

VSN-15G

INSTRUCTION MANUAL



Head : VSH-15G



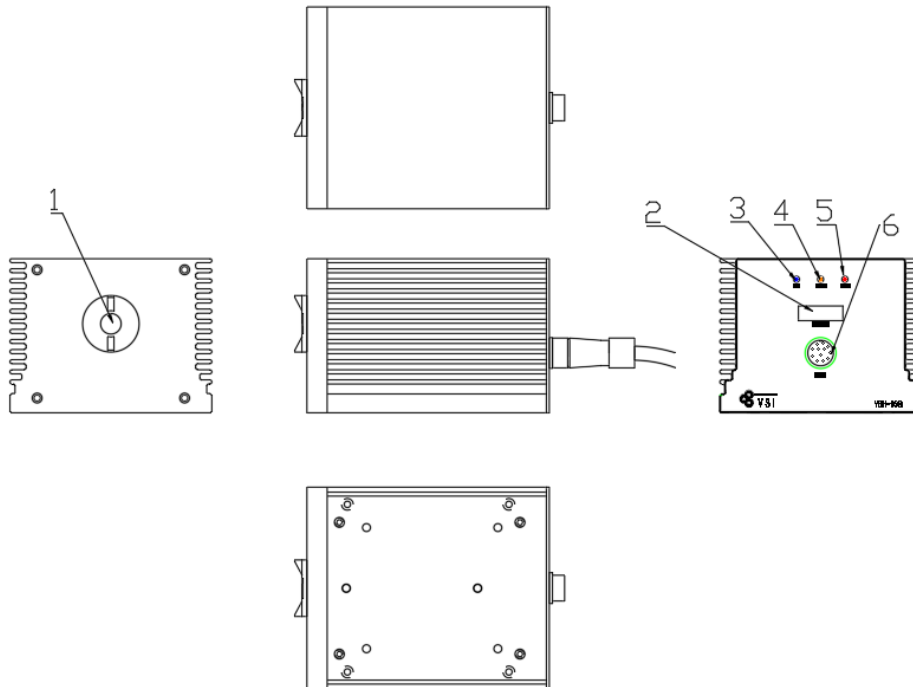
Controller : VSC-15G

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1. Part Names and Functions

■ Head (VSH-10G)



1) Soft X-Ray window

A window that irradiates the soft X-ray that ionizes the air to eliminate static electricity.

2) Timer LCD

The usage time (unit: hour) of the head is displayed.

3) Run Indicator (Green Light)

It turns on when the soft X-ray is being irradiated.

4) Timer Indicator (Yellow Light)

It turns on when it operates over the Guaranteed Operation Time (10,000hrs).

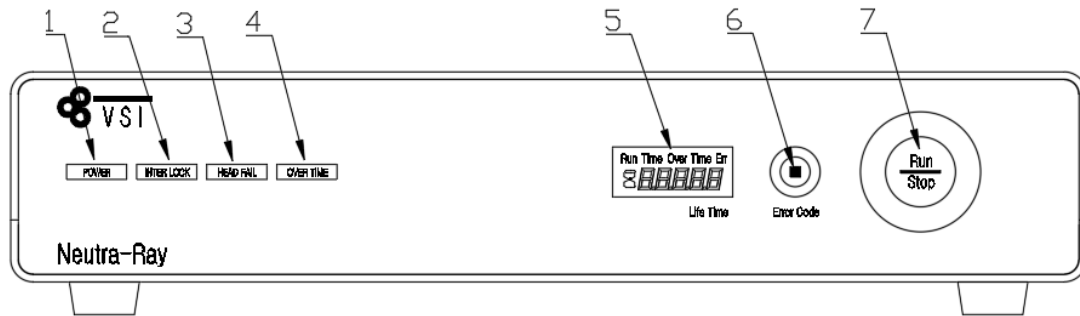
5) Alarm Indicator (Red Light)

It turns on in case of abnormal the Head.

