Instruction Manual   SUNJE

SXC-10BL   (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.

❶ 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.
* 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.
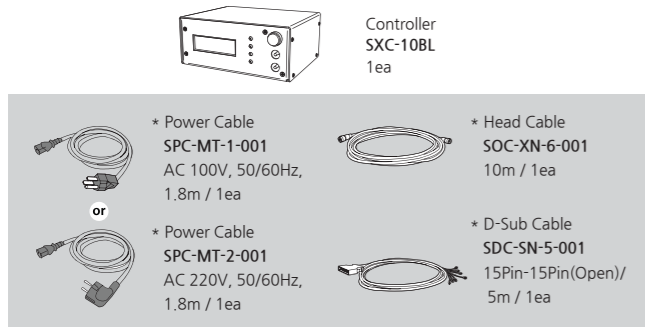
❗ CAUTION

* 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.
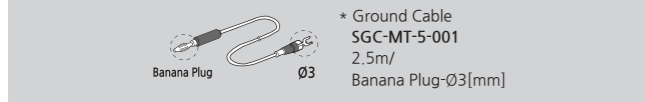
❷ Check the package contents

▶ Product compositions
The package includes the following products composition.

Controller
SXC-10BL
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-6-001
10m / 1ea
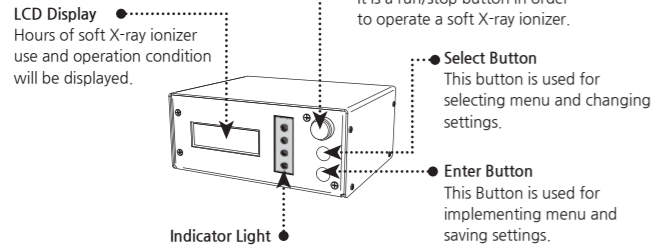
* D-Sub Cable
SDC-SN-5-001
15Pin-15Pin(Open)/
5m / 1ea

▶ Option
If you require extra functions with the basic accessories we provided, you need to purchase optional items in below for further assistant.
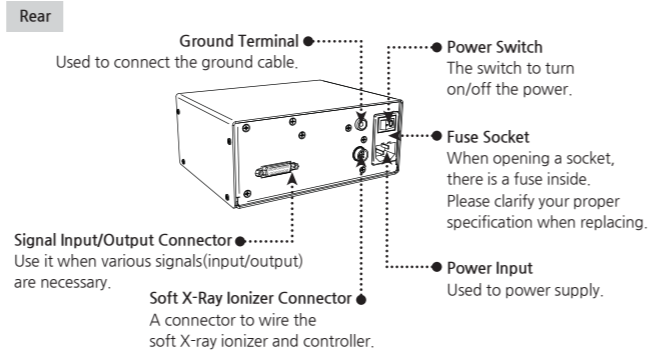
* Ground Cable
SGC-MT-5-001
2.5m/
Banana Plug-Ø3[mm]

Banana Plug   Ø3

❸ Nomenclatures of parts

Front

LCD Display
Hours of soft x-ray ionizer use and operation condition will be displayed.

● Run/Stop Button
It is a run/stop button in order to operate a soft x-ray ionizer.

● Select Button
This button is used for selecting menu and changing settings.

● Enter Button
This Button is used for implementing menu and saving settings.

Indicator Light

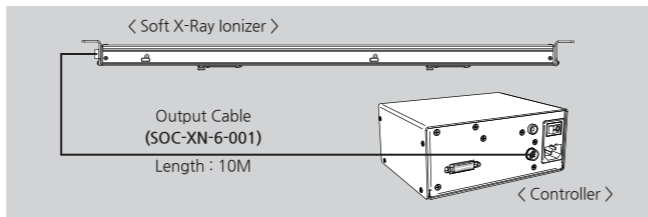| POWER : Power Indicator	Blue LED will be turned on when the controller is powered on.
INTERLOCK : Safety(Interlock) Indicator	For user's safety purpose, green LED will be turned on when interlock is safely contacted.
OVERTIME : Tube Replacement Alarm Indicator	Orange LED will be turned on when the lifetime of X-ray tube is exceeded.
ALARM : Malfunction Indicator	When false operation, red LED will be turned on.

