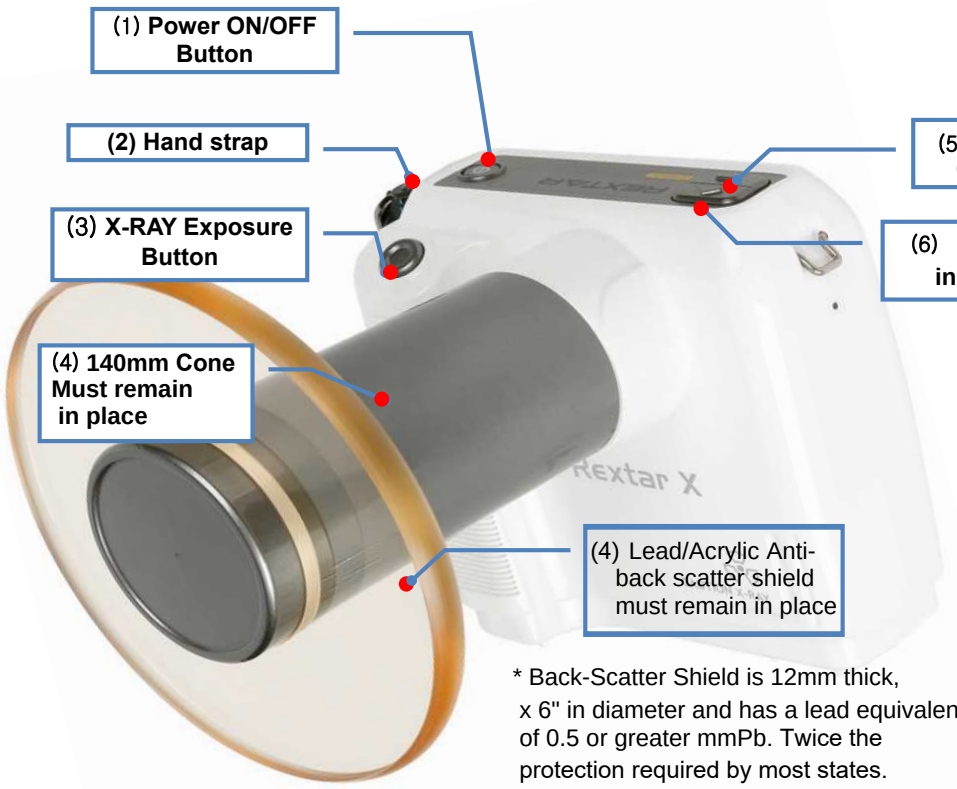
(3) Anode Thermal Characteristics Curve



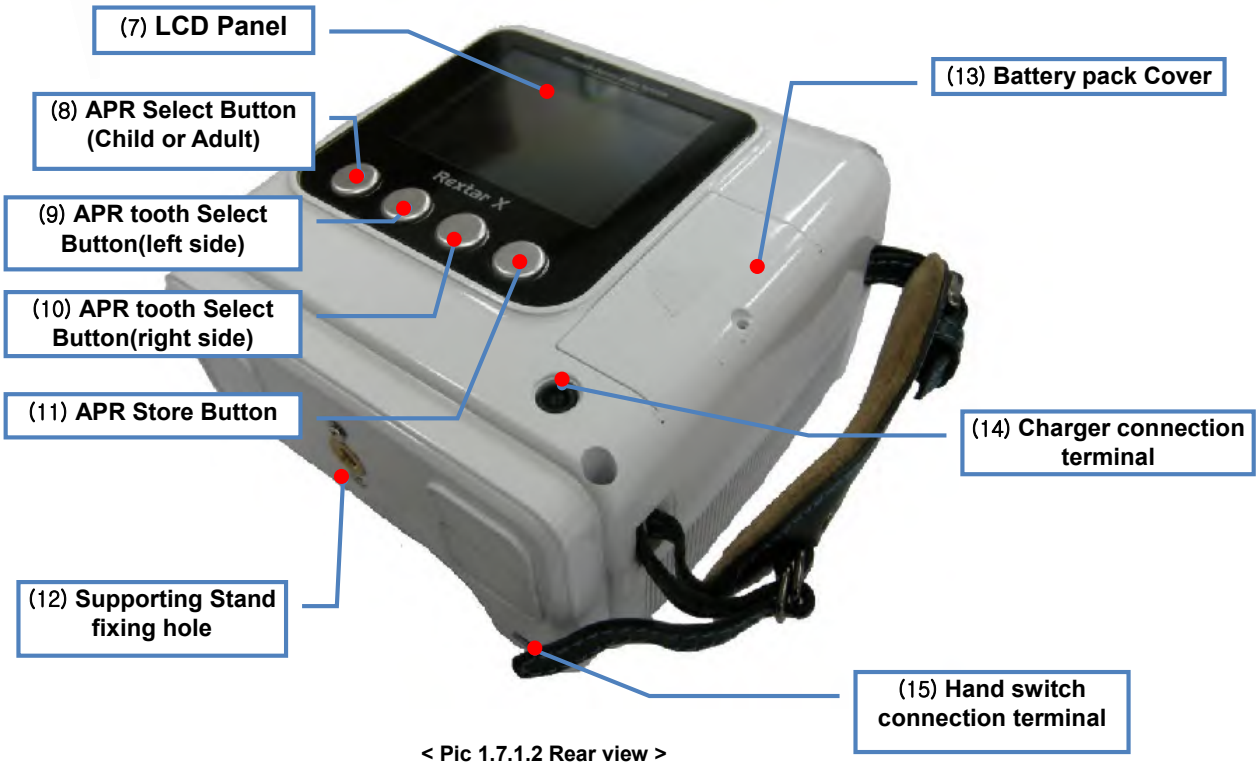
< Pic1.6.3.2 Heat Characteristic Curve of X-ray Tube Anode >

7. Name of Each parts

1) Main body



* Back-Scatter Shield is 12mm thick, x 6" in diameter and has a lead equivalence of 0.5 or greater mmPb. Twice the protection required by most states.



< Pic 1.7.1.2 Rear view >

(1) POWER ON Button

Power Of/ Off button .
Turned on when you push in OFF state, and turned off when you push in ON state.

(2) Hand Strap

Used for easy operation when you hold REXTAR-X.

(3) X-ray Exposure button

Using to control the X-ray emission of REXTAR-X.

If you stop pushing the exposure button before the exposure ends, the x-ray emission interrupted.

(4) Cone 140mm

Extended lead lined 140mm cone and lead/acrylic see through anti-scatter shield must remain in place. Do not use if removed, or damaged in any way.

(5) Exposure time decrease button

Select exposure time for X-ray exposure.
Max exposure time : 0.01 sec

(6) Exposure time increase button

Select exposure time for X-ray exposure.
Max. exposure time : 1.30 sec

(7) LCD Panel

Available to check REXTAR-X state.
- Firmware Version – Displayed when POWER ON
- Battery Leftover display
- Display exposure time and APR technique

(8) APR Select Button(Child or Adult)

Select the APR mode (Child or Adult)

(9) APR tooth Select Button (left side)

Move and Select the APR tooth mode(left side)

(10) APR tooth Select Button (right side)

Move and Select the APR tooth mode (right side)

(11) APR Store Button

Store the changed APR data

(12) Supporting stand fixing hole

Center point for fixing REXTAR-X main body to the supporting stand.
Combine it with fixing slot on Supporting stand in center

(13) Battery Pack Cover

Cover for battery attach/detach.

Battery cannot be disassembled or separated at your discretion.

(14) Charger connection terminal

Charger plug terminal for battery charging.
Only enclosed charger should be used.

(15) Hand switch connection terminal

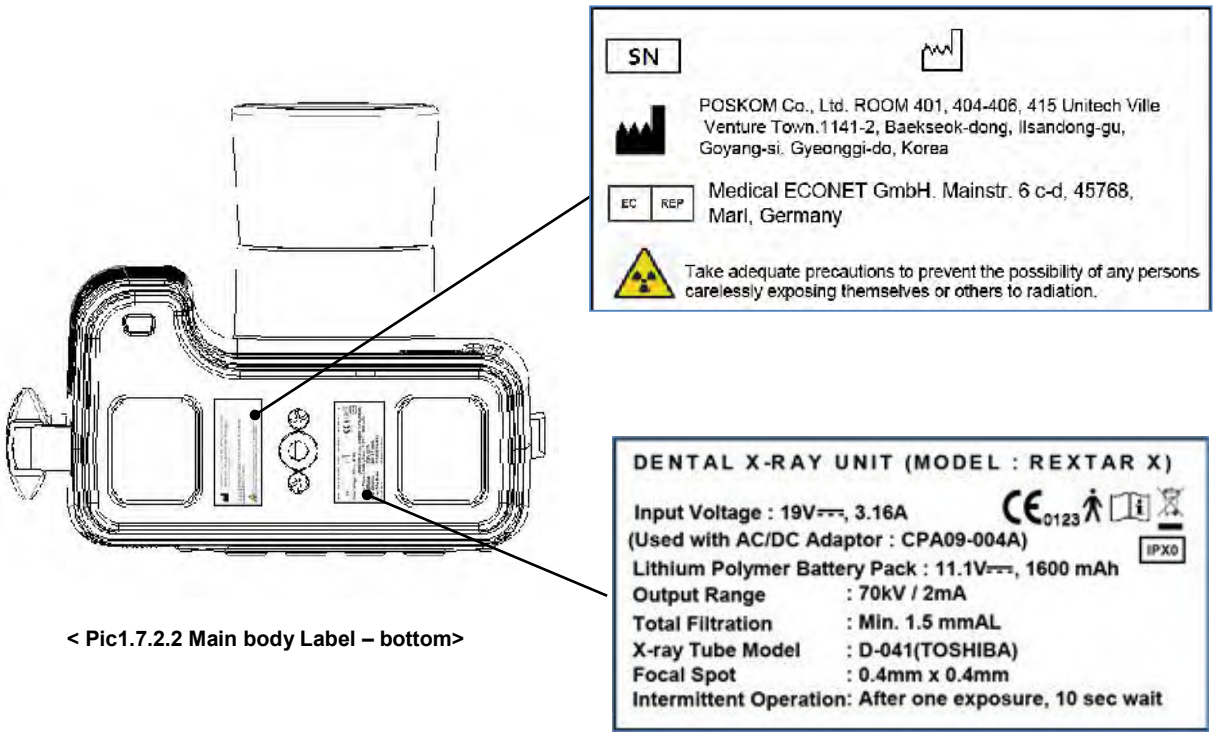
Terminal for connect with hand switch.

(16) Back-Scatter Shield is 12mm thick, x 6" in diameter and has a lead equivalentcy of 0.5 or greater mmPb

2) Label

(1) Model name label

(2) Main Label



< Pic1.7.2.2 Main body Label – bottom>

(3) Tank Label

< Pic1.7.2.3 TANK Label – bottom>

8. Operation

1) Prepare for Operation

(1) Lead aprons must be worn by patients during Exposure.

(2) In order to minimize the time required per session and gain the best results, the device must be kept from being shaken or otherwise disturbed when pressing the exposure button.

(3) In order to set the wanted sec value free of error, pay attention to the decimal point when setting the sec value. Be sure that the leaded scatter shield is in place.

(4) Visitors must be sent outside of the room while X-RAY filming patients.

(5) Close and continuous attention must be paid to the maintenance of the device.

(6) Accumulation of radiation should not exceed the maximum recommended level.
Especially if long time intervals are often used, it is necessary that an expert assess the situation and determine if the user needs to take any extra protective measures.

※ WARNING ※

It is imperative to check that the frequency and voltage of power feeding equipment follow specifications written on the system labels affixed to the body of the device.
Voltage must be within ±10% of the normal level.

2) Pre-Heating

(1) Outline

All portable X-RAY devices require preliminary preparatory measures such as written below.
Pre-heating is a necessary step to protect the X-RAY tube from a sudden increase in electric current flow, and for the safe continued use of the device.
X-RAY tubes must be pre-heated in the following circumstances.