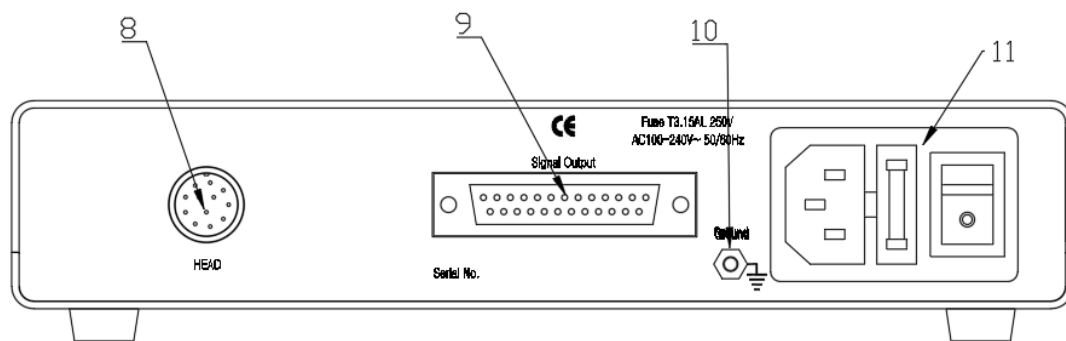
6) Controller Connector

It connects the 12pin female cable that connects to the controller.

■ Controller (VSC-15G)



Front Panel

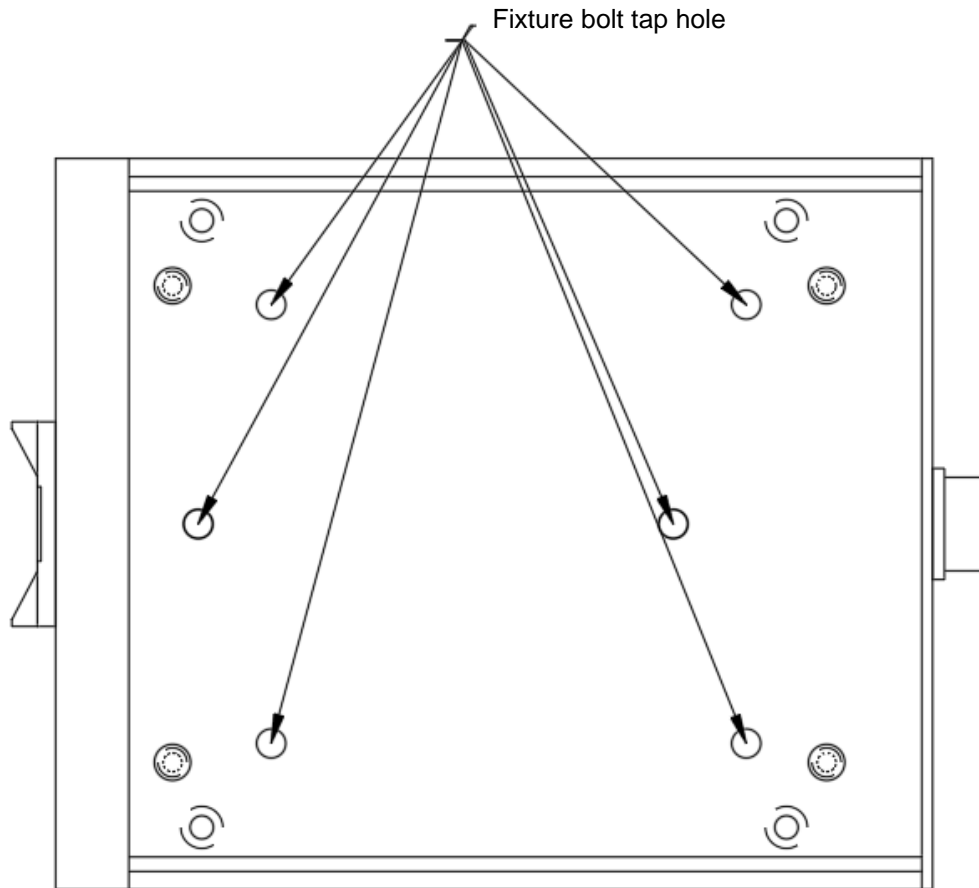


Rear Panel

- ① **Power(Green Light)** : Green light will come on when the controller is powered.
- ② **Interlock(Yellow Light)** : It is a safety indicator lamp before soft X-ray is irradiated and it comes on when the interlock is connected.
- ③ **Head Fail (Red Light):** It will come on when abnormal head operation occurs
- ④ **OverTime (Yellow Light):** It turns on in case of OverTime
- ⑤ **Timer LCD** : It displays operation time of the head
- ⑥ **Error Code Switch** : It displays the error code information
- ⑦ **Run/Stop Switch** : The switch to irradiate the soft X-ray
- ⑧ **Head Connector** : It connects the 12pin connector that connects to the Head.
- ⑨ **Signal Output Connector** : A connector that is used to connect with external devices.
- ⑩ **Ground Terminal:** This is the controller ground bolt.
- ⑪ **AC Inlet** : This is the AC power inlet.