Rear

Ground Terminal
Used to connect the ground cable.

● Power Switch
The switch to turn on/off the power.

● Fuse Socket
When opening a socket, there is a fuse inside. Please clarify your proper specification when replacing.

Signal Input/Output Connector
Use it when various signals(input/output) are necessary.

Soft X-Ray Ionizer Connector
A connector to wire the soft x-ray ionizer and controller.

● Power Input
Used to power supply.

❹ Installation and connection

▶ Soft X-ray Ionizer connectable with SXC-10BL

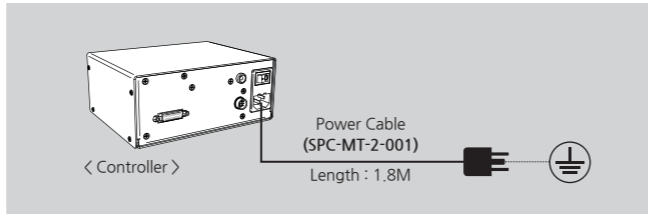| 5kV		10kV	15kV
SXB-05N	SXB-05SP1R	SXB-10N	SXH-15NH
SXB-05NR	SXB-05SP1RL	SXB-10W	
SXB-05NRL	SXB-05SP2		
SXB-05NS	SXB-05SP2L		
SXB-05NSR	SXB-05NRD		
SXB-05NSRL	SXB-05WR		

▶ How to connect

Connecting the soft x-ray Ionizer

Please connect the soft x-ray ionizer and controller with supported "Output Cable".
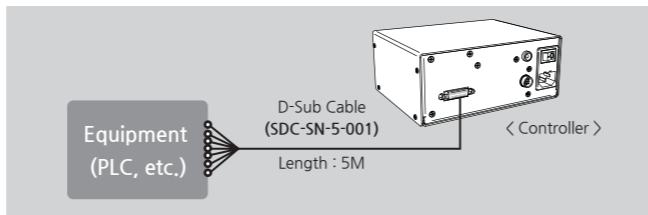
〈 Soft X-Ray Ionizer 〉

Output Cable
(SOC-XN-6-001)
Length : 10M

〈 Controller 〉

Connecting the Ground and Power

Using supported ground and power cables to connect the controller.
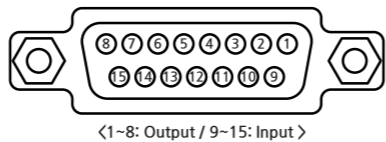
〈 Controller 〉

Power Cable
(SPC-MT-2-001)
Length : 1.8M

Connecting the Input & Output Signal Cable

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

Equipment
(PLC, etc.)

D-Sub Cable
(SDC-SN-5-001)
Length : 5M

〈 Controller 〉

Output Signal NO.