◈ During installation or on the first use

◈ At low temperatures, when at least 1 month has elapsed since the device's last use

◈ When the temperature of the X-RAY tube is at 0°C(32°F) or below

(2) How to preheat X-ray Tube

It is recommended that pre-heating follow the procedure outlined below.

◈ Install the device in a place free of radiation.

◈ When the outside temperature is 0°C or below, bring the device indoors and warm it up.

◈ Conduct X-RAY exposure as written below at 15 second intervals to pre-heat the filaments of the X-RAY tube.

a. First : expose 5 times at 0.10 sec
b. Second : expose 5 times at 0.30 sec
c. Third : expose 5 times at 0.80 sec

※ CAUTION※
During X-RAY exposure, the device will emit a series of beeps. Once X-RAY exposure is complete, do not manipulate the exposure button during Wait Mode.

9. Operating Instructions

1) REXTAR-X POWER ON/OFF

Push and hold the power button for 3 seconds to turn ON the power.
And the power may turned OFF by the same way as above.

When power turned ON,
Firmware version displays on the LCD panel as below.

(1) Firmware Version
Version id displayed with 'XX.XX'

※ NOTICE ※
In charging and POWER ON state, only 'Chr' will be displayed on LCD Panel, but no process as above, If you remove charging adaptor, and power on, it will work normally as above.

※WARNING※
If you see Error Code when you POWER ON and you are not available to use the unit, please do not take any action at your discretion and ask help or inquire to Good Drs.

2) Exposure time control

Exposure time control is available by push the increase/decrease buttons.
However, in charging state or during X-ray exposure not available to control time.

Exposure control time is 0.01 ~ 1.30 sec (43 Step).

(0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24, 0.26, 0.28, 0.30, 0.32, 0.34, 0.36, 0.38, 0.40, 0.42, 0.44, 0.46, 0.48, 0.50, 0.55, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1.00, 1.10, 1.20, 1.30)

※ NOTICE ※
If you keep pushing time control button, Step moves faster.

*Built-in Safety Trigger - 2 step delay action.

To prevent accidental and unwanted exposures, you will press and hold the Exposure button for 1 second to unlock. Then with-in 5 seconds, the exposure button must be pressed and held down continuously to start the exposure cycle. Continue pressing the button until the "Beeping" sound stops. Release of the button too early will cause an error code to display and you will need to start the exposure cycle over again. Remember, once you press the exposure button once to unlock, you have 5 seconds to again then press and hold to take your image, or it will time out and you will have to restart the Unlock cycle again.

3) X-ray Exposure Operation Instruction

※ NOTICE ※

X-ray exposure is controllable with one button.
Keep depressed til the x-ray emission light goes out and the beep sound stops.

(1) Prepare the X-ray exposure

By pushing Exposure Button, you can start X-RAY Exposure.

If 'Chr' message displayed on the LCD panel, it means 'Battery charging'.
X-RAY Exposure cannot be performed during charging.

※ NOTICE※

After confirming the normal state, you need to proceed with the X-ray exposure.

When the battery is LOW [btLo] or charging [Chr], X-RAY Exposure cannot be performed. Proceed with Exposure only after battery had been fully charged and disconnect from the charger.

(2) Ready to X-ray Exposure

< Pic1.9.3.2 Ready to X-ray>

< Time to complete preparations: 2 seconds >
After '(1) Prepare the X-ray exposure',
The READY indicator lights up on LCD panel.

(3) X-ray Exposure

※ NOTE※
If the Exposure button is released before the device goes into standby mode, the device goes into X-RAY Exposure cancellation state, and X-RAY Exposure is cancelled.

< Pic1.9.3.3 X-ray exposure >

< X-RAY Exposure time range:0.01~1.30sec >

Keep pushing Exposure button in '(2) Ready to X-ray Exposure', X-ray will be exposed when the X-ray emit indicator lights up on LCD panel and listen for the beeping sound.

During Exposure, keep pushing until the X-ray emission light goes out and the beep sound stops.

If the Exposure button is released before the Exposure is over, Exposure will be immediately stopped, and Err9 will be displayed on LCD panel. Error 9 is caused when you push X-ray Exposure release before Exposure setting time.

(4) Standby state after X-ray exposure

< Pic1.9.3.4 Standby State >

< Standby time after exposure: 5sec >
'(3) X-ray Exposure' is finished, beep sound will stop and Standby indicator lights up on LCD panel.

.

(5) Stand-by Complete

※ NOTE※

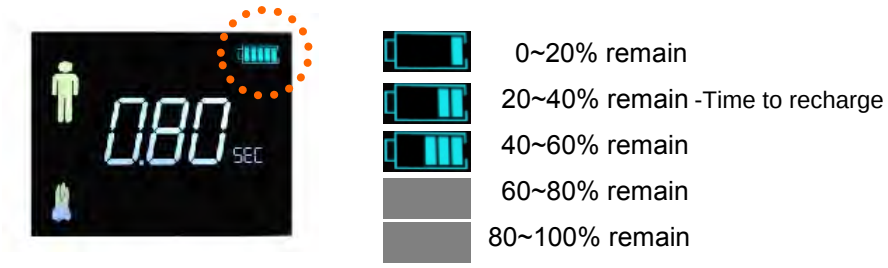
In order to protect the X-RAY tube, the Exposure button must be released after each Exposure conducted to allow the next Exposure conduct. During standby, the Exposure button must be released. Standby will only be concluded once the Exposure button is released.

'(4) Standby state after X-ray exposure' is completed, Standby indicator will light off.

Exposure will be completed when you release Exposure switch push after X-ray exposure.

4) How to check Battery leftover

You can check the battery level after the Rextar-X is turned on.
Battery level indicator lights up on the upper right corner of the LCD panel



< Pic1.9.4.1 Battery state >

5) How to set APR function

(1) Start to APR function SETTING MODE

Push the APR MODE Switch button longer than 3 seconds what you want to set among four APR mode Switch buttons on the REXTAR-X.

Four APR MODE switch buttons are individual APR function memory space.

< Pic 1.9.5.1 Start to APR function SETTING MODE>

(2) APR function SETTING MODE

< Pic 1.9.5.2 APR function SETTING MODE >

< Pic 1.9.5.3 APR function SETTING Mode2 >

If the APR function SETTING MODE is translated into action, pictures of the human and tooth which are selected will be flickered and APR MODE switch function will be changed.

(3) APR function SETTING (APR human size selection)

< Pic1.9.5.4 APR human size selection >

This switch button is for selection between adult and child.

If you push the switch button, the pictures of adult and child will be changed.

Selected human size will be appeared on the LCD.

(4) APR function SETTING (APR tooth selection)

< left>

< right>

This switch button is for selection of tooth.

Select the kind of tooth by pushing the left / right button.

Selected tooth will be appeared on the LCD.

(5) APR function SETTING (APR SEC selection)

This switch button is for SEC. selection.

Select SEC. by pushing the UP / DOWN switch.

Selected SEC. will be appeared on the LCD.

(6) Finish to APR function SETTING (APR memory)

This switch button is for APR memory.

Push the button longer than 2 seconds after selecting the human size, tooth, SEC.

If the setting is finished, there will be buzzer sound two times and APR setting mode will be finished automatically.

6) Others

(1) Error Code

Error Code	Description
Error 1	Hardware Error (Voltage, current error)
Error 3	Exposure Timer Error (When exposure is over the set exposure setting time)
Error 21	Thermal Error (When inside temperature of TANK is over than setting temp.) (V(Let cool down for a few minutes)
Error 9	Exposure Cancel (When X-ray exposure button is released before exposure setting time)

(2) Charging State

In POWER ON state, you can see 'Chr' on LCD panel.

(3) Auto POWER OFF function

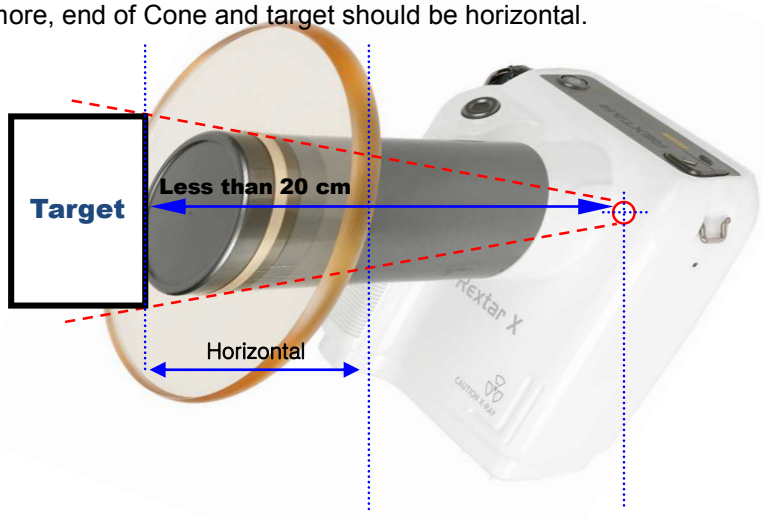
If there is no buttons pushed during **3 minutes,** REXTAR-X **will be turned OFF** to save battery .

(4) Exposure recommendation

To operate REXTAR-X, you can hold "Hand Strap' of device with one hand, and you can manipulate Exposure time control button with another hand.

At only 2mA, the Rextar X is extremely low dose and we recommend having the end of the cone as close to the receptor as possible.

Furthermore, end of Cone and target should be horizontal.



< Pic1.9.5.1 Exposure recommends >

10. How to use Battery

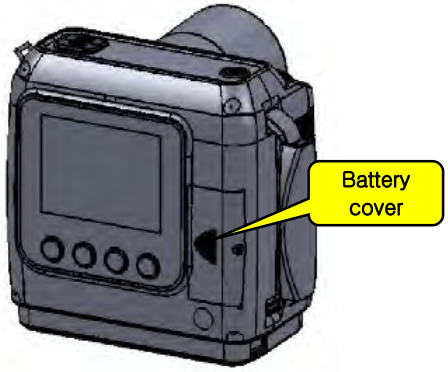
1) How to attach/detach Battery

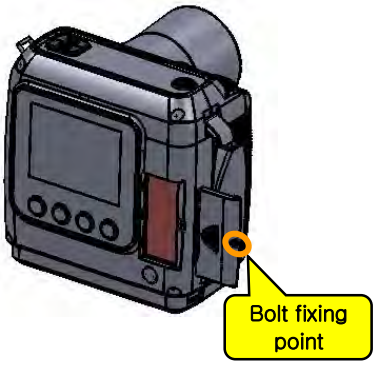
※ NOTE※

Batteries should only be detached when being replaced.
Overly frequent detachment causes reduced battery life.

When detaching the battery cover, the **2.6 PIE six-sided bolts affixing the cover must also be removed.

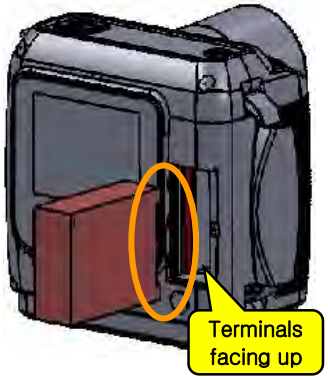
(1) Battery is located on the bottom side of main body.





(2) Detach the battery cover after removing the six-sided bolts.

(3) Detach the battery pack.



(4) Dispose of the detached battery pack in the way best applicable to the user.

(5) A new battery pack must be inserted with the terminals facing up (shown at left), and mounted in an order reverse to what is shown above (4) → (3) → (2) → (1).

※ Caution※

Failure to properly dispose of used batteries may lead to explosions or fire

2) Charging Batteries

To charge batteries, connect the Battery Charger to the Battery Charger Connection Terminal.
Battery Charger can be directly connected to the Battery Charger Connection Terminal.

(1) AC/DC Adaptor

< Pic 1.10.2.1 AC/DC Adaptor >

(International export plug shown)

< Pic 1.10.2.2 AC Plug >

< Pic 1.10.2.3 DC Plug >

(2) Adapter Connection

DC Plug connects directly in the REXTAR-X main body.

