

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 create 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 danger.

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.

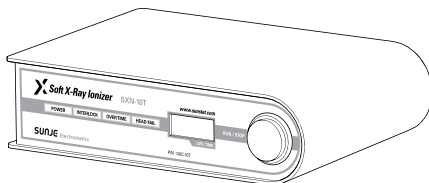
2 Check the package contents

Product Compositions

The package includes the following products composition.



Head
SXH-10V
1~4 ea



Controller
SXC-10T, SXC-102T, SXC-104T
1 ea

- Fixing Bolt
SFB-XN-1-001
1/4"-20unc x 15L / 1~4ea
1/4"-20unc x 8L / 1~4ea
M4 x 0.7Pitch x 10L / 2~8ea

- D-Sub Cable
SDC-SN-4-001
25Pin / 5m / 1ea

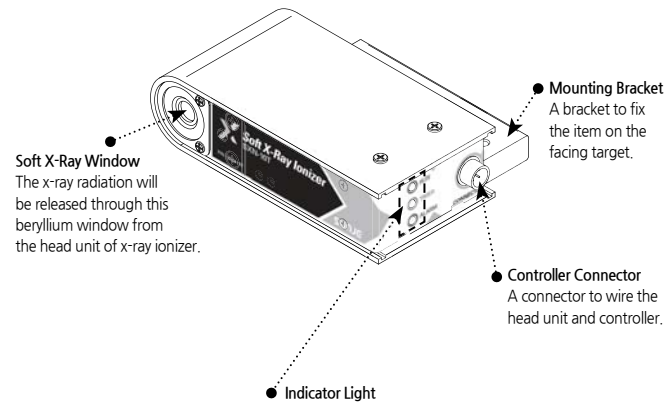
- Power Cable
SPC-MT-1-001
AC 100V, 50/60Hz, 1.8m / 1ea
or
Power Cable
SPC-MT-2-001
AC 220V, 50/60Hz, 1.8m / 1ea



Head Cable
SOC-XN-1-001
15m / 1~4ea

3 Nomenclatures of parts

Head Unit(SXH-10V)

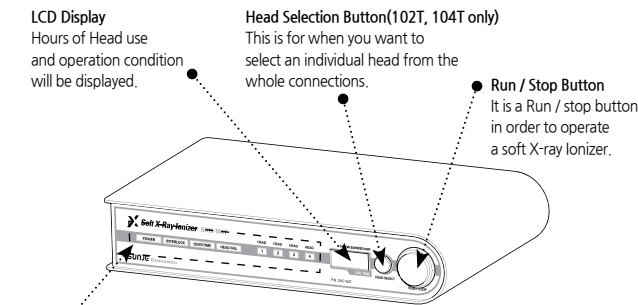


- Indicator Light**
 - RUN** Operating indicator: Blue LED will be on when the item is in operating condition.
 - TIMER** Tube replacement Alarm indicator: Once the unit reaching 7,500hrs of operation, Orange LED will be on.
 - ALARM** Malfunction Indicator: When false operation, Red LED will be on.

Controller Unit(SXC-10T / 102T/ 104T)

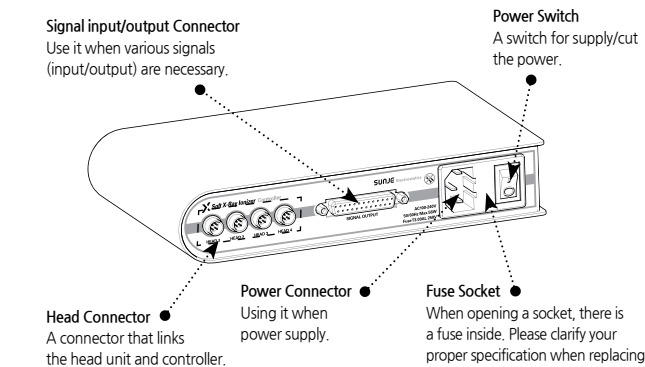
* The following is a standard image of SXC-104T. The image might differ according to other models.

