INSTRUCTION MANUAL

ELIMINOSTAT CABX series

Shishido electrostatic,LTD. Rev1.00

Thank you very much for your purchase of CABX series. Although this Product is not classified as a high-voltage device under any electrical equipment standard, it uses a high voltage. Please read this manual diligently to carefully and correctly handle this unit. Keep this manual on hand for your reference and consult it repeatedly as required

Safety Precautions

There is a possibility of leading to the breakdown of the accident resulting in injury or death and the product because this product uses a high voltage in the main body when improper use. Our company shall not be held liable for any usage outside the Product Specifications or any accident caused by noncompliance with the Safety Precaution.

Please appropriately install in semiconductor-fabrication equipment and other production lines, etc. and use it. An appropriate place is a place in which a suitable cover exists in the place where the temperature and humidity, etc. were managed.



This Product is not specified as an Explosion-proof Type. Do not use this unit at a location or an atmosphere, in which combustible gas or solvent is handled, or else ignition or explosion may occur.

A high voltage is applied to the Discharge Needle. Do not allow any conductive material, including your finger, any part of your body, wire or any tool to get close to the Needle, or an electrical shock accident or a malfunction of the Unit may occur.

The Discharge Needle has a sharp edge. Pay special attention to handling of the Needle, or you may injure yourself.

Never disassemble, repair, or remodel this unit, or else an accident or a malfunction of the Unit may occur

When any wiring, installation, or inspection work is to be carried out, make sure that the Unit is disconnected from the power supply, or else an accident, an electrical shock or a malfunction may be caused



This Product contains a high-voltage generating device inside the Unit. Do not install the Unit at a location where it may be exposed to splashing of water or oil, high temperatures, or excessive humidity. Make sure the Unit is protected from condensation

Make sure that the ground terminal of this Product is properly grounded to prevent any electric shock accident from occurring and to ensure that the static electricity is completely eliminated.

Make sure that any unserviceable unit or any unnecessary unit should be properly disposed of as an industrial waste material.

Be sure to connect the wiring correctly. Failure to do so may result in malfunction.

Do not use with intermittent air. If you need to use intermittent air, please contact

This product generates a high voltage. Please do the installation, the operation, and the maintenance of this product if you have enough knowledge and the experience

1.Product Overview

This Product is an air bar ionizer (static electricity eliminating device) gused to neutralize electrostatic buildup in locations where it is a frequent problem. Itcontains an ionized air emitter, and can be set up easily by supplying DC 24V from the provided cable, or by using AC100-240V(with the optional AC adapter). It must be grounded to work correctly. The ionized air it generates quickly and efficiently. It also includes functions to detect operating trouble ensuring that it can be used safely and reliably. It also includes functions to detect operating troubles and to provide the cleaning timer that counts electrified time, ensuring that it can be used safely and reliably.

2.System Configuration

To use this product ,apply DC24V to the supplied power/signal cable.

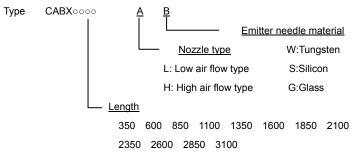
If DC 24V power is unavailable ,use the optional AC adapter. An optional extension cable is available if the power/signal cable or AC adapter cable is too short to reach the installation location.

3. Specifications

Ion generation method		Corona discharge		
Structure		Capacitive-couple type		
Applied voltage		±10kV 0-p		
Ion balance		±30V or less *1		
Effective 6	elimination distance	50mm~1500mm *2		
Rating	Power voltage	DC24V±5%		
*3	Power consumption	150mA or less		
		1650 or less Outer diameterφ6		
Air tube connection diameter		1850 or over Outer diameterφ8 (Use nylon ,soft nylon, or polyurethane tube)		
Air su	ipply pressure	0.05∼0.5MPa		
	Body	ABS		
Material	Emitter electrode	Stainless steel		
	Emitter needle	Tungsten Silicon Glass		
Service	Temperature	5~40℃		
environment	Humidity	15 \sim 85%(No condensation)		
environment		Altitude up to 2000m		
Installation location		Only the indoor use		

- *1: At the time of shipment from the factory, the product is set for a measurement distance of 300mm and air pressure of 0.3MPa
- *2: Elimination effect is due to the distance between the ionizer and the object, so please fix it with careful consideration.
- *3:Use the LPS(Limited Power Source) certified with IEC/EN60950-1.