2. Installation and Operation

■ Head Installation



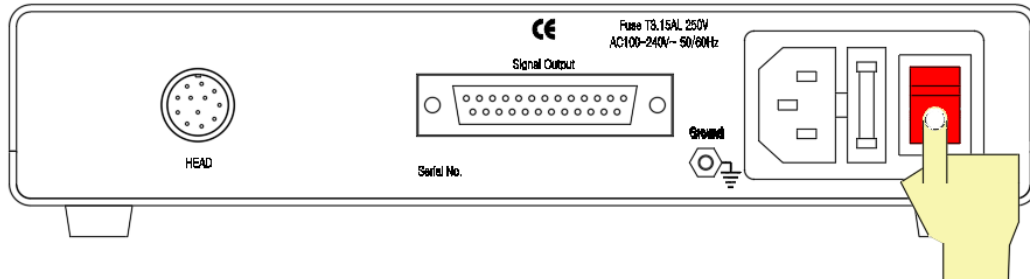
- ① Fix the device using the holes on the fixture bracket and the screws supplied, at a desired location.

✗ Please install the head in a shielded equipment.

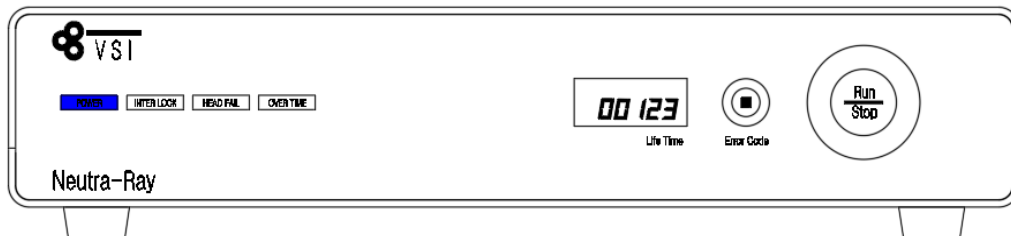
- ② Install the head in a shielded location, the controller at a place with easy access, and connect the power and ground cables.
- ③ Connect the Head and the controller using the connection cable provided.

■ **How to Use the Controller (Applicable to both VSC-104Z & VSC-104Z-S)**

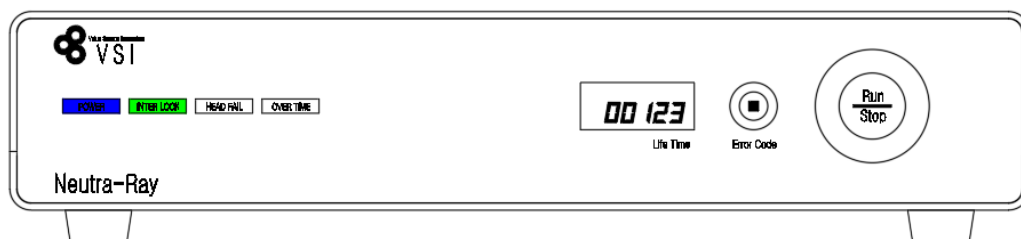
- ① Connect the controller and the head before turning on the power switch.
- ② Turn on the switch on the rear panel of the Controller (Red light will be lighted on the Switch).



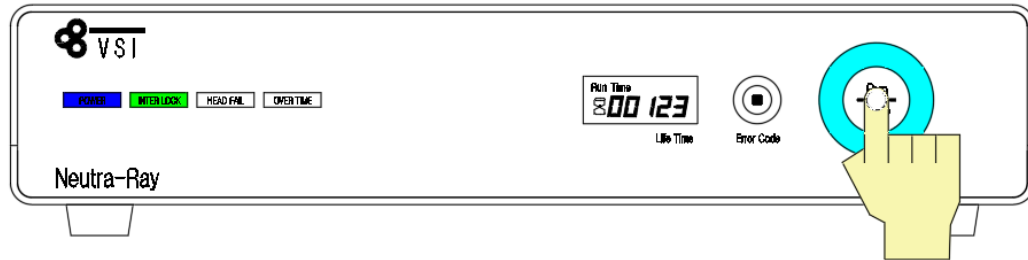
- ③ If the power is normally applied, the front power lamp will be turned on.