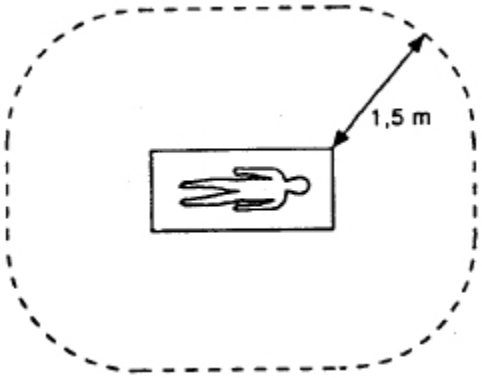
< Pic 1.10.2.4 AC Plug Outlet connection >

< Pic1.10.2.6 DC Plug connection >

※ INFORMATION ※
Battery charge time: 5 hours after complete discharge
If the Remaining Battery Life Display is less than 40%, the battery should be charged.

3) Charging Precautions

Charge was 1.5 m of outside the Patient Environment to Medically used room.



※ Caution ※

1.5m-access areas outside the charge to the patient.

4) Battery Use Cycles

Batteries wear down with use. Old batteries must be recharged more often. When the length of time a battery could function after each charging has shrunk to half or less compared to when the battery was new, it is time to replace the battery.

When storing batteries for extended periods of time, charge them before storing.

(Remove these batteries if equipment is not likely to be used for some time)

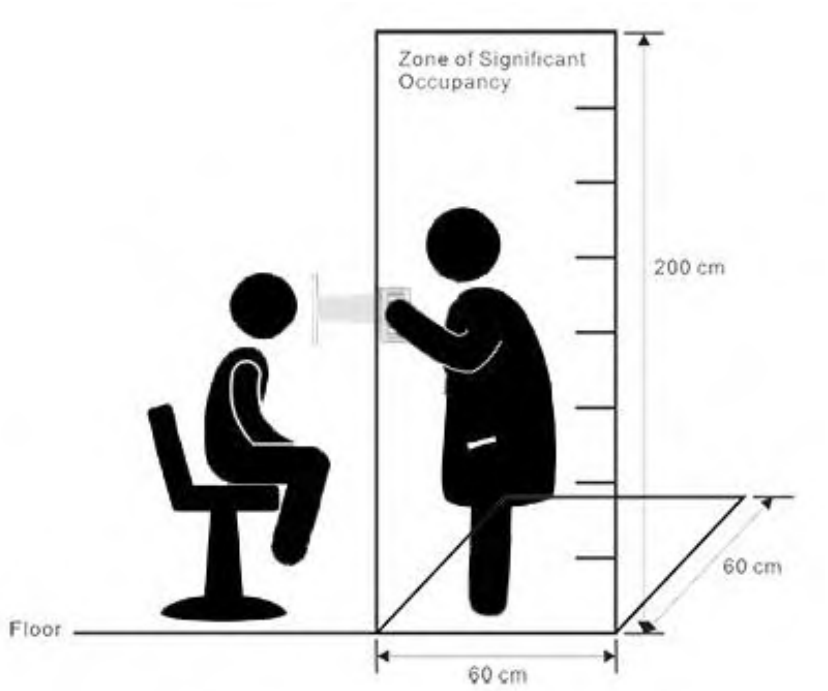
※ Information ※

When device is not in use for extended periods of time, the battery should be stored only after being completely charged, and should be recharged every 6 months to slow the degradation process.

Zone of Significant Occupancy** ***Supplemental Pages

Rextar X requires the presence of an operator, with at least one significant zone of occupancy with a floor not smaller than 60 × 60 cm wide, and not shorter than 200 cm height, including the logical information as follow.

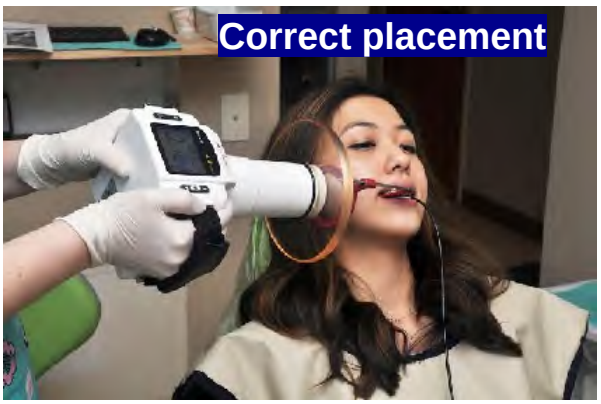
1) The type of radio examinations the significant zone of occupancy is only designated to be used for its main purpose.
2) Location of the significant zone of occupancy includes the positions of its boundaries, and is relative to the clearly recognizable features of the X-ray equipment.
3) Identity of the removable protective devices for use with X-ray equipment and information on their application and use.



Radiation Safety

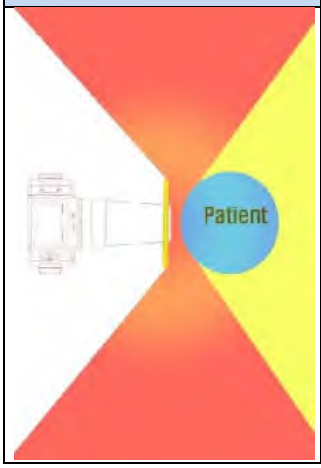
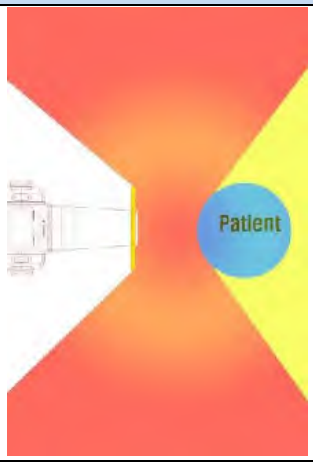
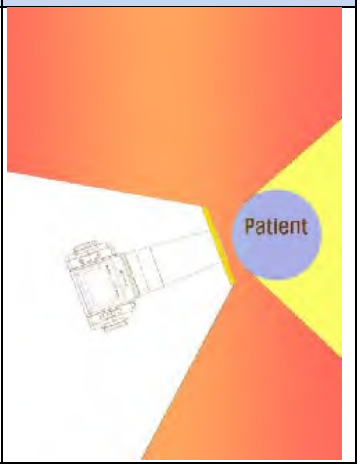
- This x-ray device may be dangerous to operator, patient and bystander unless safe exposure factors, operating instructions and maintenance schedules are observed.
- Do not operate if the backscatter shield or collimator cone are broken!

1) Ensure proper registration and compliance with any such regulation.
2) In implementing a radiation protection program, please consult any state, provincial, and local regulations governing radiation protection and the use of x-ray equipment.
3) Operator must follow all applicable regulatory guidelines and in-house radiation protection program in regard to patients and operators who are pregnant or expect to become pregnant.
4) Operators must be fully acquainted with industry safety recommendations and established maximum permissible doses.
5) Optimal operator radiation backscatter protection exists when:
   - the backscatter shield is positioned at the outer end of the collimator cone,
   - the backscatter shield is parallel to the operator,
   - the backscatter shield is close to the patient,
   - the patient tilts their head when needed to accommodate exposures, and
   - the operator remains within the Significant Zone of Occupancy immediately behind the device shield.



6) Do not enable ***Rextar X*** until patient and operator are positioned and ready for the exposure, reducing the likelihood of interruption and preventing inadvertent exposure of anyone to x-rays.
7) Do not attempt an exposure if anyone else is positioned immediately behind the patient (in line with the direction of x-ray emission). If others are assisting, then they should wear protective covering.

8) When selecting and using Position Indicating Devices (PIDs), preference should be given to models that allow the backscatter shield to remain at the outer end of the collimator cone for maximum operator protection. For example, a Rinn-style positioner with a *shortened rod* is one solution.
9) An exposure can be terminated for any reason by abruptly releasing the depressed trigger (for more information, see Section 6.5. *X-ray Exposure*).
10) As shown in the table below, maximum protection (white area) from backscatter radiation (red area) exists when the ***Rextar X*** is positioned near the patient, is perpendicular to the operator (with the patient's head tilted if needed), and the backscatter shield is fully extended toward the patient and parallel to the operator.

Maximum Protection	**Reduced Protection**	
Proper positioning	Device held back	Non-perpendicular
		

11) Operation outside the protection zone (or with a diminished protective zone) requires proper precautions such as the use of lead aprons.
12) Do not use low class image detectors.
(**Film**: higher than E class, **Sensor**: higher than 10 lp/mm, **Phosphor plate**: higher than 10 lp/mm)

***Comparative Data for Whole Body Exposure (Total Annual Operator Exposures)**

Occupational Dose Limit[1]	50 mSv
Occupational Dose Limit Required Dosimetry[1]	5 mSv
Average Natural Background Radiation[2]	3.65 mSv
Average Occupational Radiation Exposure for Flight Crews[3]	2.19 mSv
General Public Dose Limit[1]	1.00 mSv
Range of Exposure for Dental Personnel Using Conventional X-rays[2]	0.20~0.70 mSv
Average Exposure Using ***Rextar X*** with D - Speed Film[4]	*0.25 mSv*
Average Exposure Using ***Rextar X*** with F - Speed Film or Digital Sensor[4]	*0.10 mSv*

1) Standards for Protection Against Radiation, 10 CFR 20 (US Federal Standards), 1994

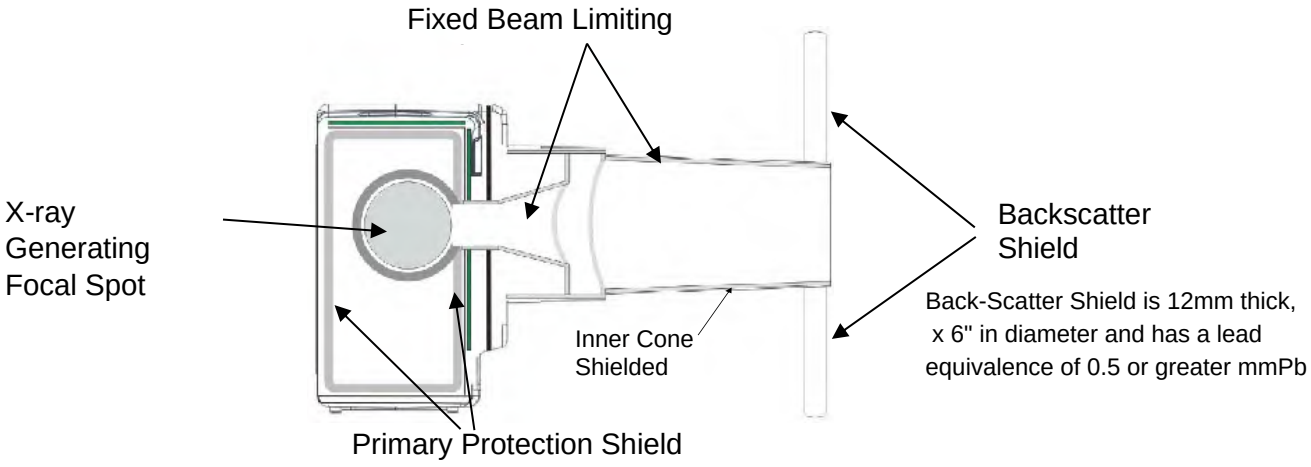
(see also NCRP Report No. 116)

2) NCRP Report No. 145 (National Council on Radiation Protection and Measurements), p7-9
3) "Estimated Cosmic Radiation Doses for Flight Personnel", Feng YJ et al, Space Medicine and Medical Engineering, 15(4) 2002, p265-9
4) Normalized average assumes 7,200 exposures per year, and the average length of exposure for **E-speed Film** = 0.20 seconds, **digital sensor** = 0.10 seconds

***Comparative Data for Hand and Extremity Exposure (Total Annual Operator Exposures)**

Occupational Dose Limit[1]	500 mSv
Occupational Dose Limit Required Dosimetry[1]	50 mSv
Average Exposure Using ***Rextar X*** with D - Speed Film [2]	*0.40 mSv*
Average Exposure Using ***Rextar X*** with F - Speed Film or Digital Sensor[2]	*0.20 mSv*

1) Standards for Protection against Radiation, 10 CFR 20 (US Federal Standards), 1994 (see also *NCRP Report No. 116*)
2) Normalized average (includes leakage and backscatter radiation) assumes 7,200 exposures per year, and the average length of exposure for **E-speed Film** = 0.20 seconds, **digital sensor** = 0.10 seconds



2.5 Usage and Duty Cycle

Rextar X is designed to avoid any damage from overheating. The maximum duty cycle rating (the relationship between duration and frequency of exposures) is 1:60. Operator can refer to chart below for optimal use.

