

It is recommended that only persons who have sufficient knowledge and experience such as system designers and responsible persons deal with this product after carefully reading the product manual.

1 The matters of safety

WARNING

- * Do not fabricate or do maintenance by yourself. Malfunction, Electric shock, and fire danger are considered. Contact us directly if you need the item to be repaired.
- * Do not let the water touch the product. It may cause electric shock or fire due to malfunction.
- * When you check or maintain the product, make it sure you turn off the power. It may cause electric shock or fire due to malfunction.
- * The item should be fixed to the target tightly. Electric discharging or breakage might happen.
- * Please shield your installing circumstances first since the item releases the soft X-ray. Direct X-ray exposure is not recommended owing to cause health problem.
- * It includes a beryllium window on the X-ray tube unit in order to release soft X-ray for ionization. This beryllium material can cause respiratory disorder only if the person gets exposed to forms of either beryllium powder or smoke. However, our device doesn't creat beryllium in neither of the mentioned forms. Please be careful not to break the device since there might be a slight chance that the device could partially degrade into the powder form, then it can cause harm defects. If the user touches the beryllium material on the device, clean oneself on the running water or rinse it off with soap directly.
- * If the beryllium window gets dirty or damaged, call us directly for assistance.
- * Do not use the product at the place where dangerous material such as inflammable or ignitable material exists. This product is not the product of anti-explosive type.
- * This device is made only for industrial uses. You need to ground the device beforehand. Otherwise, there are in case of malfunction, electric shock, or fire damage.

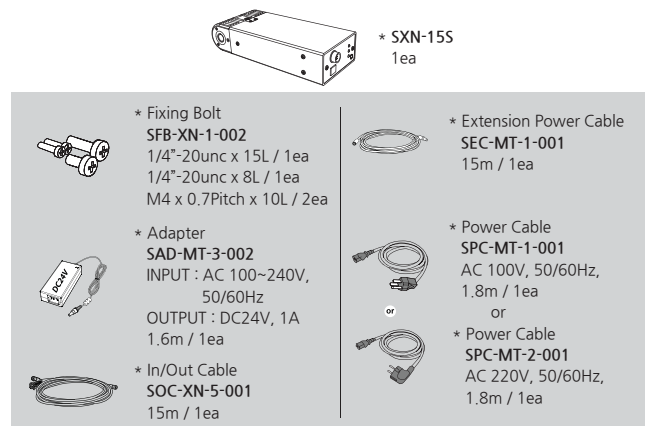
CAUTION

- * Do not disconnect the head cable with power applied. There is a possibility of electric shock or malfunction.
- * Connect wires referring to the product manual. Wrong connection can cause failures.
- * For your proper cable connection, take a look at the manual 'Installation & Connection' for references. Any disordered connection is detected, the malfunction might arise.
- * All cables should be connected all the time. Please careful of cable disconnections. If power or communication cables got damaged, replace them immediately. Malfunction and fire danger may happen.
- * Do not install the device where the vibration can be detected. Any minor impact or vibration on the device, the malfunction or danger of accident might happen.
- * Do not use the item off the range of usage(Electrostatic elimination). Malfunction or danger of accident may occur.
- * If you wish to discard the head unit of X-ray device, you need to report for disuse declaration to the institution(s) where they ask to. A proper declaration procedure is necessary in order to disuse X-ray device.
- * Please contact to either Korea Institute of Nuclear Safety(KINS) or a safety supervisor of Sunje directly.

2 Check the package contents

Product compositions

The package includes the following products composition.



Option

If you require extra functions with the basic accessories we provided, you need to purchase optional items in below for further assistant.