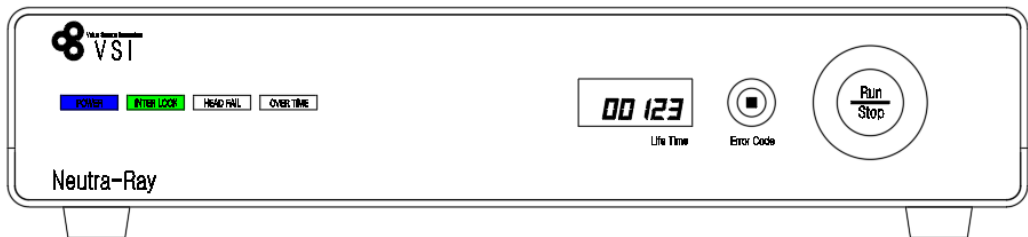
- ④ **[Interlock Input]** By closing the DSUB I/O Connector pin 24 and 25 with contact input on the rear panel of the controller, soft X-ray is ready to be irradiated. Check the interlock lamp status on the front panel of the controller (For the safety instructions, please refer to "1 Interlock Input Signal" on Page 11).



- ⑤ **[Ionizer Irradiation ON]** Push Run/Stop button on the front panel of the controller once (For the Remote Ionizer Irradiation ON method, please refer to “2) Remote Signal Input Contents” on Page 11). During regular irradiation, the area around Run/Stop button will be lighted with white light, and LCD will display hourglass symbol.



- ⑥ **[Ionizer Irradiation OFF]** Push Run/Stop button on the front panel of the controller once (For the Remote Ionizer Irradiation OFF method, please refer to “2) Remote Signal Input Contents” on Page 11). When the device turns off normally, the area around Run/Stop button will be turned off and the hourglass symbol will disappear.



■ **Controller Operation Status when Head OverTime Occurs**

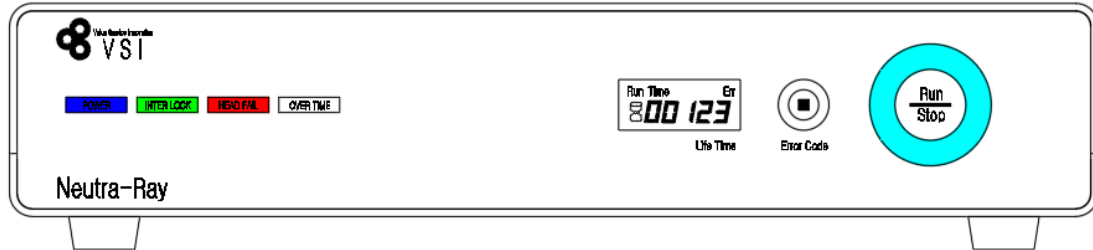
When the life of the head has passed, the controller OverTime lamp is lit, and LCD will display “OverTime”.



■ **Controller Operation Status when Head FAIL Occurs**

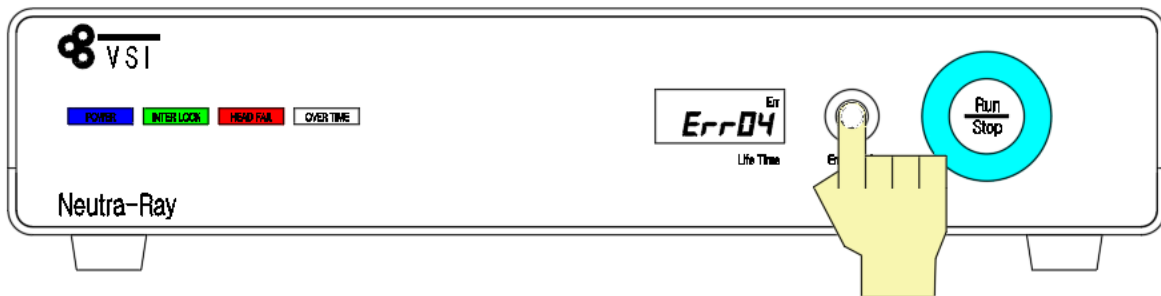
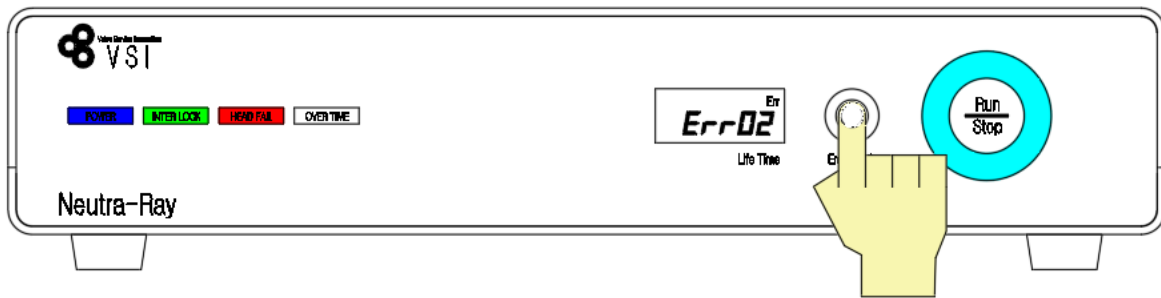
Due to the abnormal operation of the head, the head red light will be lighted, and the Head Fail red light will be illuminated on the controller.