<Example of optimal use>

Duration	0.1 sec	0.25 sec	0.46 sec	0.5 sec	0.99 sec
Cycle	Every 6 sec	Every 15 sec	Every 28 sec	Every 30 sec	Every 60 sec

- The device should be used with a tripod or a mountable arm fixture for radiation safety according to European Union (EU) requirements.
- ***Rextar X*** should not be used in environments where flammable cleaning agents are present
- Locate the battery charger away from the normal patient environment.
- ***Rextar X*** is not operated with insufficient voltage.
  The proper voltage rating for ***Rextar X*** battery is **11.1DCV**

2.6 Cleaning

1) Ensure the battery charger is unplugged before attempting to clean, and make sure the power is turned off while cleaning.
2) Cleaning can be done with a non-alcohol based disinfectant wipes. (Operators must be careful not to dampen the device with any liquid, alcohol, or spray. Controls are not waterproof.)
3) ***Rextar X*** and the accompanying battery charger are not designed to be subjected by any kind of sterilization procedure. ***Rextar X*** is not designed to be sterilized.

The system is rated for IPX 0; do not operate the system or use battery charger if either was immersed liquid or subjected to undue amount moisture.

2.7 Storage and Transportation

- Store the unit in a place which is not affected by air pressure, temperature (cool), humidity (dry), ventilation, sunlight, dust, salt, sulfur, etc. for long term storage. Please be careful not to drop or hit the device during storage or transportation.
- Device function and battery charging should be checked every 2-3 months.

1) Temperature conditions

Condition	Storage	Transportation	Use
Temperature	-20 ~ 60°C	-20 ~ 60°C	10-35°C

2) Humidity conditions

Condition	Storage	Transportation	Use
Percentage	5-90 %RH	5-90 %RH	10-85 %RH

3) Atmospheric pressure

Condition	Storage	Transportation	Use
Pressure	800-1060 hPa	500-1060 hPa	800-1060 hPa

2.8 Periodic Maintenance

Annual maintenance is recommended by a qualified technician for performance and safety, as well as assurance of accurate X-ray exposure levels.

The battery should be tested and replaced approximately every two years. See section 9 - **Battery Removal and Replacement Procedure**.

- Medical electrical equipment requires special precautions regarding EMC, and must be installed and put in to service according to the EMC information provided in the user manual.
- Portable and mobile RF communication equipment can effect medical electrical equipment.
- The use of accessories other than those specified in the user manual may result in increased emissions and void the warranty.

PART II. SERVICE MANUAL

1. Notes to the Users

1) If output adjustment after a regular inspection or repairs is needed, consult the procedures detailed as following.

※ CAUTION※
Ionization exposure is hazardous. Pay attention to below articles

2) This manual was created to promote the proper use of REXTAR-X.
Make sure to become acquainted with the manual before use of the device.
3) Improper use or operation may decrease the life of the REXTAR-X device or even cause errors in function.
See Warning in manual.
4) REXTAR-X must be operated by an expert with thorough knowledge about the device.
5) Use only the power cables, software, and miscellaneous accessories developed and distributed by POSDION Co., Ltd.
6) POSDION Co., Ltd. will not accept liability for third-party or patient claims.
7) Store this manual near the REXTAR-X device, in an easy-to-find place

2. Regular Maintenance

1) Introduction

The **REXTAR-X** X-ray unit is designed for a service life of 7 years. The performance of the batteries however may decline during the lifetime, depending on the number and time of the charging cycles. The batteries are replacement parts and if necessary they can be replaced by qualified service personnel.
The device must be inspected regularly according to the following inspection schedule.

2) Inspection Schedule

a. 6-month Regular Inspection

◈ Check to see that all displays (state display light, clock, etc.) are functioning normally.

◈ Check to see that all functions (all switches etc.) are normal.

◈ Confirm the adjustment state (4. of the Service Manual, error codes) of the device.

◈ Carry out any additional tests as determined by law.

b. Annual Inspection

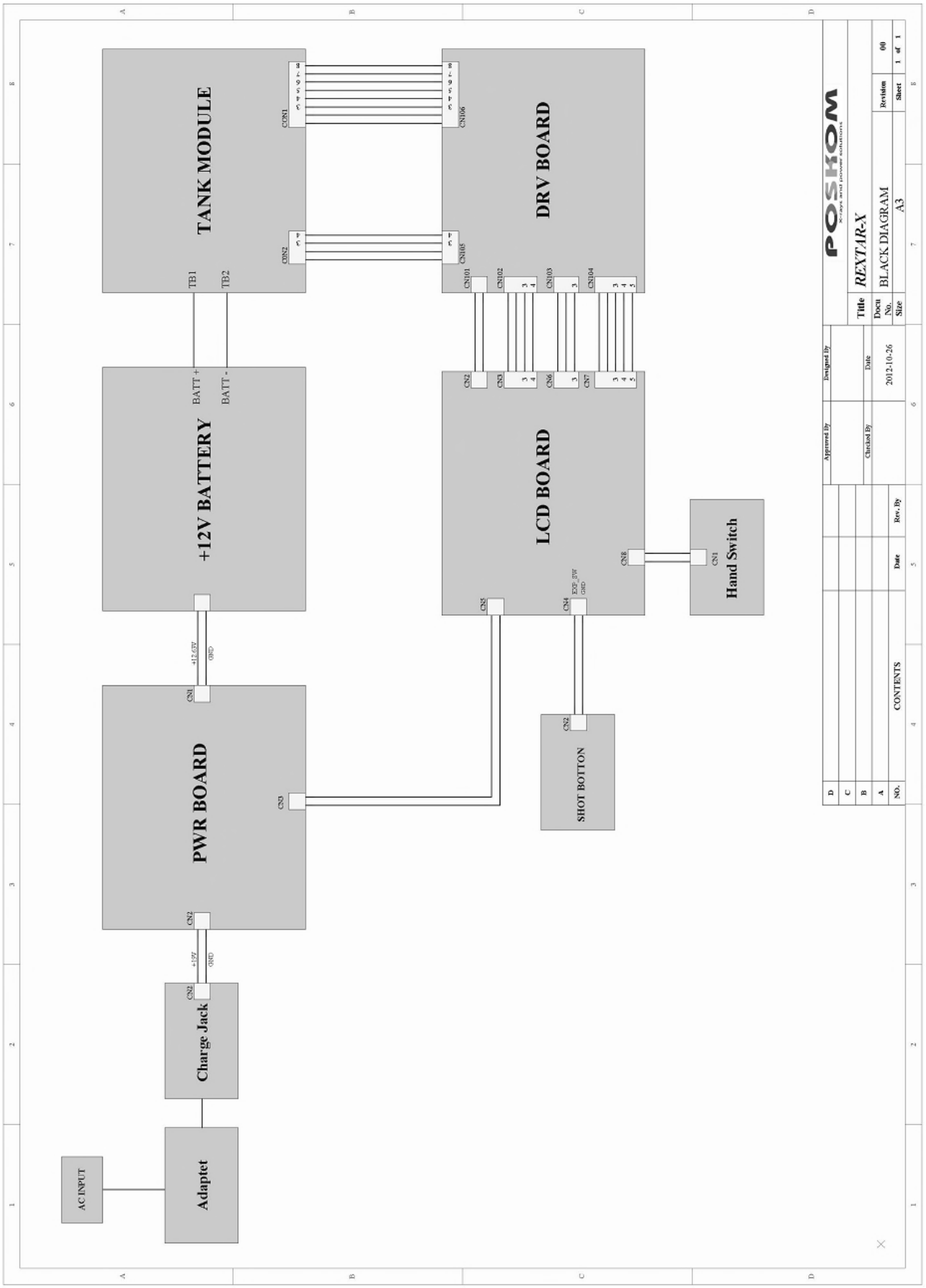
◈ Inspect the exterior for visible signs of damage.
◈ Check the connection state of all externally-connected electrical cables.
(sensor connective cables, power cables, etc.)

◈ Open the cover of the device and check for any visible disorders.
(grounding wires come loose or even slipped off entirely, leaking, damaged wires, etc.)

※WARNING※
Always keep in mind that this device contains potentially harmful elements, and must be handled by a skilled technician.

※WARNING※
As a safety precaution always remove the batteries before conducting the inspection

3. Block diagram



4. ERROR CODE

1) Error Code

Err Code	Details
Error 1	Hardware Error (Voltage, current error)
Error 3	Exposure Timer Error (When exposure is over than exposure setting time)
Error 21	Thermal Error (When inside temperature of TANK is over than setting temp.)
Error 9	Exposure Cancel (When X-ray exposure button is released before exposure setting time)

2) Managing Errors

If an error occurs, release the exposure button, and Power Off.

Re-start from Power on and Keep pushing X-ray exposure button until Exposure setting time for enough exposure.

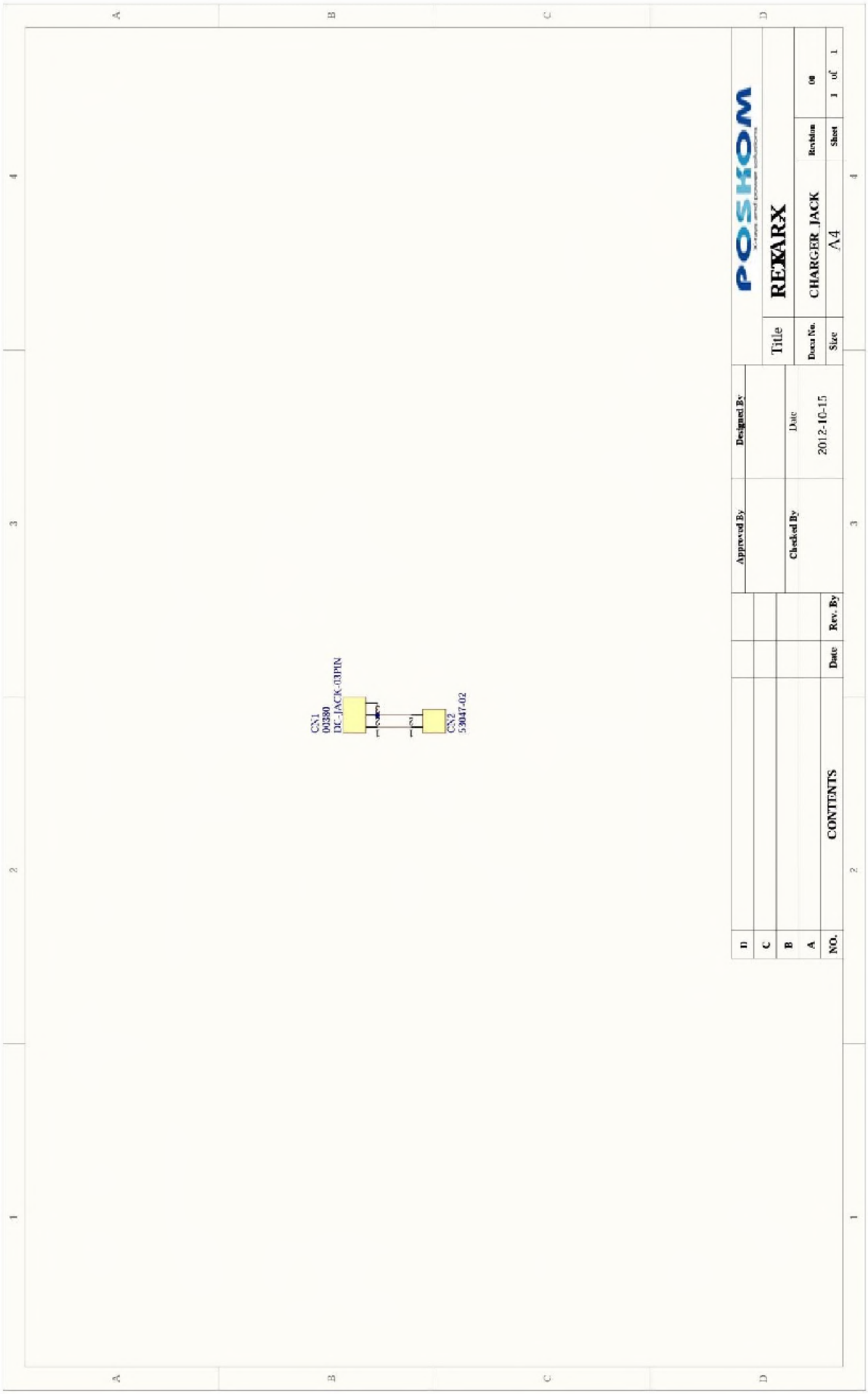
If the same error occurs, enquire with the POSDION Co., Ltd. Service Team, or to a retail center licensed for service

