

Instruction Manual

SUNJE
Electrostatics

SXN-05B/10B Series (T Type) (Eng)

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 rise 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.

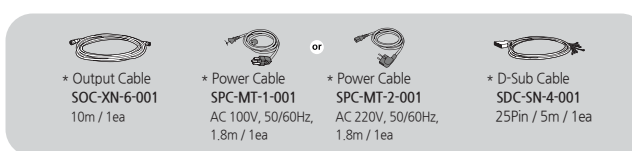
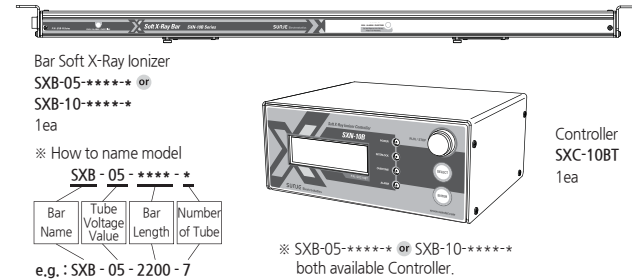
CAUTION

- Do not disconnect the output 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 Bar Soft X-Ray Ionizer, 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

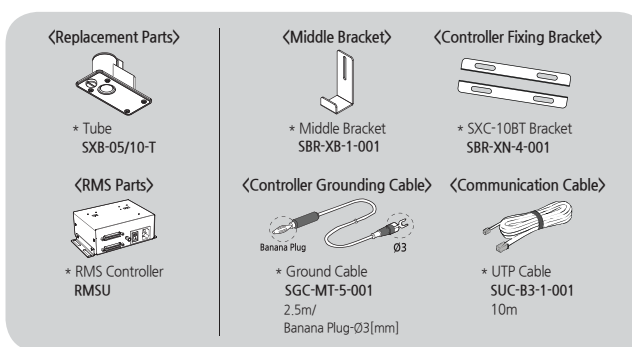
Product compositions

The package includes the following products composition.



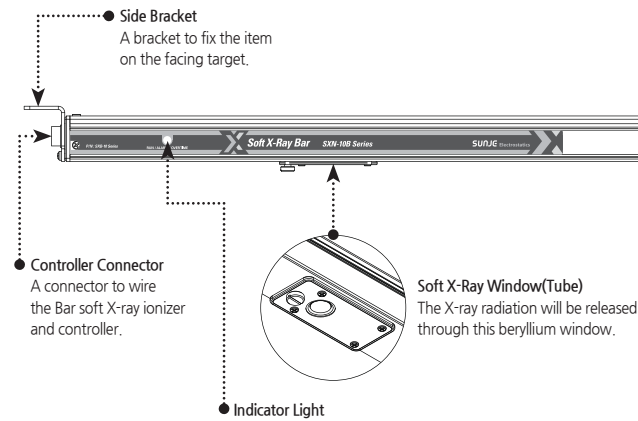
Option

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



3 Nomenclatures of parts

Bar soft X-ray ionizer (SXB-05/10 Series)



RUN / ALARM / OVERTIME

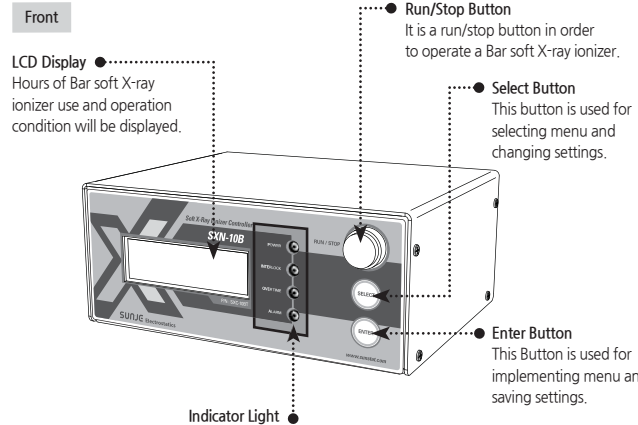
Green LED will be turned on when the product is in operating condition.