15Pin D-Sub

〈1~8: Output / 9~15: Input 〉

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

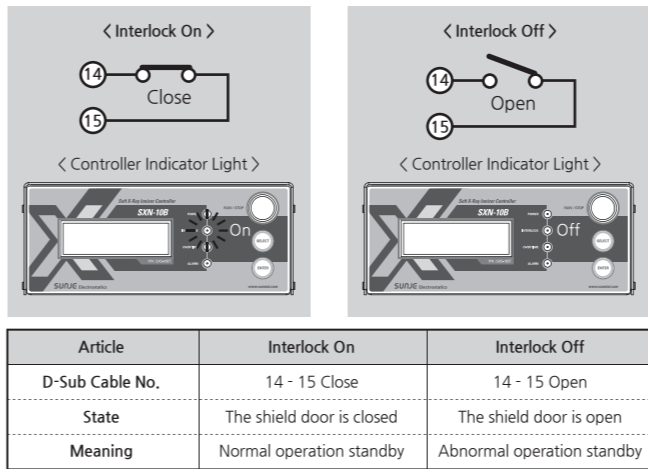| Division	No.	Pin Name	Descriptions	Function	
OUTPUT	1	GND	GND	-	
	2	Power State	Indicator Power State	Power Status output (When Power On - 5V, 1mA)	
	3	Interlock State	Indicator Interlock State	Interlock status output (When Interlock On - 5V, 5mA)	
	4	Run State	Indicator Run State	RUN status output (When It Runs - 5V, 5mA)	
	5	Alarm State	Alarm Output	Alarm state output (When It Alarms - 5V, 5mA)	
	6	N.C	No Connected	No Connected	
	7	N.C	No Connected	No Connected	
	8	N.C	No Connected	No Connected	
INPUT	9	Remote-Mode	Remote Mode Select	Single Contacting / Dual Contacting Mode Select (Electrical Contact)	
	10	Mode-COM	GND		
	11	Remote-ON	Remote ON	1 contacts using	2 contacts using
	12	Remote-OFF	Remote OFF	11-13: Close → ON 11-13: Open→ OFF	11-13: Close → ON 11-13: Open → ON(Keep)
	13	Remote-COM	GND		12-13: Close → OFF
	14	Interlock-COM	GND	Interlock ON / OFF(Electrical Contact)	
	15	Interlock-ON	Interlock ON/OFF		

❺ 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.

〈 Interlock On 〉   〈 Interlock Off 〉

14 Close 15   14 Open 15

〈 Controller Indicator Light 〉 On   〈 Controller Indicator Light 〉 Off

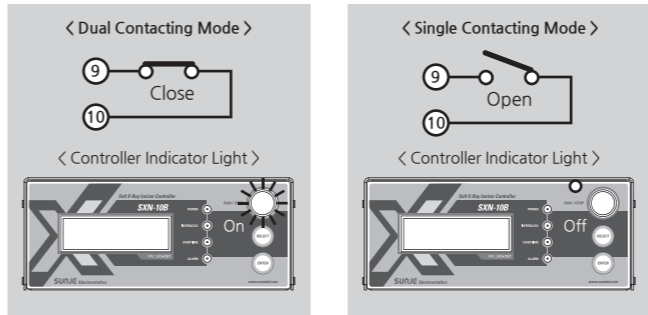| Article	Interlock On	Interlock Off
D-Sub Cable No.	14 - 15 Close	14 - 15 Open
State	The shield door is closed	The shield door is open
Meaning	Normal operation standby	Abnormal operation standby

▶ Set the remote mode

In the remote mode, there are "Dual Contacting Mode" and "Single Contacting Mode".
- If remote mode on / off(9) is connected to com(10) in the interface. (Dual interlock contacting mode)
- If remote mode on / off(9) is not connected(e.g.Open) to com(10) in the interface. (Single interlock contacting mode)
- If dual interlock contacting mode is entered, remote led will be blink.
- The remote can be operated only if the interlock in on.
  In interlock off, the head unit will not be operated even though the remote is on.
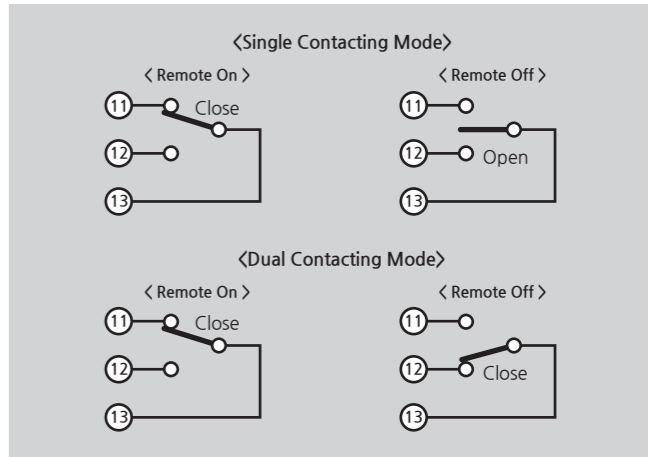
Dual Contacting Mode : Remote on / Remote off (Have a 2 contacting)
Single Contacting Mode : Remote on (Have a 1 contacting)