Front



- Indicator Light**
 - Power** Power indicator: Blue LED will be on once the controller is powered on.
 - Interlock** Safety(Interlock) Indicator: For user's safety purpose, Green LED will be on when interlock is safely contacted. (If the light is not on, the head unit is not in working condition)
 - Over Time** Tube replacement Alarm Indicator: Once the unit reaching 7,500hrs of operation, Orange LED will be on.
 - Head Fail** Malfunction Indicator: when false operation, Red LED will be on.
 - Head Selection Indicator**: Blue LED will be on the head you select among the ones(Head1 or 2) are connected to a controller.

Rear



4 Installation and Connection

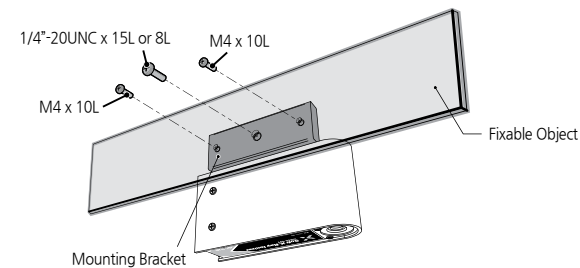
Check the installation conditions head Unit

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

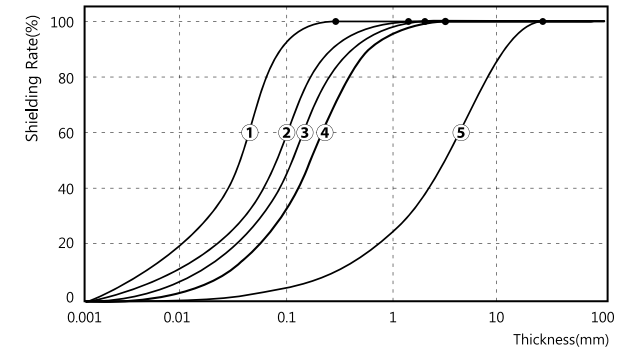
Fix the target product on the fixed area where you install by using supported fixing bolt(s).



Shielding methods

Shielding material selection

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

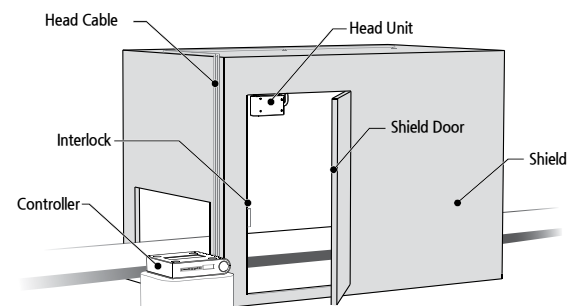


No.	Shield Material	Thickness [mm]
①	Copper	Over 0.4
②	Aluminium	Over 2.0
③	Glass	Over 3.0
④	PVC	Over 5.0
⑤	Acrylic	Over 40.0

- 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

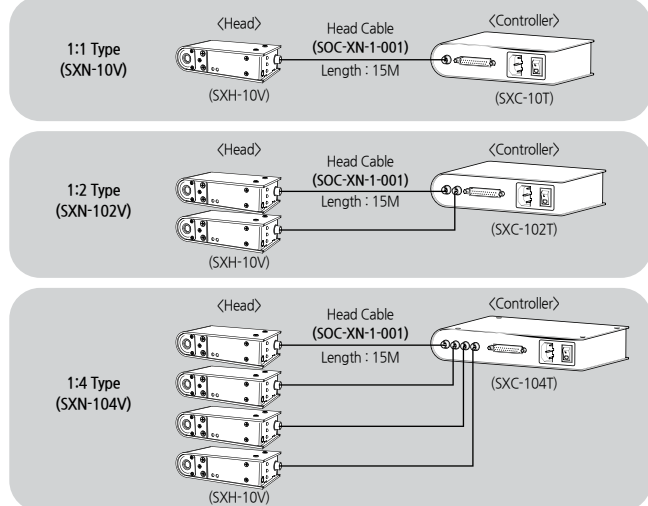
Please refer to the "Installation Compositions" for your references. Please keep your working environment of the leakage radiation level within the range of 10μSv/hr all the time.