<Replacement parts>



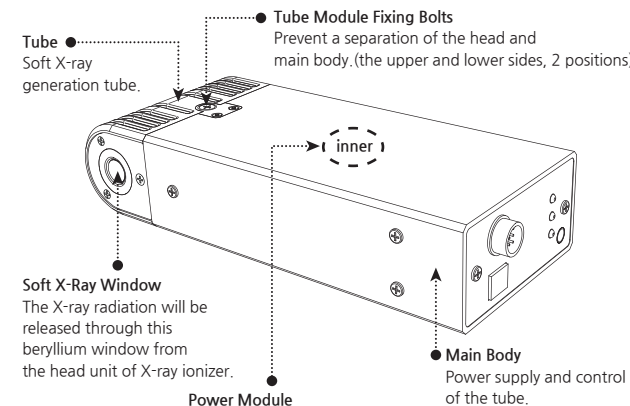
<Signal Converter Gender>



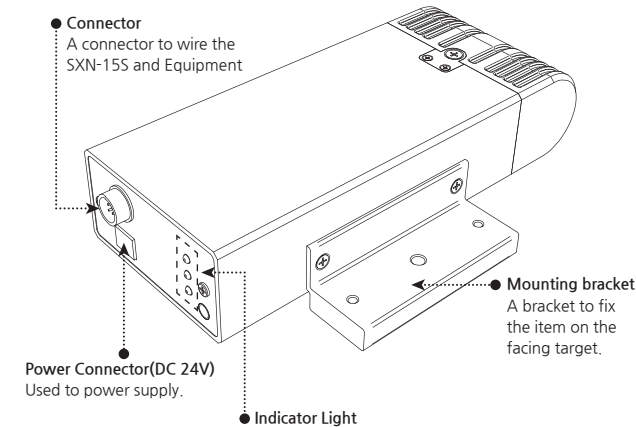
3 Nomenclatures of parts

SXN-15S

TOP / FRONT / SIDE

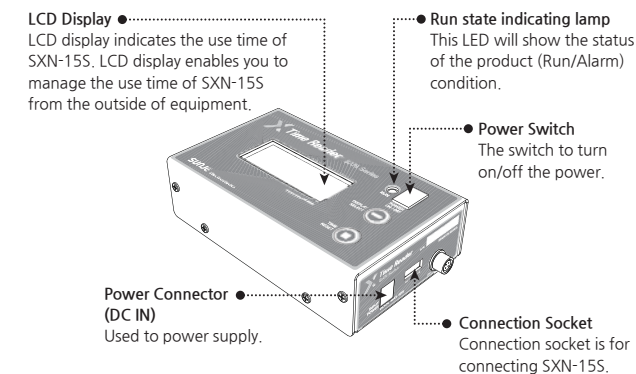


REAR



RUN (Operating indicator)	Blue LED will be on when the item is in operatind condition.
TIMER (Tube replacement alarm indicator)	Orange LED will be turned on when the lifetime of X-ray tube is exceeded.
ALARM (Malfunction Indicator)	when false operation, Red LED will be on.

SXN-S Time Reader(Optional)



4 Installation and Connection

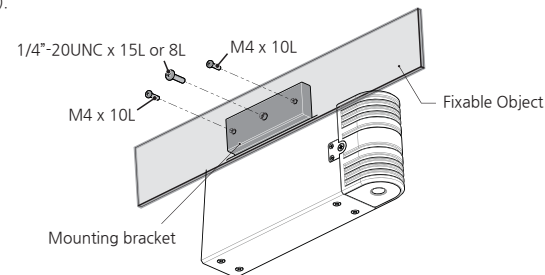
Check the installation conditions head unit

Please check the installation condition whether it meets proper specification.

- Shielded room
- There must be no objects between the target area and X-ray device.
- No vibration on the fixed device.
- Be aware of any flammable or ignitable materials around the working area.
- Secure to have enough working space for quick maintenance of the device.

Head unit fixing

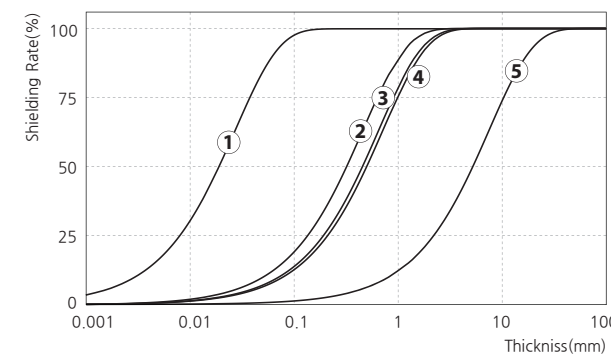
Fix the target product on the fixed area where you install by using supported fixing bolt(s).



Shielding methods

Shielding Material Selection

See the following graph for references. Select the ideal tickness and quality of shielding material.