〈 Dual Contacting Mode 〉   〈 Single Contacting Mode 〉

9 Close 10   9 Open 10

〈 Controller Indicator Light 〉 On   〈 Controller Indicator Light 〉 Off

Article	Dual Contacting Mode	Single Contacting Mode
D-Sub Cable No.	9 - 10 Close	9 - 10 Open

▶ Single Contacting Mode / Dual Contacting Mode remote set

〈Single Contacting Mode〉

〈 Remote On 〉   〈 Remote Off 〉

11 Close 12 13   11 12 Open 13

〈Dual Contacting Mode〉

〈 Remote On 〉   〈 Remote Off 〉

11 Close 12 13   11 12 Close 13

❗ CAUTION
* The Remote off will be operated preferentially when 12pin and 13pin closed regardless of Uni point contact / Dual point contact mode.
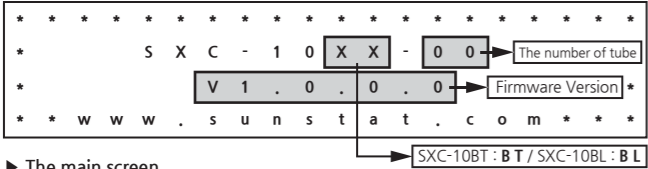
❻ Problem solving

▶ 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. (AC 100~240V, 50/60Hz)
	Is the swith 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.
	Is Interlock Off?	Place Interlock On corresponding to 「Interlock setup」 manual.
Device might operate abnormally.	Is the controller set correctly to the connected model?	Set the proper number of tube refering to 「▶ Menu - 4. Ctrl Set」 list in SXC-10BL 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 isn't 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	Solution
Err 2	Internal system error of a 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 Soft X-ray ionizer is lower than the minimum current	Replace the Tube of the Soft X-ray ionizer. Contact us immediately.

❼ SXC-10BL operations

▶ When it powers on
After dispalys for 2 seconds, it switch to the main screen.

```
* * * * * * * * * * * * * * * * *
*        S X C - 1 0 X X - 0 0      →  The number of tube
*        V 1 . 0 . 0 . 0            →  Firmware Version        *
* * w w w . s u n s t a t . c o m  *
                                    →  SXC-10BT : B T / SXC-10BL : B L
```

▶ The main screen

Normal condition

⟨ Page 1 ⟩
```
1 . h h h h h              2 . h h h h h
3 . h h h h h              4 . h h h h h
5 . h h h h h              6 . h h h h h
7 . h h h h h              8 . h h h h h
```

⟨ Page 2 ⟩
```
9 . h h h h h              A . h h h h h
B . h h h h h              C . h h h h h
```

- It indicates total used hours of tube.
- It shows " - - - - - " on display when the tube doesn't connected.
- When the 9 tubes connected, push select button to go to ⟨ Page2 ⟩.
  (Under 8 tubes, it doesn't go to ⟨ Page 2 ⟩.)

When the alarm occurred

ex) When the H/V alarm occurred in no.3 and no.5 tube

⟨ Page 1 ⟩
```
1 . h h h h h              2 . h h h h h
3 . AL - 0 4               4 . h h h h h
5 . AL - 0 4               6 . h h h h h
7 . h h h h h              8 . h h h h h
```

⟨ Page 2 ⟩
```
9 . h h h h h              A . h h h h h
B . h h h h h              C . h h h h h
```

- It shows alarm information and tube number that alarm occurred.
- It shows alarm information and usage time of the tube that alarm occured every 5 seconds alternately.
- Alarm information meaning

	AL-04 (H/V abnormal)	AL-02 (Internal system error)
SXC-10BT	Always display	Always display
SXC-10BL	Display while Soft X-Ray Ionizer working	Display in case of Interlock On

▶ Menu
Press the enter button to switch to the menu screen.

```
1 . T o t a l   T i m e     : [ O ]
2 . T u b e     I n f o     : [   ]
3 . T u b e     R e s e t   : [   ]
4 . C t r l     S e t       : [   ]
```

1. Selecting Menu
- You can select a menu sequentially via pushing the select button.
2. Run the Menu
- You can run the menu via pushing the enter button.