How to connect

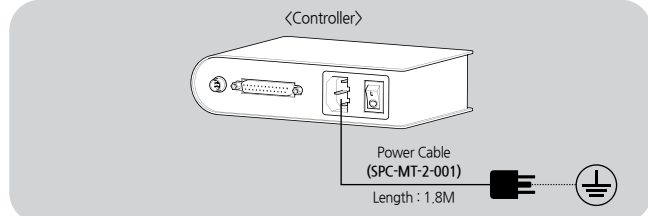
Connecting to the head Unit

Please connect the head and controller unit with supported "Head Cable".



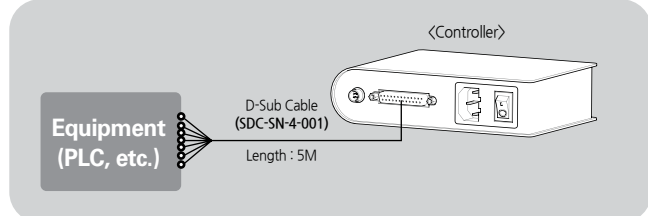
How to connect Earth Ground and Power Supply

Using supported ground and power cables to connect the controller.



Connecting the input & output signal

Please connect the controller and external machinery equipment with supported "D-Sub Cable".



Input/Output Signal Cable Specifications

Division	No.	Pin Name	Labeling	Color	Function
INPUT	1	Remote On	RMT-ON	Black	Remote On / Off (Electrical Contact)
	2	Remote Off	RMT-OFF	White on Black	
	3	Common	RMT-COM	Brown	
	4	Interlock	INT-ON	White on Brown	Interlock On / Off (Electrical Contact)
	5	Interlock	INT-OFF	Red	
OUTPUT	6	Remote(N.O)	RE-N.O	White on Red	Remote On / Off State Output
	7	Remote(Com)	RE-COM	Orange	
	8	Remote(N.C)	RE-N.C	Black on Orange	
	9	Interlock(N.O)	IN-N.O	Yellow	Interlock On / Off State Output
	10	Interlock(Com)	IN-COM	Black on Yellow	
	11	Interlock(N.C)	IN-N.C	Green	
	12	Not Used	-	-	-
	13	Ground	-	Black	-
	14	Power (N.O)	POW-N.O	White on Green	Power On / Off State Output
	15	Power (Com)	POW-COM	Blue	
	16	Power (N.C)	POW-N.C	White on Blue	
	17	Head (N.O)	HEAD-N.O	Violet	Alarm(Over Time) State Output
	18	Head (Com)	HEAD-COM	White on Violet	
	19	Head (N.C)	HEAD-N.C	Gray	
	20	Alarm (N.O)	AL-N.O	Black on Gray	Alarm(Head Fail) State Output
	21	Alarm (Com)	AL-COM	White	
	22	Alarm (N.C)	AL-N.C	Black on White	
23	Not Used	-	-	-	
RS 485	24	Rs-485(+)	RS-485+	Pink	RS 485 Communication
	25	Rs-485(-)	RS-485-	Sky Blue	

5 How to set

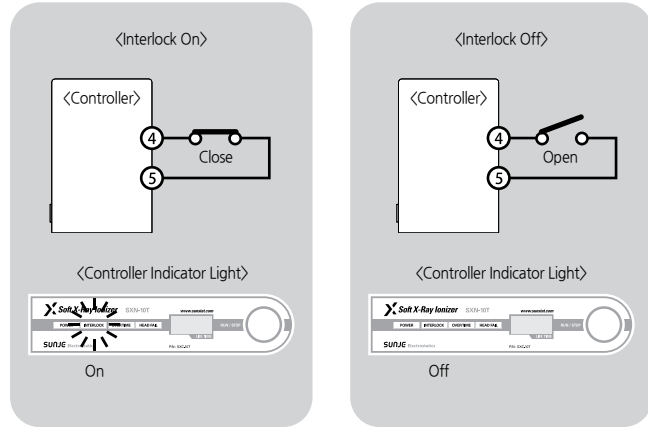
▶ Set the Interlock

Interlock On

If #4 and #5 of a D-sub cable are connected, the interlock is on. When LED is on, it shows that the door is securely locked and totally shielded.
*Interlock indicator (**Interlock**) * light will blink in the front of the controller.