No.	Shield Material	Thickness [mm]
①	SUS	Over 0.4
②	Aluminium	Over 7.0
③	Glass	Over 10.0
④	PVC	Over 11.0
⑤	Acrylic	Over 120.0

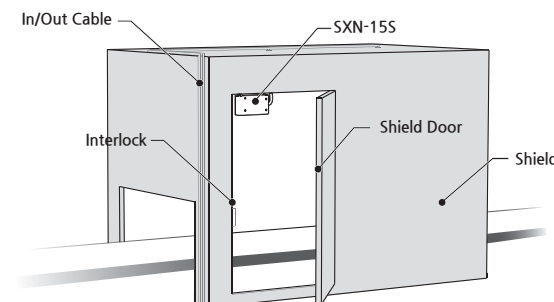
WARNING

- * Please shield the area where the customer is willing to install the soft X-ray device for safety issue.
- * After shielding process, please connection to your own interlock system to operate the X-ray device On/Off when the door is opened/closed.

Shield installation compositions

Please refer to the "Installation Compositions" for your references.

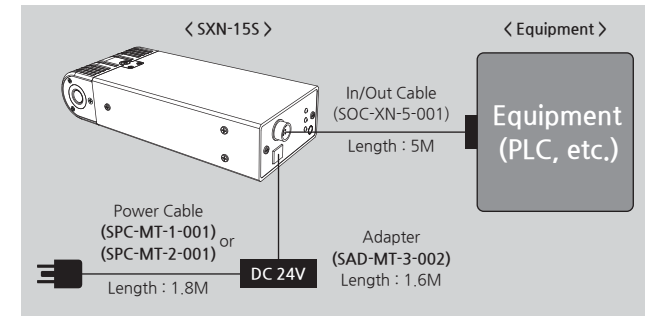
Please keep your working environment of the leakage radiation level within the range of 10μSv/hr all the time.



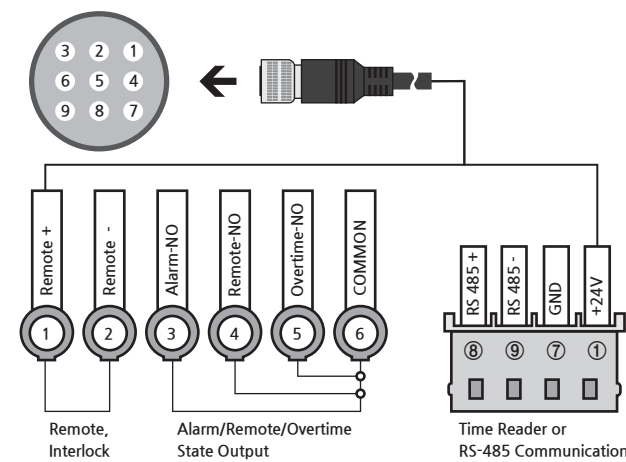
How to connect

Connecting the In/Out and Power Cable

Connect In/Out Cable supplied with Power Cable with SXN-15S. Connect another side of In/Out Cable with equipment.



In/Out Cable No.



In/Out Cable Specifications

Signal	No.	Color	Pin Name	Function
Input	1	Yellow	Remote +	The terminal is for On/Off function of the product. (Close: Ionizer On, Open: Ionizer Off)
	2	Black on Yellow	Remote -	
Output	3	Orange	Alarm-NO	When alarm occurs, it opens with common terminal.
	4	Pink	Remote-NO	When remote function works, it is closed.
	5	Black on Orange	Overtime-NO	Replacement cycle alarming function helps it to be closed with common terminal after 4,500 hours use.
	6	Gray	Common	It is common terminal for Alarm, Overtime, Remote State.
Time Reader / RS485	1	Black on Gray	+24V	An Input power terminal of Time Reader.
	7	Black on Pink	GND	-
	9	White	RS 485-	RS485(-) communication terminal.
	8	Black on White	RS 485+	RS485(+) communication terminal.

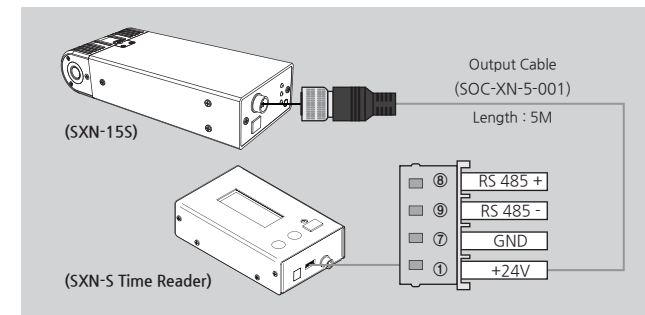
CAUTION

- * As SXN-15S requires DC 24V, do not connect with any product using DC 12V. There could be danger of malfunction, electric shock, and fire. (Be cautious when connecting Remote/Interlock)

SXN-S Time Reader (Option)

Connecting to the SXN-S Time Reader

It enables you to check the hours of use outside the equipment connecting Time Reader sold separately. Use In/Out Cable to connect SXN-15S with Time Reader.