CABX has six discharge nozzle types of combination according to the amount of air consumption and its material. Use proper type due to your usage.



- *Emitter nozzle's kinds can be changed in the future.
- *Silicon and Glass emitter is production on orders.

4.Package Contents

When this Product has been delivered to your site, check the package for any missing part or for any abnormality or damages that may have occurred during delivery before using the Unit. In case any damage should be found or any abnormal operation should be observed, please contact the shop where you purchased the Product (the agency), or the nearest service station of our company

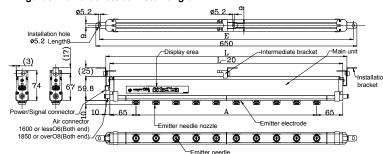
- ① Main unit : 1 unit
- Operation manual : This document
- Installation brackets : 2 units (with 2 installation screws)
- (4) Power/signal cable: 1 unit (length 3M)
- Intermediate brackets: listed in the table below

(Installed on product at the time of shipment)

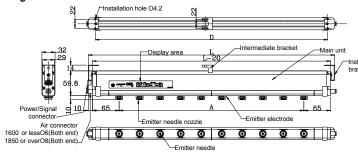
Length	350 600 850	1100 1350	1600 1850	2100 2350	2600 2850 3100
Qty.	0	1	2	3	4

5.Appearance and Names/Functions of Parts

Figures with brackets to install angle

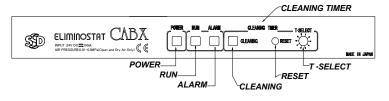


Figures with brackets to fix in vertical direction



Emitter needle					
Length	L(mm)	A(mm)	Weight(kg)		
350	350	50p x 4=200	0.5		
600	600	50p x 9 =450	0.7		
850	850	50p x 14 =700	0.9		
1100	1100	50p x 19 =950	1.1		
1350	1350	50p x 24 =1200	1.3		
1600	1600	50p x 29 =1450	1.5		
1850	1850	50p x 34 =1700	1.7		
2100	2100	50p x 39 =1950	1.9		
2350	2350	50p x 44 =2200	2.1		
2600	2600	50p x 49 =2450	2.3		
2850	2850	50p x 54 =2700	2.5		
3100	3100	50p x 59 =2950	2.7		

Display area



Indication		Explanation		
POWER		This green LED illuminates when the power is		
POV	VER	ON and normal.		
RUN		This green LED illuminates when the system is		
		operating normally.		
		This red LED illuminates when a		
		plus-discharge is occurring at the emitter		
ALA	ARM	needle or other high-voltage part of the unit,		
		and when over-current has occurred in the unit		
		circuits.		
		When running time passed the accumulative		
	CLEANING	running time that was set up by T-SELECT, the		
CLEANING TIMER		yellow LED turn on.		
	RESET	Button that resets illumination of CEANING		
		LED.		
	T · SELECT	Selector that set up the accumulative running		
		time to illuminates CLEANING LED.		
O locate lietie or ened colores				

6.Installation and wiring

6.1Configuration

This product has CLEANING TIMER function that enables you to inform proper time for cleaning. By setting up the accumulative running time, when it reaches the time, CLEANING LED illuminates. If you use this function, please set up the configuration of T-SELECT to optional number with a cabinet screwdriver

- * Its number is set up to No.0 when shipping
- * With this function, running time is added up by every one hour, so within one hour, this function does not work.
- * When CLEANING LED illuminates, that does not indicates ALARM. Please note that when CLEANING LED illuminates, this product does
- T-SELECT No
- * As amount of attached substances to discharge needles differs by atmosphere and air flow, please set up the cleaning period with your considering those elements.

T · SELECT Configuration

not work as ALARM mode

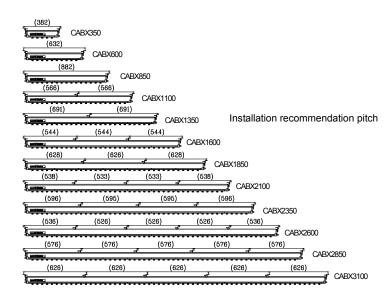
T · SELECT No	Accumulative running time (h)			
0	This function will not work. (Default setting when shipping)			
1	100			
2	300			
3	500			
4	800			
5	1000			
6	3000			
7	5000			
8	8000			
9	10000			

6 2Installation

Before Installation

*Install so that the main unit does not contact any grounded object. Such contact may result in unit malfunction. In particular, if the emitter electrode contacts the ground, a safety circuit operation failure may occur.