When false operation, red LED will be turned on.

Orange LED will be turned on when the lifetime of X-ray tube is exceeded.

If the product is operated continuously after arrival of the replacement cycle, then the orange and green LED will be turned on sequentially.

Controller (SXC-10BT)

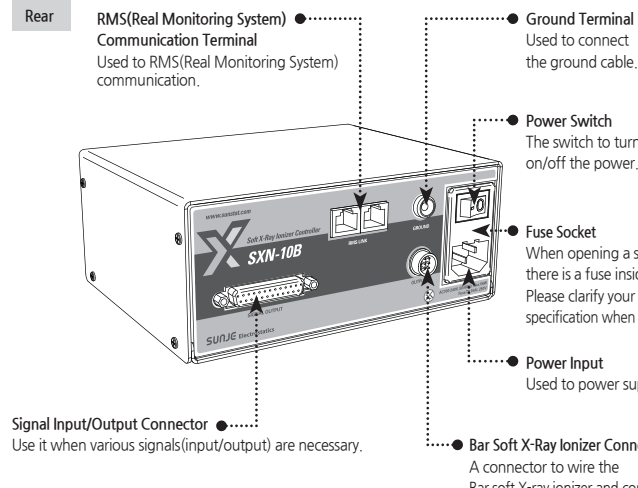


POWER Power Indicator Blue LED will be turned on when the controller is powered on.

INTERLOCK Safety(Interlock) Indicator For user's safety purpose, green LED will be turned on when interlock is safely contacted.

OVERTIME 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 turned on.



4 Installation and connection

Check the installation conditions Bar soft X-ray ionizer

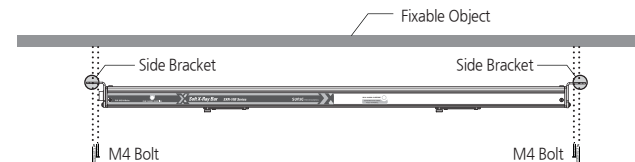
Please check the installation condition whether it meets proper specification.

- 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.

Bar soft X-ray ionizer installation

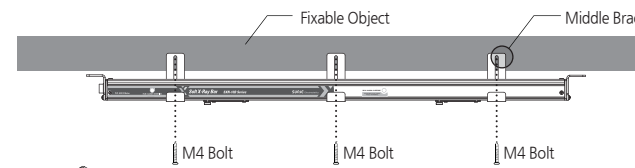
Basic Installation

Please fixing firmly to wall or rack by M4 bolts on side bracket.



Installation by Middle Brackets (Option)

If Bar soft X-ray ionizer cannot be installed using side bracket, it is recommended to install it using middle bracket. Please fix the middle bracket with M4 Bolts.



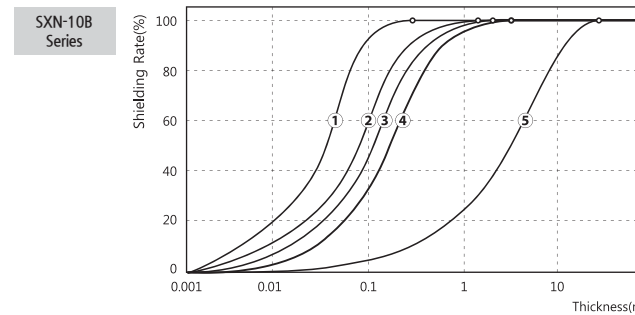
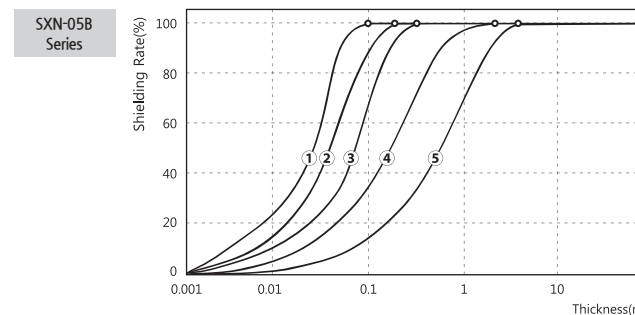
※ Middle Bracket Recommended Quantity