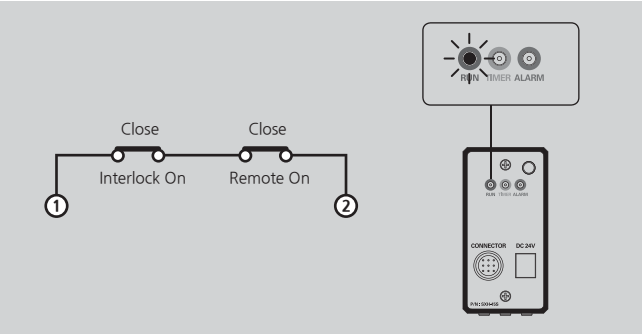
5 How to set

▶ Set the Remote / Interlock

Remote / Interlock On

When the contact of In/Out Cable No.1 and No.2 is closed, it changes to Remote / Interlock On. When LED is on, it shows that the door is securely locked and ready to operate.

Blue LED(RUN) on the back of product is turned on under Remote / Interlock On.



Remote / Interlock Off

When the contact of In/Out Cable No.1 and No.2 is opened, it changes to Remote / Interlock Off. Under Remote / Interlock Off state, the gate of shielding material is open so that the product doesn't operate.

Under Interlock Off state, product doesn't work despite Remote On.

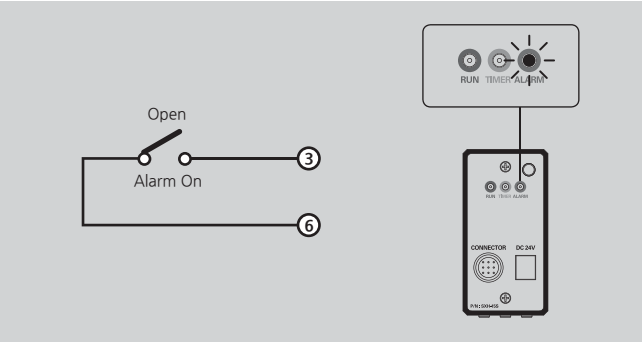
Blue LED(RUN) on the back of product is turned off under Remote / Interlock Off.

Signal	Product Operation State
	Off
	Off
	Off

▶ Alarm state output

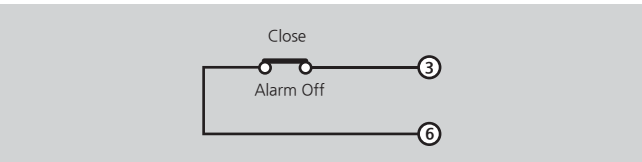
Alarm On

When the contact of In/Out Cable No.3 and No.4 is opened, it changes to alarm on. Under alarm on state, it instructs the malfunction of product as Red LED on the back of product is turned on.



Alarm Off

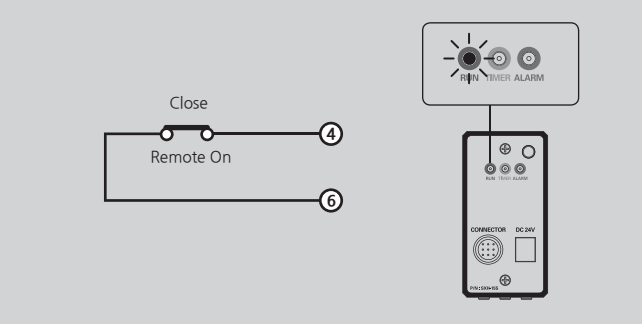
When the contact of In/Out Cable No.3 and No.4 is closed, it changes to alarm off. Alarm off state indicates normal operation of product and Red LED(ALARM) on the back of product is turned off.



▶ Remote state output

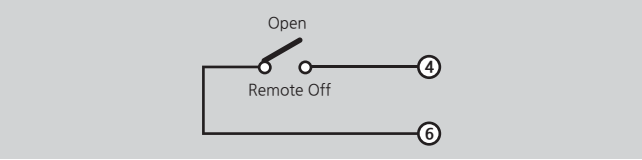
Remote On

When the contact of In/Out Cable No.4 and No.6 is closed, it changes to Remote On. Remote On state indicates normal operation of product and Blue LED(RUN) on the back of product is turned on.