Interlock Off

If #4 and #5 of a D-sub cable are disconnected, the interlock is OFF. When LED is off, it shows that the door is securely unlocked and not shielded well.
*Interlock indicator (**Interlock**) * light will be turned off in the front of the controller".



Article	Interlock On	Interlock Off
D-sub Cable No.	4 - 5 Close	4 - 5 Open
State	The shield door is closed	The shield door is open
Meaning	Normal Operation Standby	Abnormal Operation Standby
Controller Indicator Light	Interlock On	Interlock Off

▶ Set the Remote

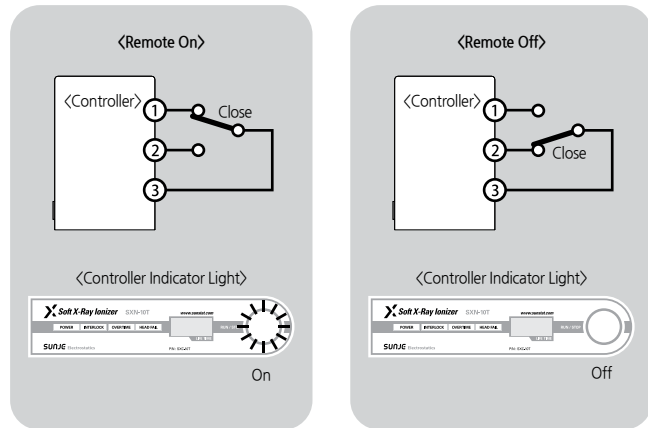
Remote ON

Set-up interlock before setting remote. If the interlock is in OFF, the head unit will not operate even though the remote is ON.

Remote Off

If #2 and #3 of a D-sub cable are connected, the interlock is OFF. Remote OFF indicates that the head unit is not operating.

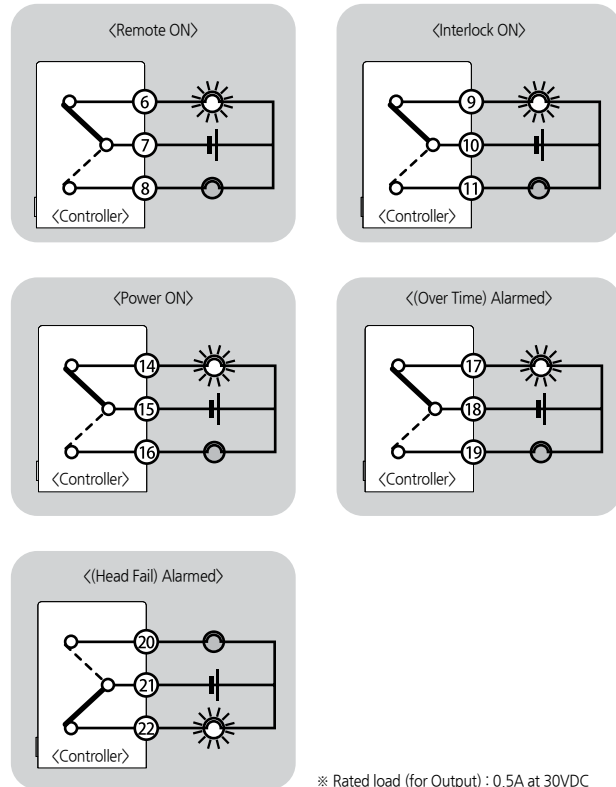
※ Run / Stop Button is available only when you are not using the remote.