Model	Middle Bracket QTY
SXB-05/10-600 ~1800	2ea
SXB-05/10-2200 ~ 3400	3ea

Shielding method

Shielding Material Selection

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



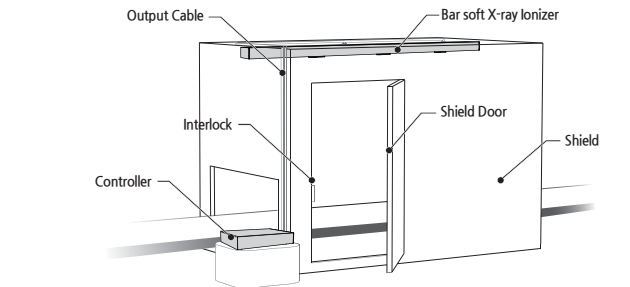
No.	Shield Material	Thickness [mm]	
		SXN-05B Series	SXN-10B Series
①	Copper	Over 0.1	Over 0.4
②	Aluminium	Over 0.25	Over 2.0
③	Glass	Over 0.5	Over 3.0
④	PVC	Over 3.0	Over 5.0
⑤	Acrylic	Over 5.0	Over 40.0

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 soft X-ray device on/off when the door is opened/closed.

Shield installation compositions

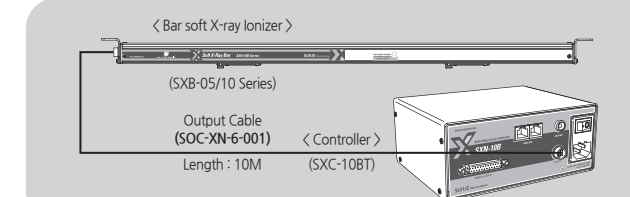
Please refer to the "Installation Compositions" for your references. Please keep your working environment of the leakage radiation level within the range of 10 μ Sv/hr all the time.



How to connect

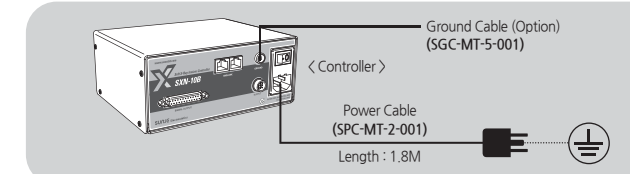
Connecting the Bar soft X-ray ionizer

Please connect the Bar soft X-ray ionizer and controller with supported "Output Cable".



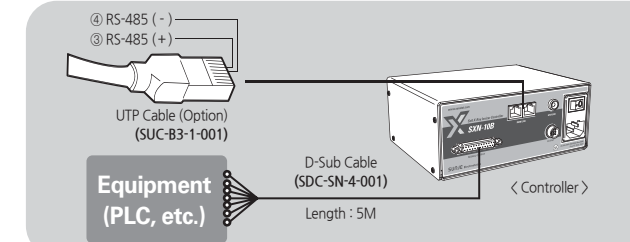
Connecting the Ground and Power

Using supported ground and power cables to connect the controller.