The LCD will display “Err” test additionally.



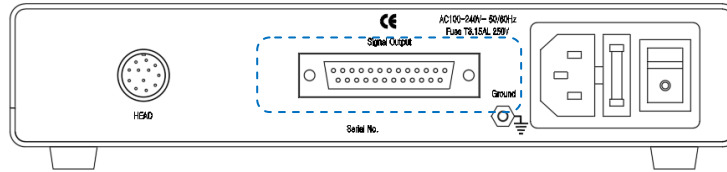
■ **Method to Check Error Information**

When an error occurs at the head, checking the error information using Error Code Switch is possible.



- Error Code 2 : A communication error between the head and the controller
- Error Code 4 : Problem with the operation of the head itself

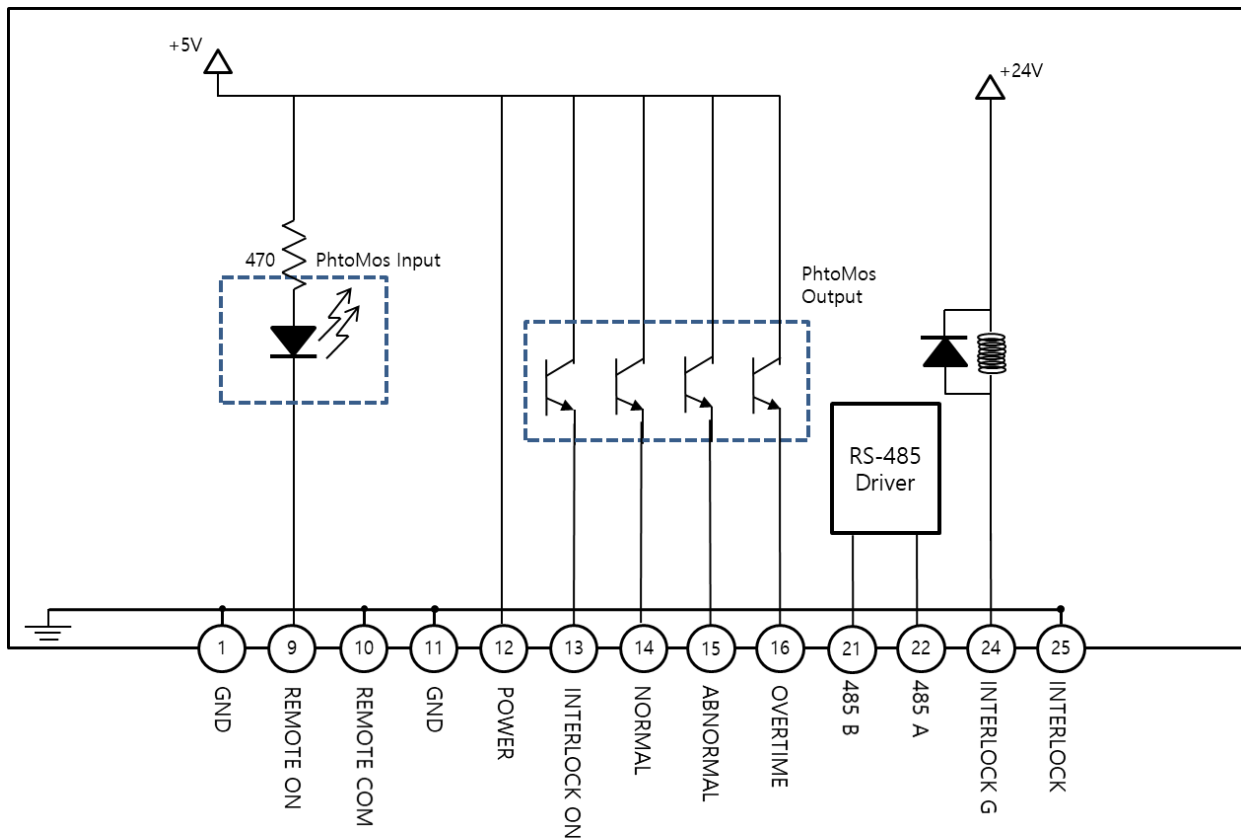
■ Controller Rear Panel Signal Input / Output Connections