Article	Remote On	Remote Off
D-sub Cable No.	1-3 Close	2-3 Close
State	Head starts operating	Head stops operating
Meaning	Ion starts forming	Ion stops forming

▶ Output Status Signal

category	Remote Status Output	Interlock Status Output	Power Status Output	(Over Time) Alarm Status Output	(Head Fail) Status Output
D-sub Cable No.	6-7 Close	9-10 Close	14-15 Close	17-18 Close	21-22 Close
Status	Remote ON	Interlock ON	Power ON	(Over Time) Alarmed	(Head Fail) Alarmed
Meaning	Ion forming	Normal Operation Standby	Power applied	Head Unit: 7,500 Hrs of use	Head unit Malfunction
Controller Indicator	Run / Stop Indicator ON	Interlock Indicator ON	Power Indicator ON	Tube Replacement Alarm Indicator ON	Malfunction Indicator ON



※ Rated load (for Output) : 0.5A at 30VDC

▶ Set the Address

If you want to control the devices at once through RS-485(using communication function), then the proper addresses should be addressed. You can set the address up to #16. (Address setting range: #1 ~ #16)

Entering to Address Mode

Press Run/Stop for 5 sec. after the controller is powered(Power LED ON), you will be entering to the address setting mode.

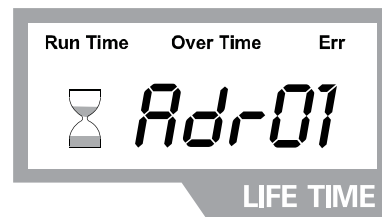
※ The entrance of address mode is enabled only if the interlock is in off condition. Please check whether the interlock LED is set to off.

Assign Address

Once you get into the address mode, the address number sequentially changes from #01 to #16 when you press Run/Stop button promptly.

Address Setting

Wait for 5 sec. after assigning address, then your address is set correctly and automatically exits the address mode.



< Address Mode >

6 Problem solving

▶ Checklist before called

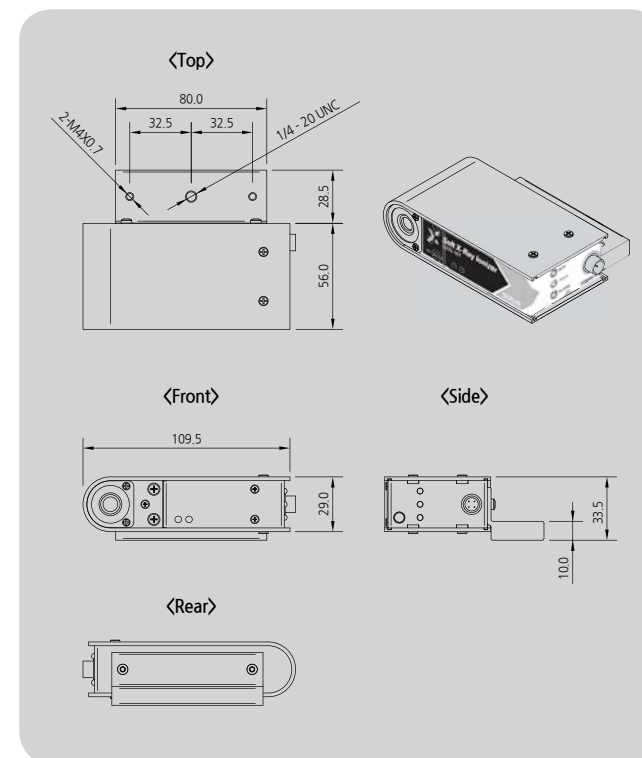
Symptom	Confirmation Matter	Matters of Management
Not Operating	Is your power cable still plugged in?	Please re-plug the power cable and then turn the device on again.
	Was the proper voltage level applied for this set-up?	Please use the proper level of power input for the device. (AC 100~240V, 50/60Hz)
	Is the switch OFF at back of the Controller?	Turn ON the power switch.
	Is a fuse broken?	Replace the proper fuse immediately.
	Is there any Alarm LED on the head unit of device?	Purchase and replace the tube unit(replaceable).
No Signal	Is remote Off?	Clear the remote OFF corresponding to 'Remote Setup' manual.
	Is Interlock Off?	Place Interlock ON corresponding to 'Interlock setup' manual.
Decreased Performance	Can't possibly ground the device?	Please refer to 'Installation & Connection' for(proper) grounding the device.
	Any damages or cut on the cables?	You need to replace the cables if it gets cut or damaged.
Head unit not working (when pressing Run button on the controller)	Is the remote Off control on your machine?	Clear the Remote OFF on your machine.
Error code displayed on the Controller LCD panel	See from manual for [Error code Verification].	