Connecting the Input & Output Signal Cable and Communication Cable

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



Input/Output Signal Cable Specifications (D-Sub Cable)

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	Interlock On/Off (Electrical Contact)	
	4	INTERLOCK	INT-ON	White on Brown		
	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	Interlock On/Off State Output	
	9	INTERLOCK(N.O)	IN-N.O	Yellow		
	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	Over Time State Output	
	17	Over Time (N.O)	HEAD-N.O	Violet		
	18	Over Time (COM)	HEAD-COM	White on Violet		
	19	Over Time (N.C)	HEAD-N.C	Gray	Alarm(Abnormal) State Output	
	20	ALARM (N.O)	AL-N.O	Black on Gray		
21	ALARM (COM)	AL-COM	White			
22	ALARM (N.C)	AL-N.C	Black on White	-		
23	NOT USED	-	-			
24	RS-485(+)	RS-485+	Pink		RS 485 Communication	
25	RS-485(-)	RS-485-	Sky Blue			

5 How to set

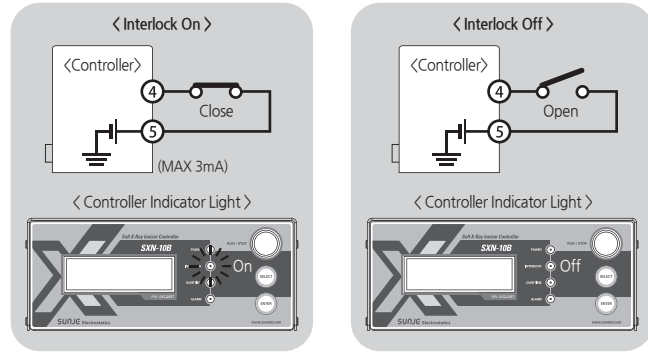
▶ Set the interlock

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 be turned on 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 on, 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

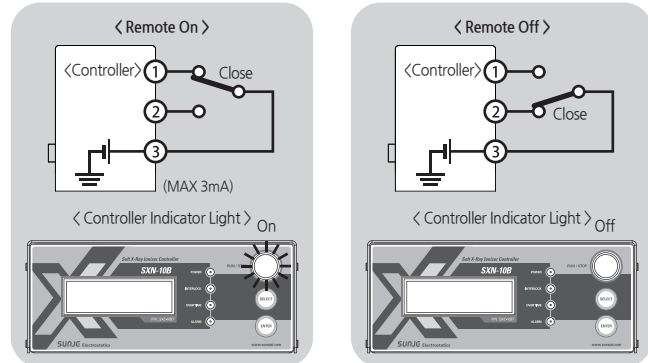
▶ Set the remote

Remote On

Under interlock ON condition, Remote is set. Remote ON means that ion generates as Bar soft X-ray ionizer is working. If #1 and #3 of a D-Sub cable are connected, the remote is on.

Remote Off

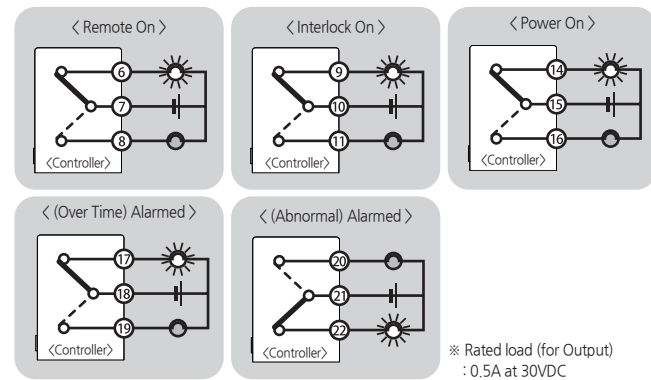
Under interlock ON condition, Remote is set. Remote OFF indicates that the Bar soft X-ray ionizer is not operating. If #2 and #3 of a D-Sub cable are connected, the remote is off.
 ※ The Run/Stop button is available when you don't use remote.
 ※ If the interlock is in off, the Bar soft X-ray ionizer will not operate even though the remote is on.



Article	Remote On	Remote Off
D-Sub Cable No.	1-3 Close	2-3 Close
State	Bar soft X-ray ionizer starts operating	Bar soft X-ray ionizer 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	Alarm(Abnormal) 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	(Abnormal) Alarmed
Meaning	Ion forming	Normal Operation Standby	Power applied	Allowable tube lifetime elapsed.	Bar soft X-ray ionizer 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

6 Maintenance

WARNING

- 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 Replacement

If there are any malfunction or lifetime excess on the tube, please purchase the new tube and replace it according to the following procedure.