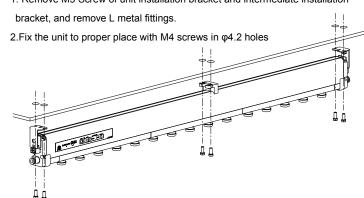
*Be sure to fasten the brackets securely. Failure to do so may cause the unit (particularly longer units) to bend or twist, resulting in malfunction.



- *Install the unit onto a frame or similar structure of adequate strength. If the strength is insufficient, the unit may become unstable and fall or may cause bending of the body
- *Be sure to check the installation location and other conditions before installing the unit. In particular, if there are problems such as vibration or level differences at the installation location, bending of the unit may occur, resulting in malfunction.
- *Be sure to turn the power OFF before installing the unit. High voltage is applied to the emitter needle. If fingers, tools, jewelry, or other conductive objects are brought close to the needle, electrical shock or, malfunction may
- *Before installing the unit, verify that there is no looseness of the emitter needle nozzle. If the nozzle is loose, it may fall off during installation or during operation when the power is turned ON.
- *If there are any structural objects between the unit installation position and target for electrostatic elimination, the ions in the emitted air may be depleted, preventing the full electrostatic elimination effects from being achieved. Select a unit installation position so that no objects can interfere with the operation. Please be careful not to omit some structural objects moving nearby, when installing
- *The distance of the ground point from the target for electrostatic elimination is 50mm-1500mm. The electrostatic elimination effects are optimum at a distance of 50mm. As the distance increases, the effects decrease and a longer amount of time may be required for electrostatic elimination. Please confirm the elimination effect beforehand.

Installation method when using vertical-direction-installation bracket.

1. Remove M5 Screw of unit installation bracket and intermediate installation bracket, and remove L metal fittings.



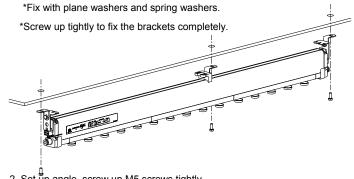
- *Fix the unit to proper place with M4 tapping, or with nuts from the backside.
- *Fix with plane washers and spring washers.
- *Use two nuts per one bracket
- *Distance between nut hole for installation and the body is narrow, we

recommend you to use bolt nuts with hexagonal holes and fix with a ball-point-type wrench.

Installation method when using angle-installation brackets

1. Please fix to the hole of ϕ 5.2 of the bracket with the M5 screw in the place where it wants to installation bracket and intermediate bracket

*Fix the body to proper place with M5 tapping, or with nuts from the backside.

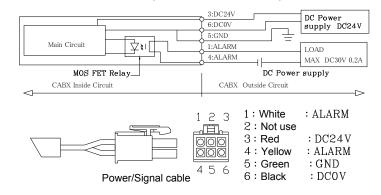


2. Set up angle, screw up M5 screws tightly

*If tightening of M5 screws is lose, the installed angle may be changed, and may make elimination effect lower.

6.3Wiring and Tubing

Connect the provided power/signal cable as shown in the figure below.



- *Securely connect the ground wire to the ground. (type a or type b).
- *Use the LPS(Limited Power Source) certified with IEC/EN60950-1.
- *Securely insert the connector.
- *The alarm wire insulation is not pre-stripped, when using the wire, strip away an appropriate amount of the insulation. The wire diameter is 22 AWG.
- *The alarm signal is a maximum of DC20V 0.2A

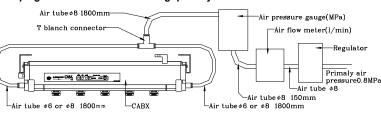
Status	Power OFF	RUN LED ON	ALARM LED ON
Contact signal	Open	Close	Open

*The optional AC adapter does not come with an alarm wire connected. When using the AC adapter, verify the connector number, and then securely insert this wire into the connector in order to use it.

Connect a Φ 6 air tube (nylon, soft nylon, or polyurethane) to both sides of the unit.