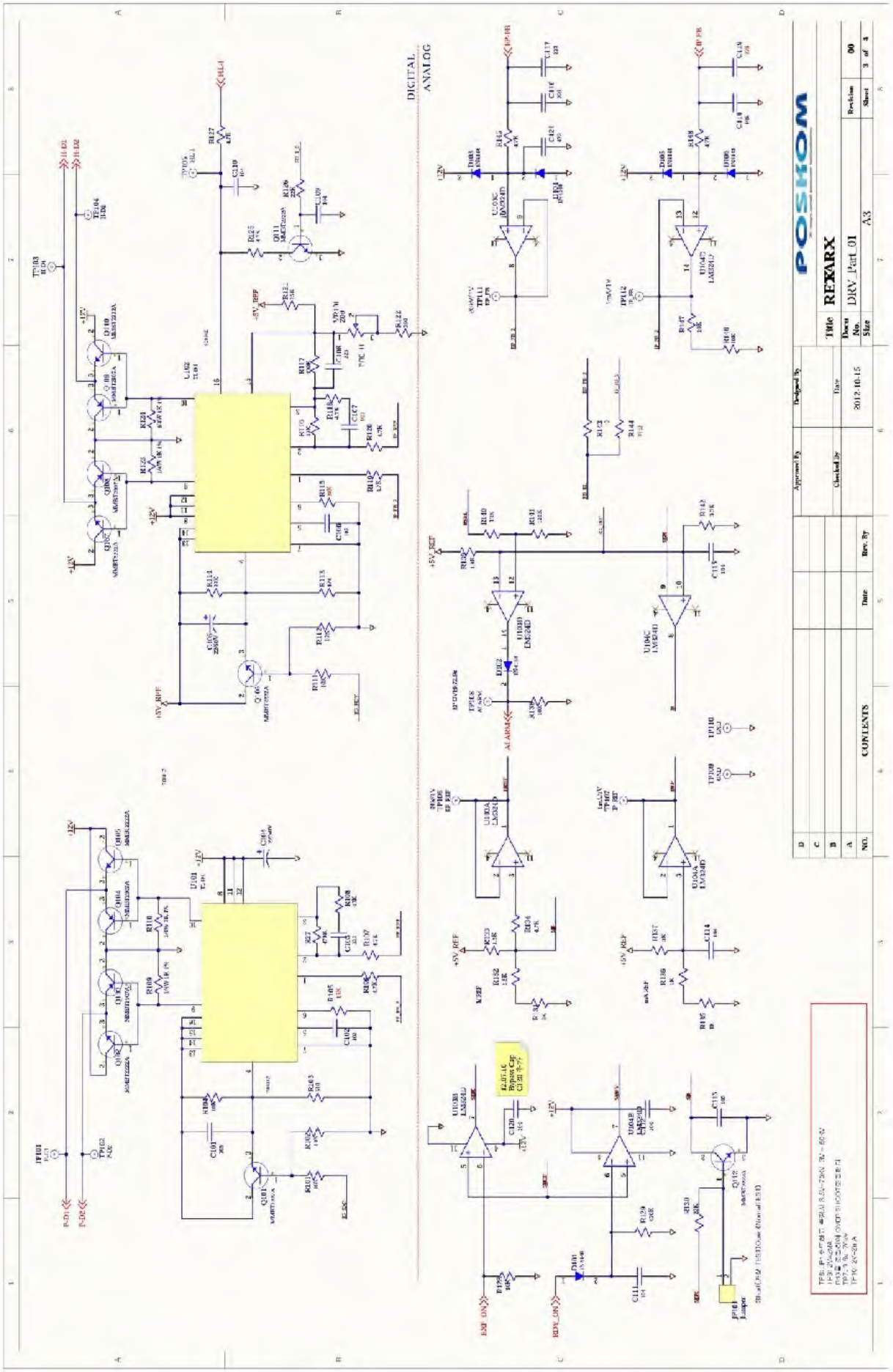
※ CAUTION※

If error messages occur repeatedly, stop excessive use the device, but enquire with the POSDION Co., Ltd. Service Team, or to a retail center licensed for service