CAUTION

- 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.
- A H/V connector of tube is protruded. After unscrew the bolts, pull the unit vertically. Please be careful when replacing H/V connector.
- After replacement, check if tube and Bar soft X-ray ionizer body are connected correctly. Unless they are connected properly, ground could be unstable.
- Do not unscrew any bolts other than fixing bolts. If unscrewed, it can occur fire, electric shock, and breakages.

- Unscrew a Fixing Bolt**
Unscrew tube fixing bolt by turning in a counter-clockwise using hands or screw driver.
- Separating Tube**
Pull a tube vertically against the Bar soft X-ray ionizer, once you unscrewed fixing bolts. Please discard tube autonomously or contact us to disuse.
- Replacing New Tube**
Push a new replacing tube vertically firmly until it connects high-voltage connector properly.
- Screw a Fixing Bolt**
When a new tube is combined, screw the tube fixing bolt by turning in a clockwise direction to fix using hands or screw driver.

※ Please implement the tube reset in a controller after replacing a tube. (Refer to SXC-10BT/BL manual)
 ※ Don't separate a tube fixing bolt from a tube.

7 Problem solving

▶ Checklist before called

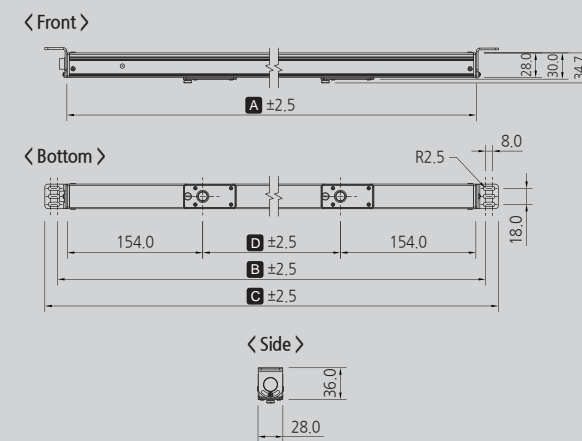
Symptom	Confirmation Matter	Matters of Management
Not operating	Is your power cable still plugged in?	Please re-plug the power cable and then turn the device on again.
	Was the proper voltage level applied for this set-up?	Please use the proper level of power input for the device. (AC 100~240V, 50/60Hz)
	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 tube replacement LED on the device?	Purchase and replace the tube unit(replaceable).
	Is remote off?	Clear the remote off corresponding to 'Remote Setup' manual.
Device might operate abnormally.	Is the controller set correctly to the connected model?	Set the proper number of tube referring to 'Menu - 4. Ctrl Set' list in SXC-10BT/BL manual.
	No signal	Have you followed the proper procedure for input/output signal cable(s)? Check whether the cable connection is properly done.
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.
Device is 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 2	Internal system error of a Bar soft X-ray ionizer	Please contact us if the unit doesn't work properly. Within the warranty period, the expected charges will be free on your side.
Err 4	Ionization level of the Bar soft X-ray ionizer is lower than the minimum current	Replace the tube of the Bar soft X-ray ionizer. Contact us immediately.