- *There are air connection ports on both sides of the unit. However, if sufficient air can be supplied from just one side, it is possible to supply air from one side for this product to work efficiently. In this case, be sure to use a plug for the Φ6 (or Φ8) air connection port on the unused side.
- *The compressed air supplied must be clean, dry air. If an air filter is necessary for the air supply equipment you are using, use an in-line filter system or similar item
- *The maximum air pressure that can be supplied to the unit is 0.5MPa. Because this unit does not include a regulator speed controller or similar function, an air pressure regulator must be provided by the user.
- *As the amount of compressed air consumed varies depending on the unit length of your model, the air pressure level, the diameter and the length of piping, use devices that are suitable for the conditions of use

Piping of measurement of flowing quantity of air



Air flow with L-type (low air consumption type) nozzle

*This data is experimental

0.1 11	0.2	0.3	0.4	0.5
11			0.7	0.5
	15	17	19	21
23	28	32	37	40
34	41	48	54	59
43	43	62	71	77
51	62	75	85	96
58	74	87	100	113
80	103	121	138	154
93	117	139	159	175
104	132	153	175	194
113	143	168	191	212
122	157	183	208	229
131	168	195	222	246
	34 43 51 58 80 93 104 113	34 41 43 43 51 62 58 74 80 103 93 117 104 132 113 143 122 157	34 41 48 43 43 62 51 62 75 58 74 87 80 103 121 93 117 139 104 132 153 113 143 168 122 157 183	34 41 48 54 43 43 62 71 51 62 75 85 58 74 87 100 80 103 121 138 93 117 139 159 104 132 153 175 113 143 168 191 122 157 183 208

Air fllow(I/min)

H-type (high speed type)nozzle

*This data is experimental

3, 3, p. (g., open 3, p.)					
Length	Air pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5
350	23	28	31	35	39
600	42	52	59	67	73
850	58	71	83	94	105
1100	68	88	101	117	133
1350	75	98	116	132	149
1600	80	105	125	145	162
1850	138	171	192	225	256
2100	159	191	215	252	283
2350	163	200	235	277	308
2600	174	211	250	295	332
2850	178	218	260	306	349
3100	185	223	268	315	363
A: (II / // :)					

Air fllow(I/min)

7. Operating the Product

Setup before Starting Operation

Check the ionizer wiring and air tubing.

Supply air to the unit from the air equipment that is used

*Use air pressure off 0.5MPa or less

Supply DC24V power to the unit. The POWER LED and RUN LED on the unit illuminate and electrostatic elimination starts.

*If the optional power adapter is used, supply AC100-240V, 50/60Hz

Steps when Stopping Operation

Stop supplying of power to the unit.

Stop supplying of air.

Canceling the Alarm

*Because this device utilizes high voltage, if a safety or operating problem is detected, the high voltage is shut off. At this time the RUN LED turns OFF and the ALARM LED illuminates. The system is configured so that the system cannot be restarted unit the alarm has been reset.

*When the ALARM LED is illuminated, refer to "9. Troubleshooting" in this manual and correct the problem before restarting operation.

Stop supplying of power to the unit.

Remove problems referring "9.Trouble shooting" in this manual.

Start supplying of power to the unit again.

Cancelling operation of CLEANING

Push the CLEANING TIMER RESET button more over 2 seconds while RUN status Timer will be reset

Maintenance

*This device should be installed and used in a location where it will not contact water, oil, or similar substances. However if water, oil, or another substance contacts the product, immediately turn OFF the power and wipe away the substance with a cloth or other item. Use particular caution at the high voltage sections and surrounding area

*If the emitter needle and surrounding area become fouled, the electrostatic elimination effects will be reduced. If the electrostatic elimination effects diminish, clean the emitter needle and the surrounding area periodically (in particular, the emitter needle nozzle.) for preventing drop of elimination effect. Be sure to turn the power OFF beforehand.

Cleaning the Emitter Needle nozzle

*Be sure to turn the power OFF before cleaning the emitter needle nozzle. Failure to do so may result in electric shock or malfunction of this unit.

*The emitter needle nozzle is removable. When dust or other substances become noticeable at the location where the product is used, remove the emitter needle nozzle and take it to another location for cleaning

*The tip of the emitter needle is extremely sharp. Use sufficient care when handling it. The needle tip can cause injury.

*If the emitter needle tip accidentally becomes bent or chipped, or resin part of discharge needle is damaged during cleaning, replace the emitter needle nozzle. If the emitter needle nozzle is not replaced, the full product performance will not be achieved or it may cause some accidents.