DSUB 25Pin Female

Pin number	Pin name	Description
1	GND	Controller ground
2	Unused	-
3	Unused	-
4	Unused	-
5	Unused	-
6	Unused	-
7	Unused	-
8	Unused	-
9	REMOTE ON	Remote input
10	REMOTE COM	Remote input COM
11	GND	Controller ground
12	POWER	Output 5V when the power is on
13	INTELOCK ON	Output 5V when the interlock 24 and 25 are closed
14	NORMAL	Output 5V when ionizer irradiation is on
15	ABNORMAL	Output 5V when the head fail occurs
16	OVERTIME	Output 5V when the head overtime occurs
17	Unused	-
18	Unused	-
19	Unused	-
20	Unused	-
21	485 B	RS-485 Communication purpose (Contact VSI for the protocol)
22	485 A	RS-485 Communication purpose (Contact VSI for the protocol)
23	Unused	-
24	INTERLOCK G	Interlock input COM
25	INTERLOCK	Interlock input

■ Signal Input / Output Internal Circuit



- ※ Terminal 12, 13, 14, 15 and 16 on the output side do not have internal protection resistors. Therefore, operation of LED, photocoupler and TTL semiconductor must be executed upon confirming the operating current and installing protection resistors. (Maximum of 20mA is allowed at each terminal.)
- ※ If power is supplied, the internal components of terminal 9 and 24 on the input side can be damaged.

1) Interlock Input Signal

- Interlock ON

When the interlock contact connected to D-SUB 24 & 25 are closed, it is ready to irradiate soft X-ray. The Interlock on the front panel of the controller will be lighted.

- Interlock off

When the interlock contact connected to D-SUB 24 & 25 are opened, Run/Stop switch and the remote do not work. The interlock on the front panel of the controller will be turned off.

※ **Warning:** If humans are exposed directly to soft X-ray, it could cause damages. Therefore, the interlock must be connected. If the enclosure door is opened during the irradiation of soft X-ray, the interlock terminal will open, and the irradiation of soft X-ray will automatically stop. If the enclosure door is closed, the interlock will close, and the device will be in the ready status.

- Safety Features

If the interlock door becomes “open” status during the irradiation of soft X-ray (“Run/Stop” button is lit on the front panel of the controller), the irradiation will stop.

“Interlock” lamp and “Run/Stop” switch are turned off on the front panel of the controller.

If the interlock is closed (safe status), the device will return to the safe mode and can start irradiation of soft X-ray by inputting the Remote On signal into the controller.

2) Remote Input Signal

Remotely control the photo ionizer by inputting the control signal from the external (equipment side) to the D-Sub 25pin connector.

- Remote On

When D-Sub15pin terminal 9 and 10 are closed, irradiate the ionizer.

- Remote OFF

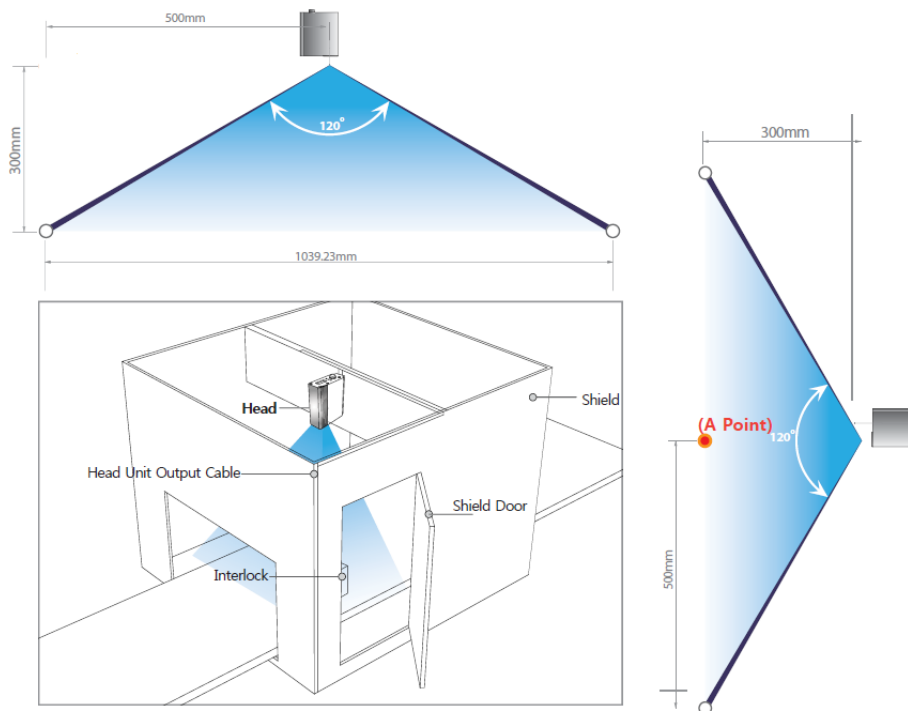
When D-Sub15pin switch 9 and 10 are opened, stop irradiation of the ionizer