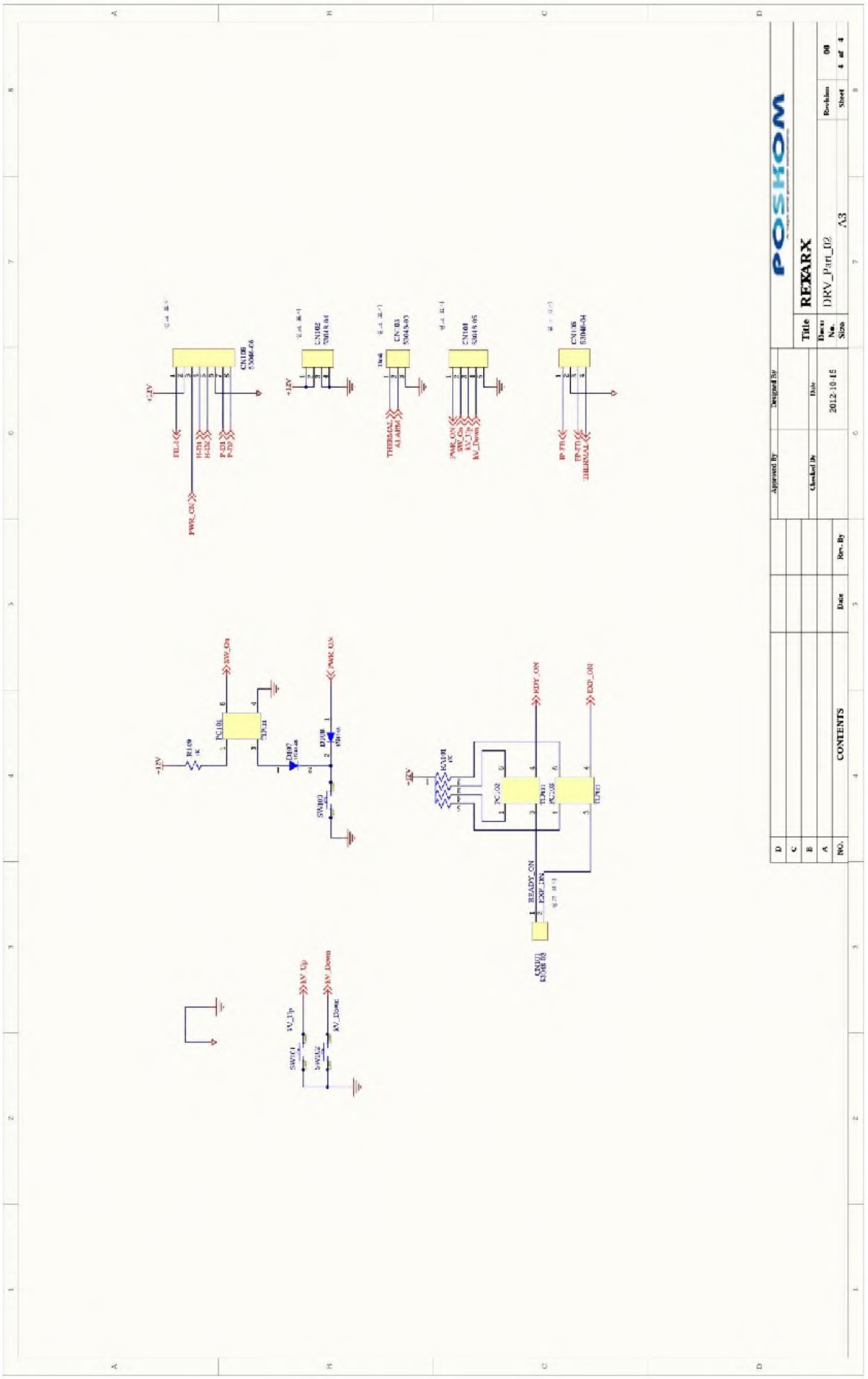
5. Circuit Diagrams

For Authorized Service and Test Technicians

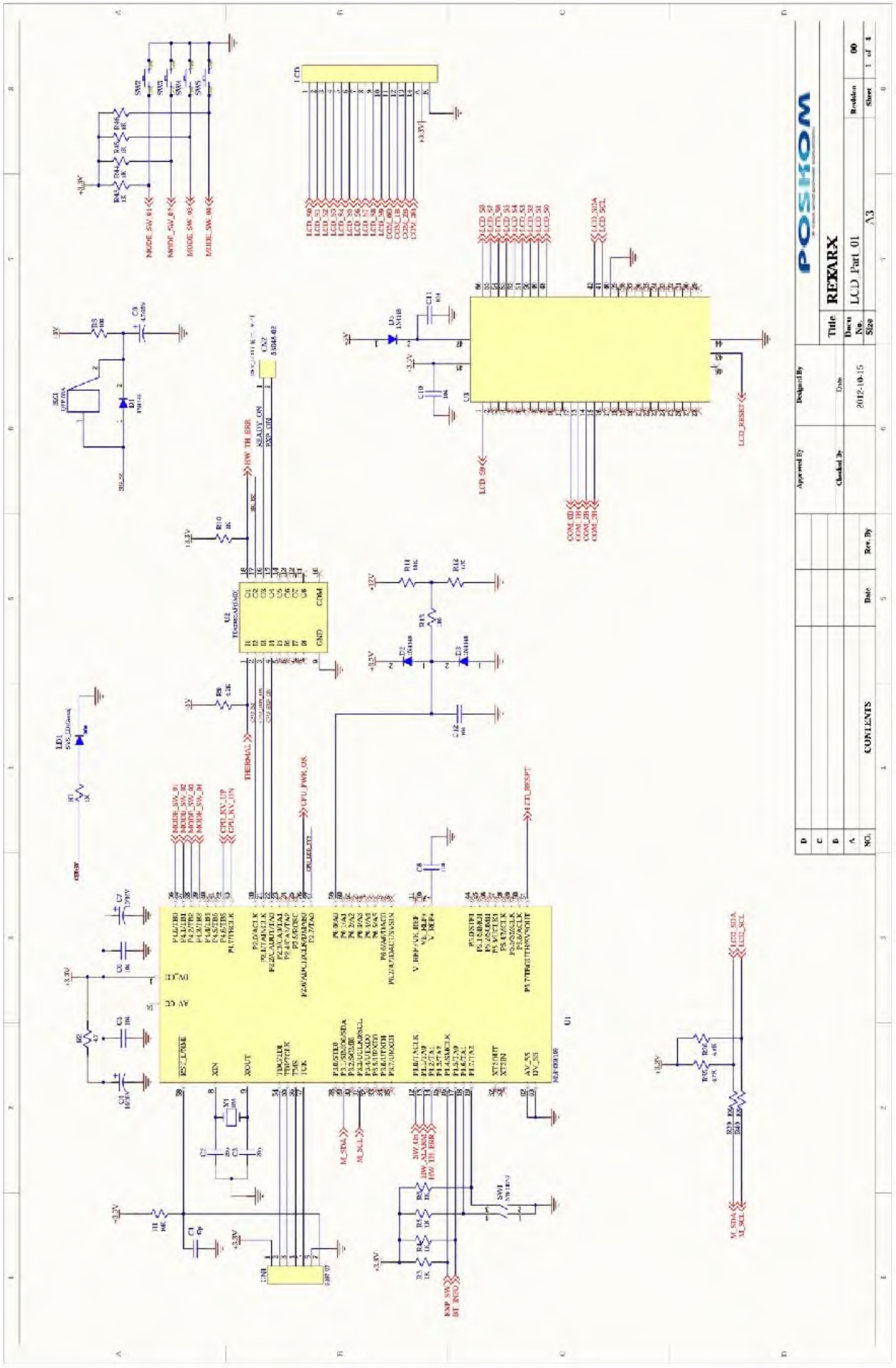


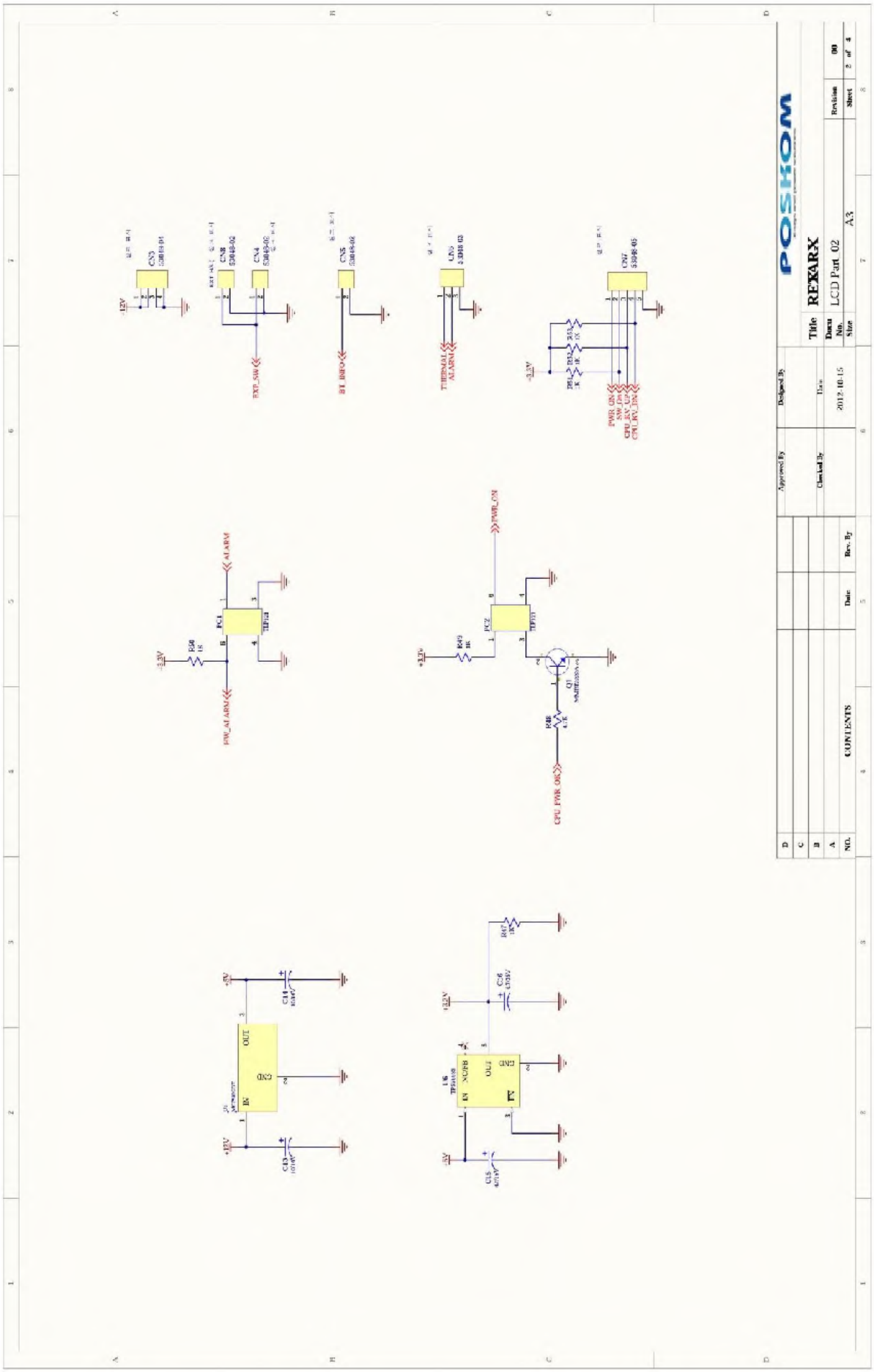

DIGITAL
ANALOG
POSKOM
REXARX
DRV_Part_01
A3
2012-10-15
CONTENTS

For Authorized Service and Test Technicians



For Authorized Service and Test Technicians

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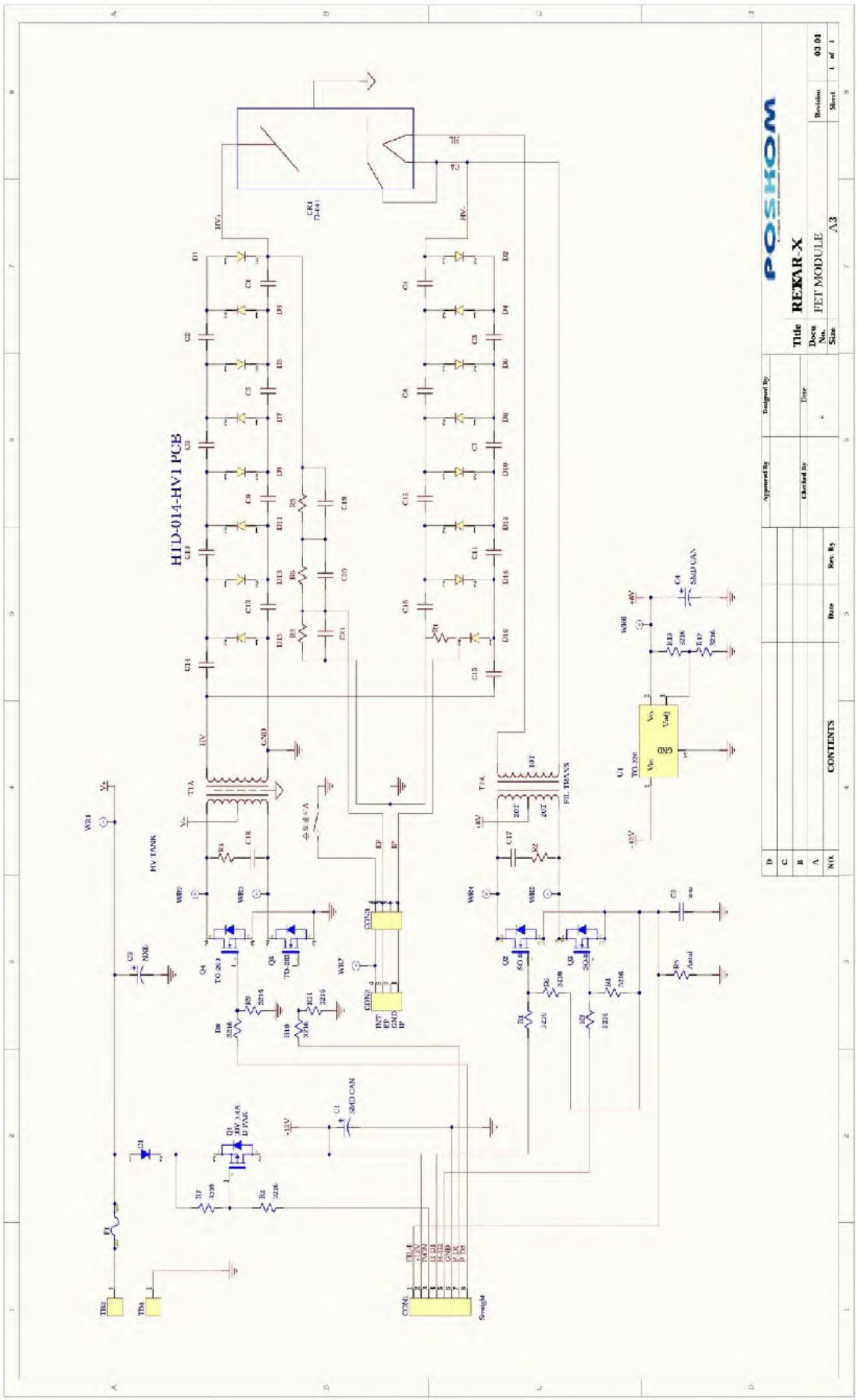
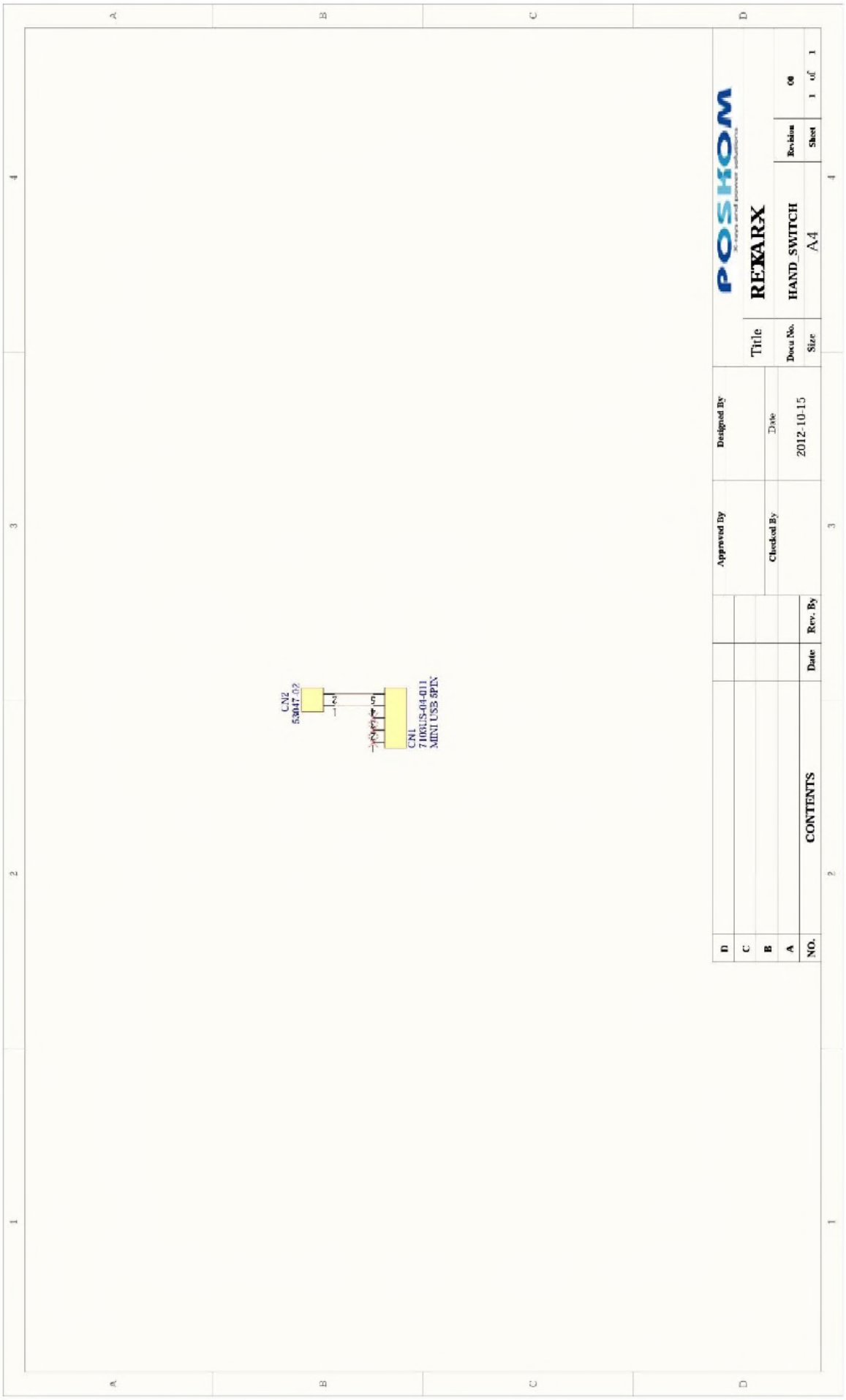
Title REXARX
Docu No LCD Part 02
Size A3
Revision 00
Sheet 2 of 4
Approved By
Checked By
Designed By
Date 2012-10-15
CONTENTS
CN3
CN4
CN5
CN6
CN7
THERMAL ALARM
PWR_ON
CPU_PWR_ON
FW_ALARM
Q7
U6