▶ Error Code Verification

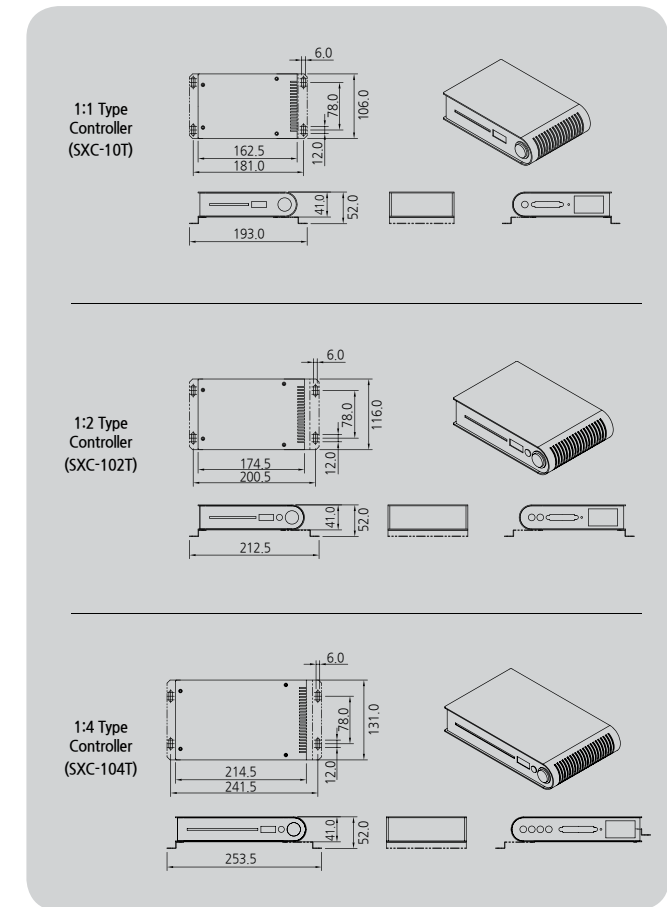
Error Code	Status	Matters of Management
Err 1	initial synchronization false of head unit and controller	Check the connectivity of output cable
Err 2	Disconnecting Communication error due to wire separation or breakage of Communication Cable	Check the status of Head Cable connection. Replace the cable if Head cable gets cut or damaged.
Err 3	Hours of Head unit usage information reception error	Turn the power off and restart it again..
Err 4	Ionization level of the head unit is lower than the minimum current	Replace the Power Module of the Head Unit. Contact us immediately.
Err 5	An excess current detected when the time change of head unit	Replace the Tube Module of the Head Unit. Contact us immediately.

7 Dimensions

▶ Head Unit(SXH-10V)



▶ Controller Unit(SXC-10T / 102T / 104T)



8 Specification

Parameter	Description / Value		
Ion Generation Method	Soft X-ray		
Source	Soft X-ray Tube		
Beam Angle	130°(decay time within 1sec. at 100mm)		
Input Power	AC100~240V, 50/60Hz		
Power Consumption (with Head)	1:1 Type	23W	
	1:2 Type	40W	
	1:4 Type	50W	
Controller Fuse	250V, 3A, 5X20 Glass Type Fuse		
Operation Circumstance	0°C ~ +50°C(32°F ~ 122°F), 35% ~ 85% RH		
Weight	Head	SXH-10V	0.29kg
	Controller	SXC-10T	0.47kg
		SXC-102T	0.60kg
		SXC-104T	0.88kg
Dimensions	Please Refer to Dimension Drawing		
Alarm Function	Head Fail, Head Communication error		
Interface	(Run, Alarm, Power, Over Time, Remote, Interlock) Remote On/Off, Interlock On/Off, Output 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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