8 Dimensions

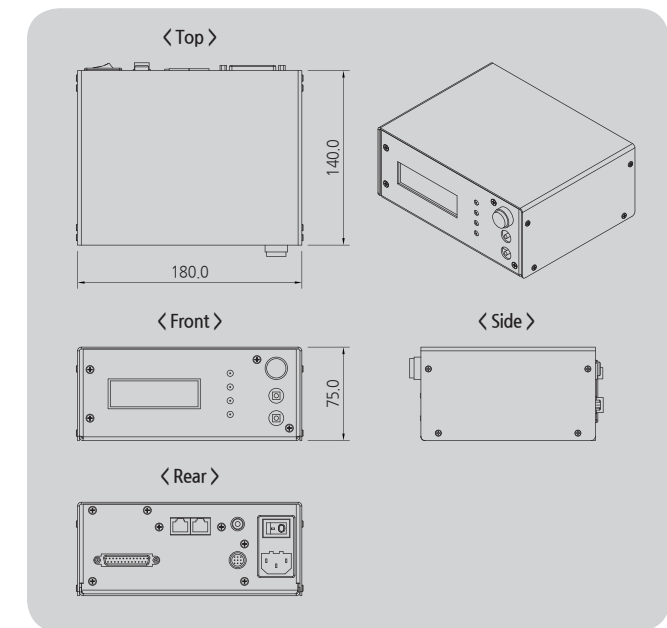
▶ Bar soft X-ray ionizer (SXB-05/10 Series)



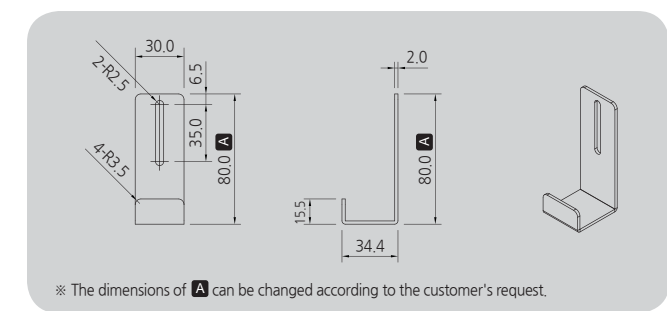
No.	MODEL No.	A	B	C	D	TUBE QTY	Weight
1	SXB-05-300-1	SXB-10-300-1	308	329	385	1	0.35kg
2	SXB-05-600-2	SXB-10-600-2	619	640	669	2	0.65kg
3	SXB-05-900-3	SXB-10-900-3	930	951	980	3	0.95kg
4	SXB-05-1200-4	SXB-10-1200-4	1241	1262	1291	4	1.25kg
5	SXB-05-1500-5	SXB-10-1500-5	1552	1573	1602	5	1.55kg
6	SXB-05-1800-6	SXB-10-1800-6	1863	1884	1913	6	1.85kg
7	SXB-05-2200-7	SXB-10-2200-7	2174	2195	2224	7	2.15kg
8	SXB-05-2500-8	SXB-10-2500-8	2485	2506	2535	8	2.45kg
9	SXB-05-2800-9	SXB-10-2800-9	2796	2817	2846	9	2.75kg
1	SXB-10-900-2		930	951	980	2	0.80kg
2	SXB-10-1500-3		1552	1573	1602	3	1.20kg
3	SXB-10-2200-4		2174	2195	2224	4	1.65kg
4	SXB-10-2800-5		2796	2817	2846	5	2.05kg
5	SXB-10-3400-6		3418	3439	3468	6	2.45kg

※ Model line up is changeable depending on Tube Pitch (D) and Tube Q'ty except for regular Line Up above.
 - Tube Pitch can be changed within the range of 311~622mm.
 - Tube Q'ty Max. 9ea

▶ Controller (SXC-10BT)



▶ Middle Bracket (Option)



9 Specification

Parameter	Description / Value
Ion Generation Method	Soft X-ray
Source	Soft X-ray Tube
Beam Angle	150°
Input Power	AC 100~240V, 50/60Hz
Power Consumption (with Bar)	Max. 130W
Operation Circumstance	0°C ~ +50°C(32°F ~ 122°F), 35% ~ 85% RH
Dimensions	Please Refer to Dimension Drawing
Alarm Function	H/V Abnormal, Communication Error
Interface	(Run, Alarm, Power, Over Time, Remote, Interlock) Remote On/Off, Interlock On/Off, Output State
Controller Fuse	250V, 3A, 5X20 Glass Type Fuse
Weight	Controller (SXC-10BT) 1.05kg
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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