For Authorized Service and Test Technicians

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CN1
7106US-04-011
MINI USB 5PIN
POSKOM
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Title
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Revision
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Approved By
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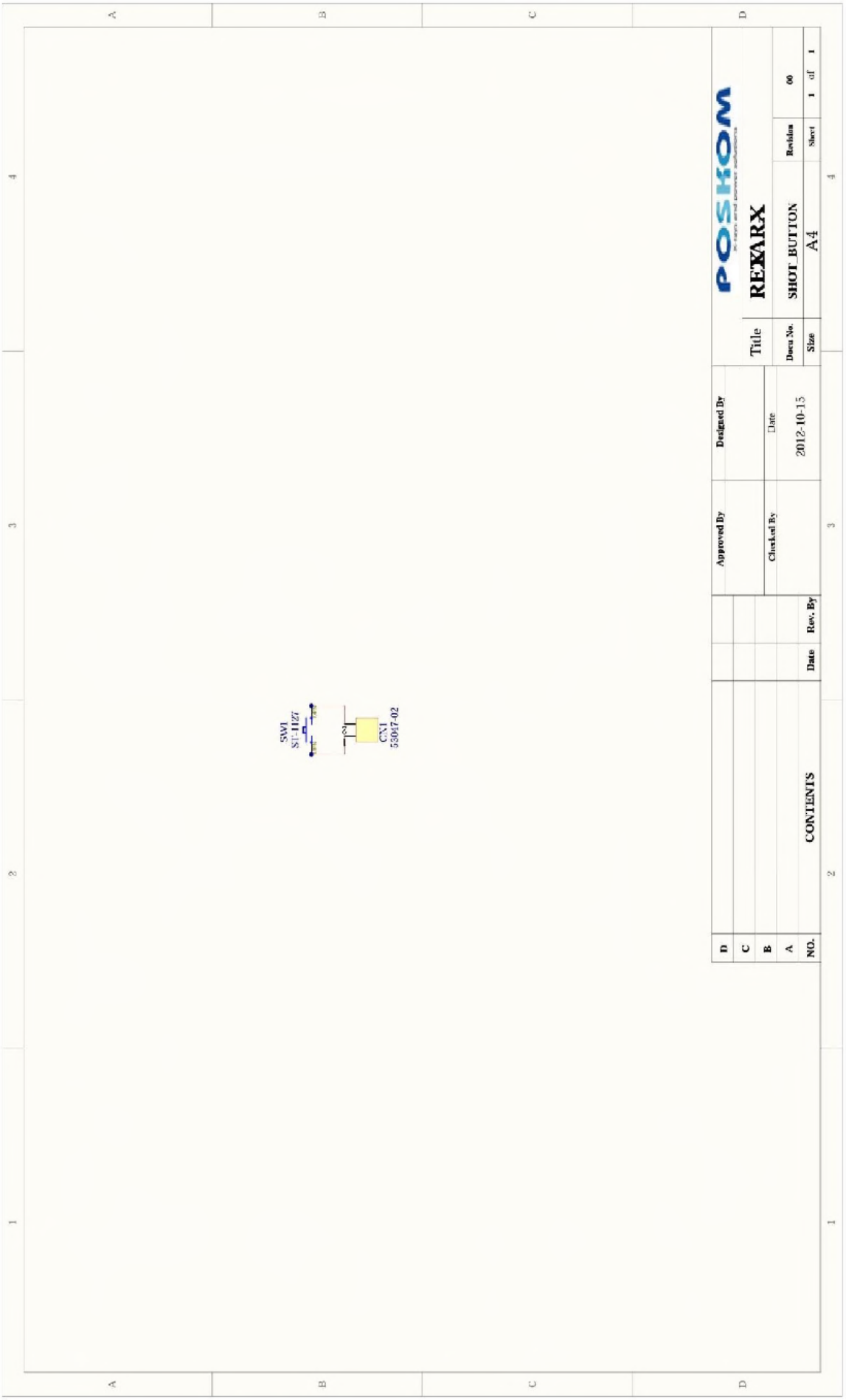
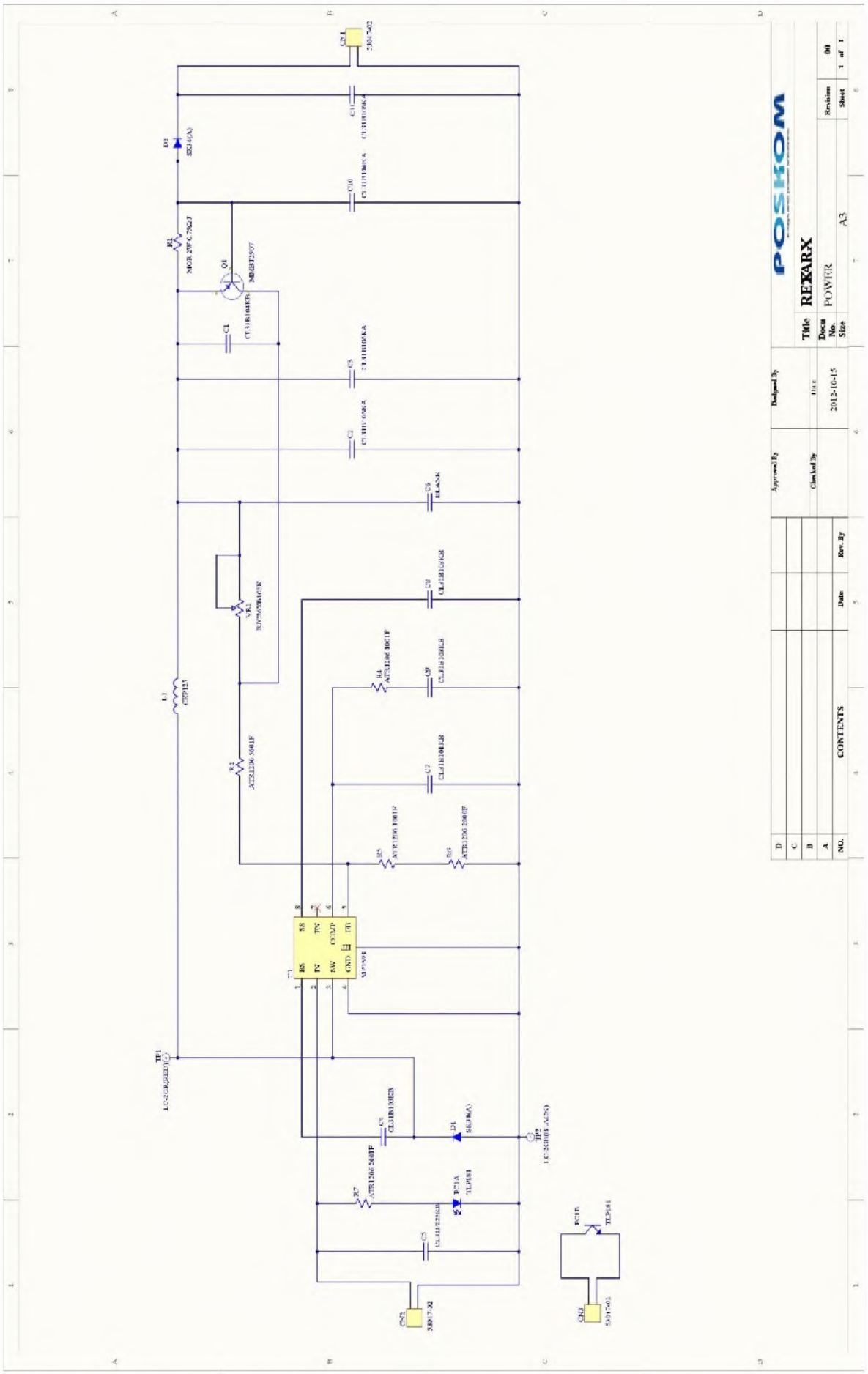
CONTENTS
Date
Rev. By

For Authorized Service and Test Technicians



For Authorized Service and Test Technicians



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Part III. Calibration Manual

1. Basic Instruction

1) Outline

When there is a change in X-ray output in initial use or during use, you can control output value with Calibration.

> ※**WARNING**※
> **Always keep in mind that calibration must be handled by a Skilled technician**

2) Control Range

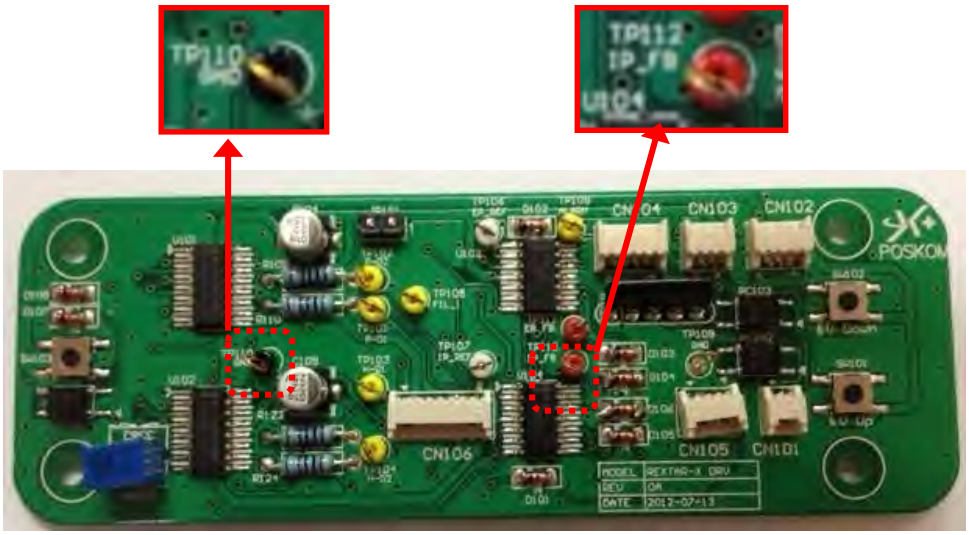
REXTAR-X has **fixed output with 70kV / 2mA**.

kV and mA are not controllable. Only Filament preheat is controllable.

Is it only when mA output is changed within ±10% suddenly to control Filament preheat.