Remote Off

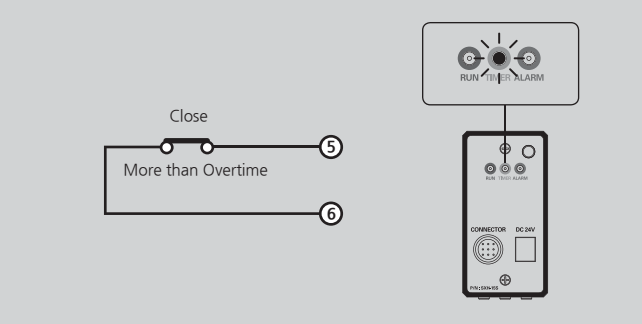
When the contact of In/Out Cable No.4 and No.6 is opened, it changes to Remote Off. Under Remote Off State, product does not work as Blue LED on the back of product is turned off.



▶ Overtime state output

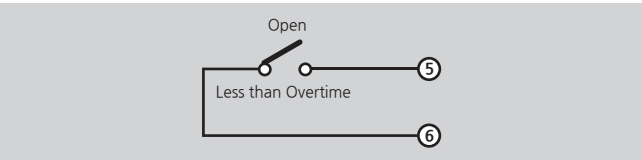
More than Overtime

When the usage time is exceeded, orange LED(TIMER) is turned on, and it means the replacement time.



Less than Overtime

When the usage time is within the limit, orange LED(TIMER) doesn't turned on, and it means does not replacement time.



▶ RS-485 Communication(Optional)

Communication	
Baud	9600
Parity Bit	None
Data Bit	8
Stop Bit	1

6 Maintenance

* This device uses the high level of voltage. When operating maintenance, please power off and unplug the device. Otherwise, there might be in case of electric shock or fire damage.

▶ Maintenance

X-ray type ionizer has own service life. The replacement is required after the service life.

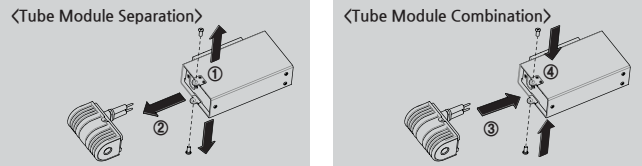
Tube Module Replacement

In case tube has problems or useful life of tube ends, purchase replacement tube and replace it as follows.

CAUTION

- * Please do not operate the product when the tube is disconnected. It may cause electric shock or fire due to malfunction.
- * When tube operates, heat is generated. Product is hot right after operation, so be careful not to touch it. There is a risk of burn.
- * Be sure not to cause accident by falling or missing a bolt when you change the tube module.
- * A H/V connector of tube module is protruded. After unscrewing, pull the unit horizontally up. Please be careful when replacing H/V connector.
- * After replacement, check if tube and head body are connected correctly. Unless they are connected properly, ground could be unstable.
- * If the fixing bolt is not mounted, it can cause abnormal operation or defective issue. Make sure that the bolt is mounted before using it.
- * Do not unscrew any bolts other than fixing bolts. If unscrewed, it can occur fire, electric shock, and breakages.

- ① **Unscrew the Tube Module Fixing Bolts**
Unscrew the tube module fixing bolts with a screwdriver. (the upper and lower sides, 2 positions)
- ② **Separating Tube Module**
After unscrewing, pull the unit horizontally up. Discard the old tube module.
- ③ **Replacing New Tube Module**
Repeat the previous steps backward to assemble.
- ④ **Screw the Tube Module Fixing Bolts**
Screw the tube module fixing bolts with a screwdriver after checking whether the new tube module is properly positioned.



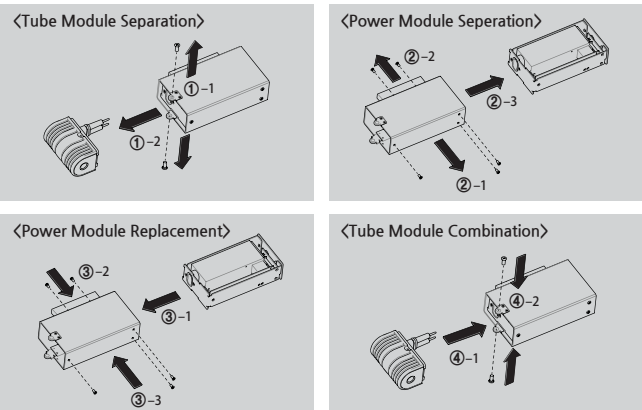
Power Module Replacement

The Red (Alarm) LED will be on the panel if there is any H/V problem. Please purchase extra H/V module and replace it as below.