3. Safety Instructions

Head that emits soft X-ray during operation must be shielded for users' safety. Since the shielding rate differs depending on the material, please refer to the following materials to design the shield.

- Point A : Shielding 10cm from the front of the X-ray window

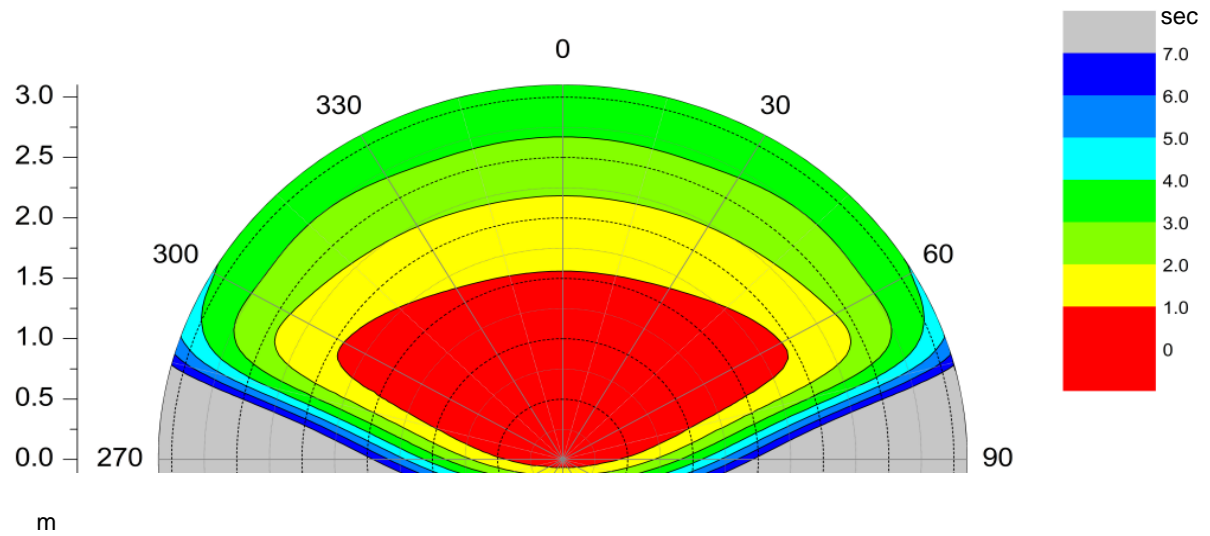
Shielding Material	Thickness [mm]
Stainless steel	0.5
Aluminum	9
glass	17
PVC	14
Acrylic	148



- The above shield thickness design is only suitable when the shield is 10cm away from the source of the X-ray. If the distance is shorter, the thickness must be increased.
- After shielding, the leaked radiation level must be lower than the legal limit (10 μ Sv/h).

4. Decay Time

Static electricity removal performance is represented by the time taken to drop the metal plate charged at $\pm 1000\text{V}$ to $\pm 100\text{V}$ by irradiating soft X-ray.



※ Decay Time (when mounted): Top ->Down Irradiation, Based on straight line distance.