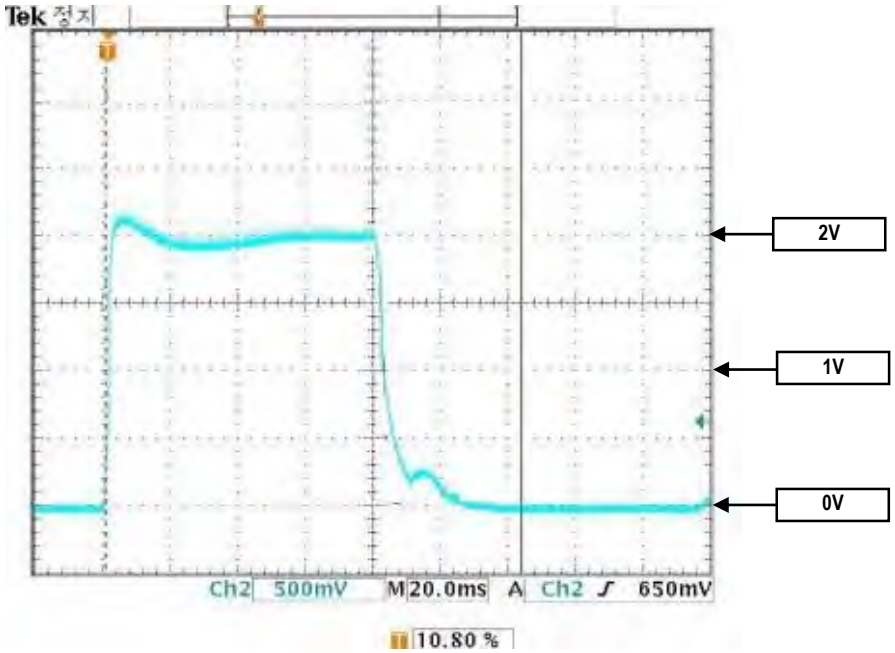
3) How to calibrate

- Measuring instrument : Digital Oscilloscope
- Measuring Point : IP(mA) Feedback points of REXTAR-X DRV Board
  - DRV Board - TP110(Black) : GND
  - DRV Board - TP112(Red) : IP(mA) Feedback



< Pic3.1.3.1 REXTAR-X LCD DRV Board Measuring Point >

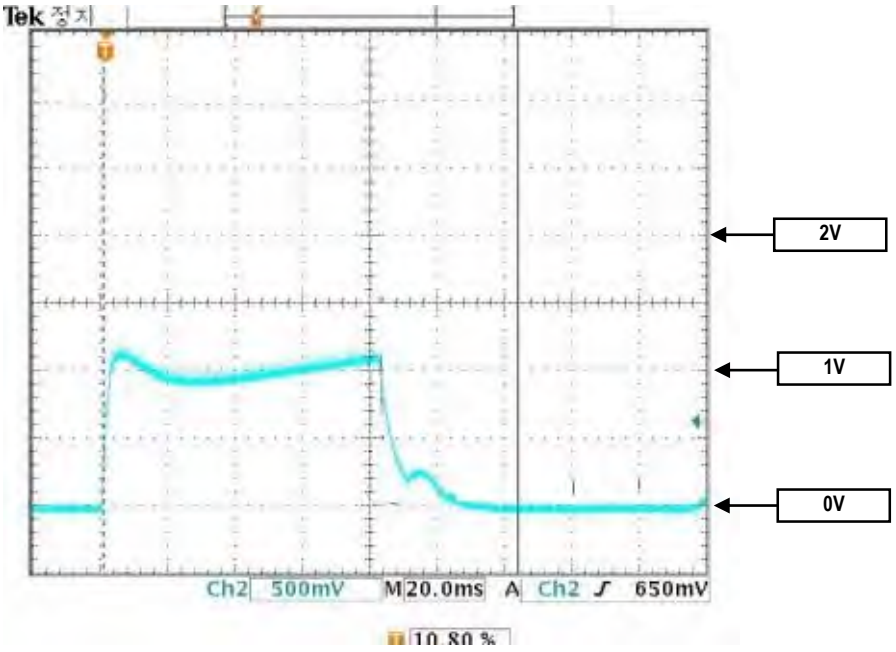
- How to check Digital Oscilloscope : mA is fixed so 2mA will come out.
- mA Feedback is calculated 1mA as 1V output. Therefore, 2V should come out in mA.



< Pic3.1.3.2 Normal mA output waveform >

- mA waveform when Filament is abnormal : when there is a problem in Filament, and mA is low , Filament preheat control is needed.

(If mA output is high, it means device problem, so inquire A/S)



< Pic3.1.3.3 mA output waveform when Filament is abnormal >

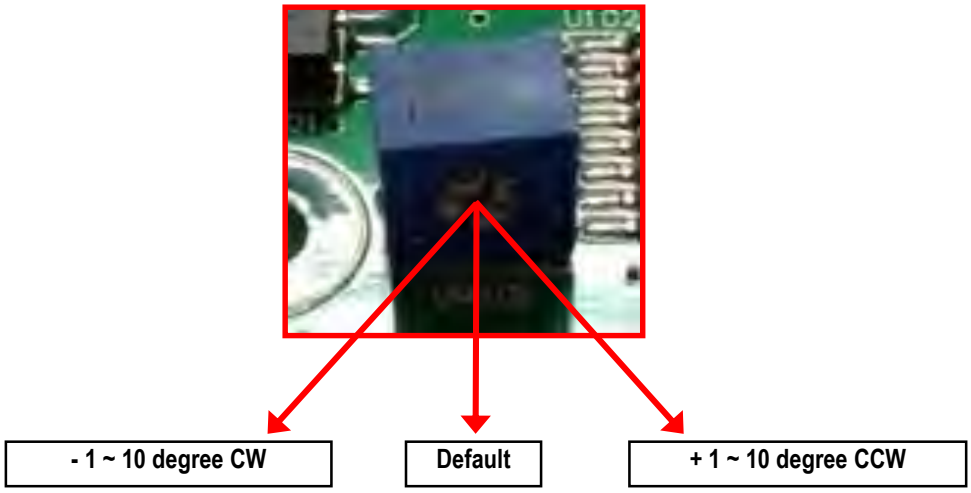
- How to calibrate mA when Filament is abnormal : Control Filament Preheat value with VR1

*DRV Baord - VR101 : Volume Resistor 200Ω

< Pic3.1.3.4 Filament calibration Volume Resistor location>

- How to calibrate with VR101

*You can check VR output by moving slowly with 1~10 degree in CW, CCW.



< Pic3.1.3.5 Filament calibration Volume Resistor control >

① In case of CCW, Filament preheat value is high and mA will increase.

② In case of CW, Filament preheat value is low and mA will decrease.

③ You need to control optimal mA output by calibrating Filament preheat.

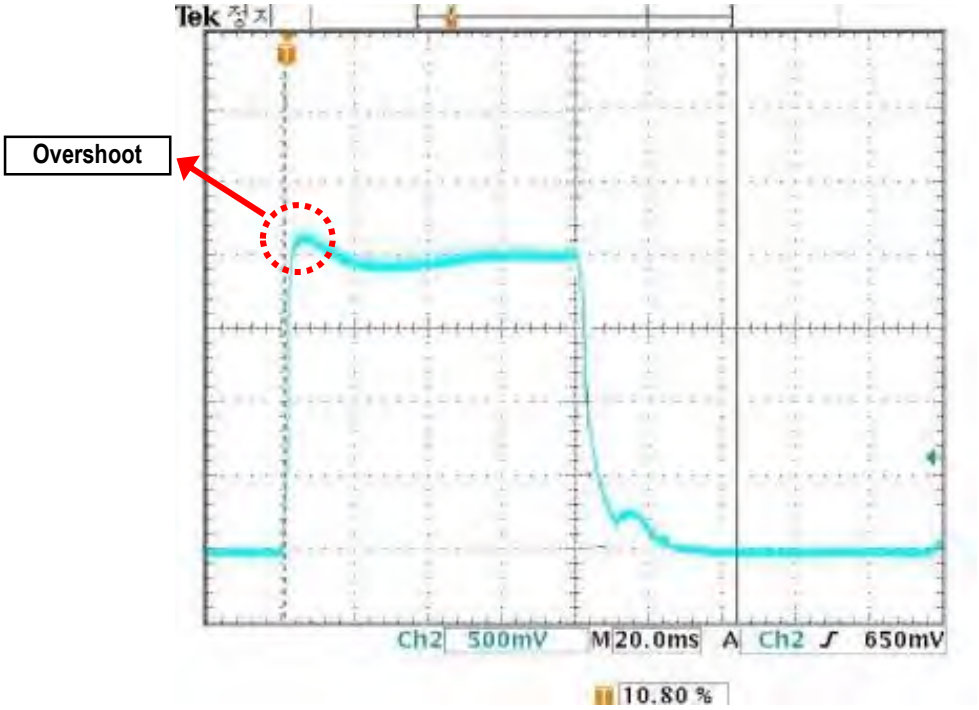
④ After calibration, check mA output is normal referring to **3) How to calibrate**.

- Notice for Calibration

 Below table is normal mA output waveform after control completion.

 As Filament preheat value is high, Overshoot also increases. Therefore, when you control it, you should Check Overshoot value and proceed Final control.

Overshoot scope should be within **+30% of rating output.**



SERVICE REQUIREMENTS

This form must be completed fully and submitted with any POSDION generator returned for warranty considerations or repair requests.

A. GENERAL INFORMATION

1) Product Name : _____
2) Serial Number : _____
3) Date Received : _____
4) Date Installed : _____
5) Date Defective found : _____
6) What Stage was rejected :

□ At the initial inspection upon receipt or □ after storage
□ In course of installation or □ In actual service in the field

B. DETAIL INFORMATION

1) Symptoms in detail _____

Highest condition used at _____ kV _____ sec

Most frequently used at _____ kV _____ sec

2) Describe any problems experienced

_____

Setting at time of failure _____ kV _____ sec

Describe any unusual occurrence _____

Abnormal symptoms prior to failure _____

Abnormal symptoms at time of failure _____

3) Further details or attachment would be highly appreciated.

Full Name _____ Company/Hospital _____

Telephone _____ Fax _____

Signature _____ Date _____

_____

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RextarX Operator Safety and Training Course Test

Name: _____

Date: _____

Results: Passed Failed

1) _____ **A Parent must wear a lead apron if they stay in the room when X-rays are taken of their child.**

   a. True

   b. False

2) _____ **How is the unit locked and secured when not in use?**

   a. Sitting on the counter in the exam room

   b. Placed in a storage cabinet away from exam rooms

   c. Locked in **a cabinet** and place the keys in another location

3) _____ **When do you remove the backscatter shield?**

   a. Anytime it gets in the way

   b. Never. It must stay affixed to the end of the cone for operator safety

4) _____ **What position should the backscatter shield be to the operator?**

   a. Perpendicular

   b. Angled

   c. Parallel

5) _____ **What is the meaning of ALARA?**

   a. As Low As Reasonably Achievable

   b. As Little As Randomly Achievable

   c. As Long As

6) _____ **What type of disinfectant should you use to clean the device?**

a. Non-acetone and non-alcohol disinfectant wipes

b. Xylene

c. Rubbing alcohol

7) _____ **The correct way to hold the device is with one hand on the cone.**

a. True

b. False

8) _____ **How would you change the radiology settings from adult to child?**

a. Press and hold the **#8 lower left side** button

b. Press the up arrow button, the down arrow button, then press OK

c. Press the up arrow button, then press **the exposure button.**

9) _____ **How would you change the exposure time?**

a. Press the Up or Down arrow keys

b. Choose another tooth type

c. All of the above

10) _____ **What is displayed immediately after a full exposure?**

a. 

b. "READY"

c. "**Next**"

11) _____ **How do you change the tooth type setting?**

a. Press the up "^" button 3 times, then down "v", then OK

b. Press the down "v" button 3 times, then up "^", then OK

c. Press the #8, or #9 buttons

12) _____ **How do you resolve error codes?**

a. Ask another technician for advice

b. Refer to the Error List in the User Manual

13) _____ **Required exposure times typically differ from film to sensor.**

a. True

b. False

14) _____ **The Posdion Rextar-X should be inspected at least once per year by a qualified technician.**

a. **True**

b. **False**

.

15) _____ **What is the source to skin distance in accordance with FDA regulations?**

a. A limit SSD to not less than 18 centimeters

b. A limit SSD to not less than 20 centimeters

16) _____ **The pistol grip is an accessory that is approved in my state for use.**

a. True

b. False

17) _____ **This device is FDA approved and therefore we can ignore our state requirements.**

a. True

b. False

18) _____ **Does your state department have any restrictions for a handheld x-ray device?**

a. Yes

b. No

19) _____ **How do you register the RextarX with the state department?**

a. Call the state department and let them know you have the **RextarX**.

b. Send a letter to the state health department on our letterhead and state that you have the **RextarX**.

c. Fill out an application from your state health department and send it in to them.

d. My state does not have X-ray unit registration

20) **If your state department has restrictions for RextarX, please list the restrictions.**

_____

_____

_____

NOTE: Answers to Questions 16-20 will varies from state to state. The purchaser should go over their specific state requirements with their staff/employees.

13 Operator Training Test Answers

1. A
2. C
3. B
4. C
5. A
6. A
7. B
8. A
9. C
10. A
11. C
12. B
13. A
14. A
15. A

16. A or B – depends on each state's regulation

17. B.

18. A or B – depends on each state's regulation

19. C **or D** – depends on each state's regulation

20. List the information.

Rextar X Operator Training Course

This Acknowledges that:

Recipient's Name

HAS SUCCESSFULLY COMPLETED THE

Rextar X User Safety Course

SIGNED

Date

Your Business name or logo here