1. Verify that the power is turned OFF (disconnected).

2. Verify that the supply of air is stopped.

*To perform cleaning without removing the emitter needle nozzle, proceed to ④

3. Twist the emitter needle nozzle counterclockwise in order to remove it from the

*It is possible that the O-ring may become stuck to the unit when the emitter needle nozzle is removed. If this occurs, remove the O-ring, taking care not to lose or damage it. If the O-ring is not reinstalled after cleaning, it will cause air leakage, preventing full performance from being achieved.

4.Use cotton swabs or a similar thing moistened with alcohol to wipe away the fouling from inside the emitter nozzle, the emitter needle area, and other areas

*If only performing cleaning without removing the emitter needle nozzle, then cleaning is now finished. Verify that the tip of the emitter needle is not bent or chipped, and that resin part of discharge needle is damaged.

*Be sure to allow the alcohol to fully evaporate (dry) after cleaning.

*When you clean discharge needles taken off from the body, do not clean needles soaked in alcohol. If you do so, it may cause residual of alcohol inside discharge needles and because of its structure, it cannot be easily dried, so it may lead to damage of the body when you apply high voltage

5. Securely reinstall the emitter needle nozzle by placing it in its original position and turning it clockwise until it stops

*When reinstalling the emitter needle nozzle, be sure to verify that the O-ring is correctly positioned on the nozzle before installing

5.Verify that the tip of the emitter needle nozzle is not bent or chipped, and that resin part of discharge needle is damaged, and that the emitter needle unit is securely installed.

Replacing the Emitter Needle Nozzle

*Because the emitter needle nozzle is consumable part, it eventually becomes necessary to replace it. In addition, the emitter needle or the emitter needle nozzle may become bent or chipped during maintenance or due to accidents. If the tip of the emitter needle becomes worn through use or damaged, it may become impossible to achieve this product's full performance. In this case, replace with a new emitter needle. (Refer to "Optional Parts.")

- 1. Verify that the power is turned OFF (disconnected).
- 2. Verify that the supply of air is stopped.
- 3. Twist the old emitter needle nozzle counterclockwise in order to remove it from the unit
- *It is possible that the O-ring may become stuck to the unit when the emitter needle nozzle is removed. If this occurs, remove the O-ring carefully.
- 4.Securely install the new emitter needle nozzle by placing it in the position and turning it clockwise until it stops.
- *When installing the new emitter needle nozzle, be sure to verify that the O-ring is in the designated location on the nozzle before installing.
- 5. Verify that the tip of the emitter needle is not bent or chipped, and that resin part of discharge needle is damaged, and that the emitter needle unit is securely installed.

9.Troubleshooting

- *The POWER LED does not illuminate.
- →Verify that the wiring and power source are connected correctly.
- *The POWER LED illuminates, but the RUN LED does not illuminate.
- →Verify that the ground wire is securely connected to the ground.
- →Check whether the ALARM LED is illuminated.
- *The ALARM LED is illuminated.
- →Check whether the emitter needle or surrounding area has become fouled.
- →Verify that no grounded objects are in contact with the unit.
- →Verify that there is no looseness in the screws at the part that connects the emitter counter electrode.
- →Verify that the unit securely grounded.
- $\rightarrow\!\mbox{Verify}$ that the emitter needle nozzle is not loose.
- →Please confirm if some generation sources of electromagnetic noise are not around the product.

10. Optional Parts

Low consumption air nozzle (Tungsten) : OCABX-NDL-LW Low consumption air nozzle (Silicon) : OCABX-NDL-LS Low consumption air nozzle (Glass) : OCABX-NDL-LG High speed air nozzle (Tungsten) : OCABX-NDL-HW : OCABX-NDL-HS High speed air nozzle (Silicon) High speed air nozzle (Glass) : OCABX-NDL-HG Intermediate bracket : OCABX-SUSP-A AC adapter : OCABX-DA Extension Cable : OCABX-ENC3M

SHISHIDO ELECTROSTATIC,LTD. http://www.shishido-esd.co.jp/

Overseas Department, Tokyo Branch

Shishido Bldg ,1-3-3 Higashi-Yukigaya, Ota-ku, Tokyo 145-0065 ssd-export@shishido-esd.co.jp

Tel +81-3-3727-0161 Fax +81-3-3727-0342

Head Office

9F-918, Marunouchi Bldg, 2-4-1 Marunouchi, Chiyoda-ku Tokyo 100-6309