CAUTION

- * To prevent any injury, disassemble the head unit where the are is safe from the equipment.

- ① **Bringing the head unit to safe are**
After disassemble the head unit, bring it to somewhere safe.
- ② **Disassemble Tube Module**
Go to <Tube Module Replacement> for more information.
- ③ **Separating Power Module**
There are 5 bolts for mounting bracket which are fixing power module: 3 bolts on front side, 2 bolts on back side. Separate power module after detaching a mounting bracket by releasing bolt with screwdriver. Dispose the power module separated personally or contact us.
- ④ **Replacing New Power Module**
Backward the steps above and place the newer one.

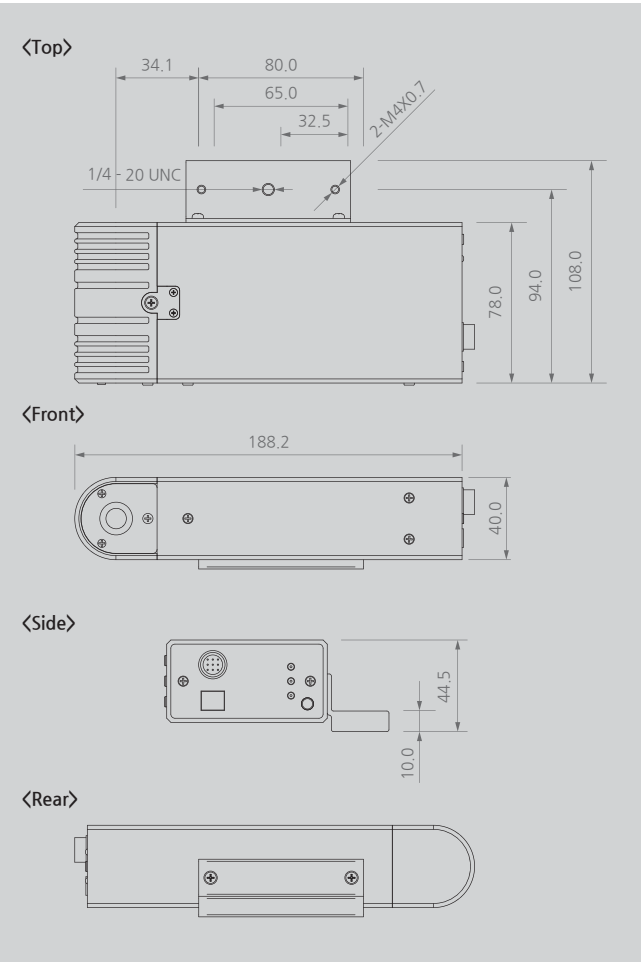


7 Problem solving

▶ Checklist before called

Problem	Identifying Problem	Solution
Not Operating	Is your power cable still plugged in?	Please re-plug the power cable and then turn the device on again.
	Was the proper voltage level applied for this set-up?	Please use the proper level of power input for the device.(DC 24V)
	Is there any alarm LED on the head unit of device?	Purchase and replace the tube unit(replaceable).
	Is remote Off?	Clear the remote Off corresponding to "Remote Setup" manual.
No Signal	Have you followed the proper procedure for Input/output signal cable(s)	Using installation and connection section, check if there is no error in connecting lines. In case there are other problems, please contact our head office
Decreased Performance	Any damages or cut on the cables?	You need to replace the cables if it gets cut or damaged.

8 Dimensions



9 Specification

Parameter	Description / Value
Ion Generation Method	Soft X-ray
Source	Soft X-ray Tube
Tube Voltage	14.9kV
Beam Angle	150°
Input Power	DC 24V
Power Consumption	Max 13W
Operation Circumstance	0℃ ~ +50℃(32℉ ~ 122℉), 35% ~ 85% RH
Weight	0.73kg
Alarm	Head Fail
Warning	Life Time Over
Remote / Interlock	Remote / Interlock On/Off Control
Indicator	Alarm State, Over Time State
Warranty	1 Year

※ The appearance and specification of the product may be changed without prior notice for the improvement of the product.

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