5. Product Specifications

HEAD	
Dimensions	100 x 77x 134 mm
X-Ray tube	Tube voltage 15.0kV, Tube
Electron emission	CNT type
Weight	1.1kg
LED indicator	Run / Over Time / Alarm

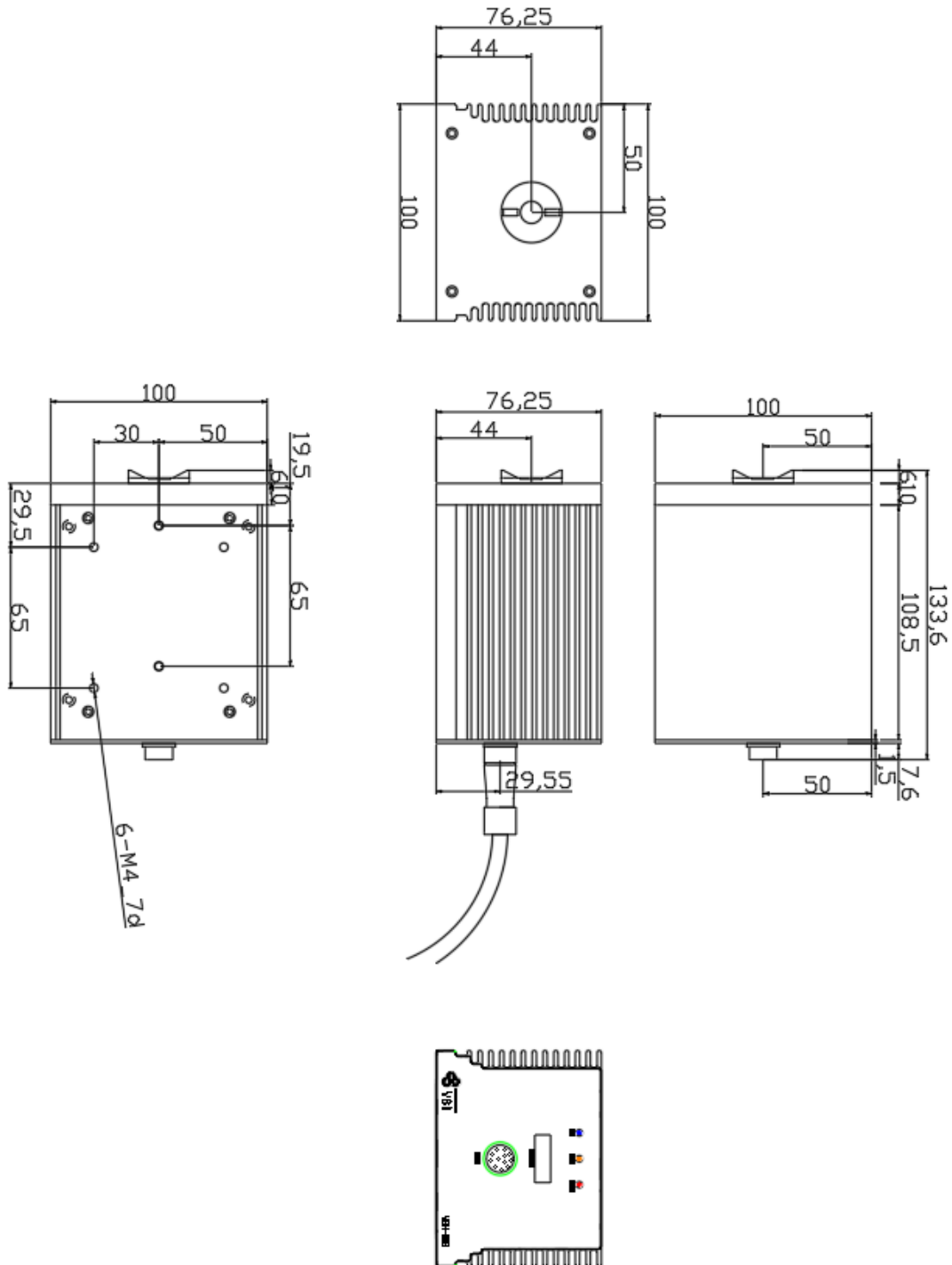
Controller	
Dimensions	215x42x136 mm
Weight	0.65kg
Power consumption	45W
Operating temperature	0 ~ 40°C (32 ~ 122°F), 35 ~ 85% RH
LED indicator	Power/ Interlock / Head Fail / Remote mode state
Functions	Interlock On/Off, Remote On/Off Power on state, Interlock on state, Run state, HEAD fail state

6. Components Included

Controller (VSC-15G)	Controller/ 1ea
Head (VSH-15G)	HEAD/ 1ea
Output Cable / 20m / 1ea	Fixing Bolt / M4 x 0.7pitch x 10L / 8ea
Power Cable / 1.8m / 1ea	Signal Cable / 25Pin D-Sub 5m / 1ea

7. External Dimensions

■ Head



■ Controller