1. Total Time

Indicating each tube's usage time

```
1 . h h h h h              2 . h h h h h
3 . h h h h h              4 . h h h h h
5 . h h h h h              6 . h h h h h
7 . h h h h h              8 . h h h h h
```

- It shows each tube's usage time and alarm information.
  ※ Refer to operational method on page 05 " ▶ Main screen ".

2. Tube Info (Tube Information)

Indicating each tube's information : It is possible to check each tube's condition.
(Usage time, Alarm, Overtime)

```
* T u b e 1 *
T i m e                 : h h h h h
A l a r m                : O f f
O v e r T i m e          : O f f
```

1. *Tube1*
- You can change a tube number sequentially via pushing the select button.
2. Time condition
- It indicates tube's usage time.
3. Alarm condition
  1) AL-04 : H/V abnormal   2) AL-02 : Internal system error
4. Overtime condition
  1) On : It means that replacement cycle is come.
  2) Off : It means that the tube is still available.

3. Tube Reset

Checking the tube reset information.

1) Normal conditions

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . h h h h h
           5 . - - - - -      6 . - - - - -
           7 . - - - - -      8 . - - - - -
```

- You can run the tube reset in interlock off condition.
- It shows each tube's reset information. (Up to 8ea)
- It indicates informations as the number of time reset.
  ex) If you run time reset 3 times, then you can see the information from no.1 to no.3.
  No.4 shows current tube's usage time. From no.5, it shows " - - - - - ".
- If you run time reset over 8 times, then 9th information will be indicated in no.8.
- You can check each tube's reset information via pushing the select button sequentially.

2) When the Alarm or Overtime occurred

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . AL - 0 4
           5 . - - - - -      6 . - - - - -
Reset      7 . - - - - -      8 . - - - - -
```

- The tube that has alarm occurred or overtime used shows status information instead of the current time.
  ※ AL-04 : H/V abnormal / Over : Overtime (It doesn't indicates internal error.)
- It is possible to reset in the tube that has alarm, overtime problems.
  ※ Reset sign on the displiy in the lower left will blink.
  ※ Even if you reset before the overtime, the time of use is maintained.

3) How to Tube Reset

⚠ **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 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.

※ Tube reset of SXB-05NRD is avaiable only with SXB-DS. Please check the SXB-DS manual.

① Tube seperation
  - Turn off the power switch at the rear of the controller, and separate the tube

▼

② Tube combination
  - When the tube replacement is complete, turn on the power switch at the rear of the controller.
  ※ Refer to the Soft X-ray Bar Manual for tube replacement.

▼

③ Checking the tube reset information

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . AL - 0 4
           5 . - - - - -      6 . - - - - -
Reset      7 . - - - - -      8 . - - - - -
```

- It is possible to reset in the tube that has alarm, overtime problems.
- Select the tube that need reset in Interlock off condition.

▼

---

④ For tube reset execution

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . Proc
           5 . - - - - -      6 . - - - - -
Reset      7 . - - - - -      8 . - - - - -
```

- Execute the tube reset pushing Run/Stop button for more than 5 seconds.
- After execute tube reset, wait about 5 seconds.

▼

⑤ - 1 When tube reset succeed

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . Reset
           5 . - - - - -      6 . - - - - -
Reset      7 . - - - - -      8 . - - - - -
```

- When tube reset succeed, controller will be stop.
- Controller will be operated normally after turn off and turn on the switch at the rear of the controller sequentially.

▼

⑤ - 2 When tube reset failed

```
T u b e    1 . h h h h h      2 . h h h h h
0 1        3 . h h h h h      4 . Error
           5 . - - - - -      6 . - - - - -
Reset      7 . - - - - -      8 . - - - - -
```

- When tube reset failed, controller will be stop.
- Turn off and turn on the switch at the rear of the controller sequentially, and try again after checking the tube reset method.

4. Ctrl Set (Controller Setting)

RMS(Real Monitoring System) for communication Address Setting and setting of the number of connected tube.

```
A d d r e s s                   : - -
T u b e   N u m b e r           : - -
I / F     O v e r t i m e       : - -
I / F     A l a r m             : - -
```

1. Set the address value
- You can change address value sequentially via pushing the Select button. (1~16)
2. Set the number of tube
- Press Select button and you can change the number of tube in order. (1~12)
3. Overtime I/F setting (SXC-10BT Only)
- Press Select button and it can be changed.
  1) ON : Use as Overtime Interface   2) OFF : Use as Alarm Interface
4. Alarm I/F setting (SXC-10BT Only)
  1) ON : Interface alarm indicates when Soft X-Ray Ionizer stops.
  2) OFF : Interface alarm does not indicate when Soft X-ray Ionizer stops.

※ You can run the controller setting in Interlock off condition.
※ When you press Enter button after setting, next setting change is possible.
※ It blinks at interval in a second while you are setting on.

After all setting is done, the screen below appears and changed setting is saved at the same time.

```
              P l e a s e
            P o w e r   O f f
```

- It operates with changed setting figure when you turn the switch on again.
- If there is no change on setting, it does not show Power off, but moves to menu screen.

▶ Interlock Off
Tube rese, Controller setting can be run in Interlock off condition. If you try to rua Tube reset, Controller setting in Interlock On condition, you can see the screen in the below on the display.

```
              P l e a s e
          I n t e r l o c k   O f f
```

※ How to cancel : To switch to the menu screen, wait more than 5 seconds or pressing the enter button.
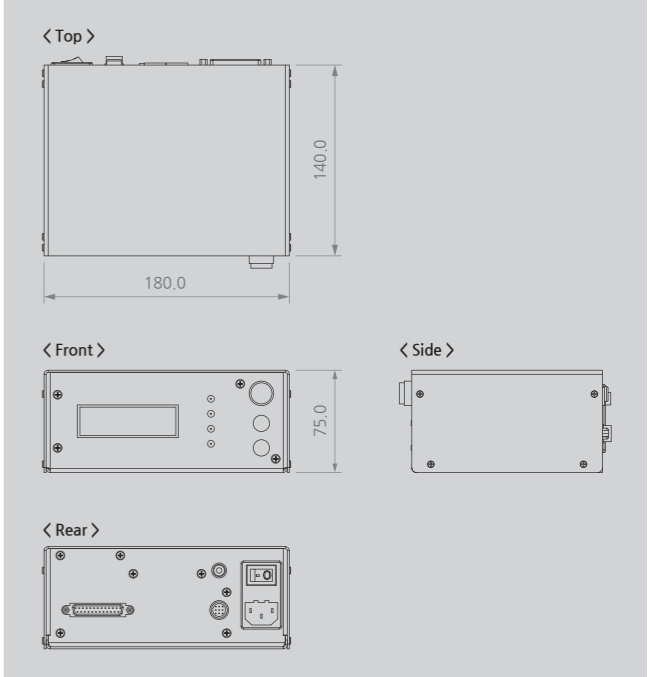
▶ Bar Connect
The screen in the below indicated, but that Soft X-ray Ionizer is not connected when run the tube reset.

```
                  N O
            B a r   C o n n e c t
```

※ How to cancel : To switch to the menu screen, wait more than 5 seconds or pressing the enter button.

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❽ Dimensions

⟨ Top ⟩   140.0   180.0

⟨ Front ⟩   75.0   ⟨ Side ⟩

⟨ Rear ⟩

❾ Specification

Parameter	Description / Value
Input Power	AC 100~240V, 50/60Hz
Power Consumption (with Bar)	Max. 130W
Operation Circumstance	0℃ ~ +50℃(32℉ ~ 122℉), 35% ~ 85% RH
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	1.05kg
Warranty	1 year

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