

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.

Warning

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.

Caution

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 us beforehand.

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) used to neutralize electrostatic buildup in locations where it is a frequent problem. It contains 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 elimination distance		50mm~1500mm *2
Rating *3	Power voltage	DC24V±5%
	Power consumption	150mA or less
Air tube connection diameter		1650 or less: Outer diameterφ6 1850 or over (Outer diameter φ8) (Use nylon ,soft nylon, or polyurethane tube)
Air supply pressure		0.05~0.5MPa
Material	Body	ABS
	Emitter electrode	Stainless steel
	Emitter needle	Tungsten Silicon Glass
Service environment	Temperature	5~40℃
	Humidity	15~85%(No condensation) 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 **43.5 psi @ 11.81"**

*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.

Type	CABX○○○○	A	B	Emitter needle material					
		Nozzle type		W:Tungsten					
		L: Low air flow type	H: High air flow type	S:Silicon					
				G:Glass					
		Length							
		350	600	850	1100	1350	1600	1850	2100
		2350	2600	2850	3100				

*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.

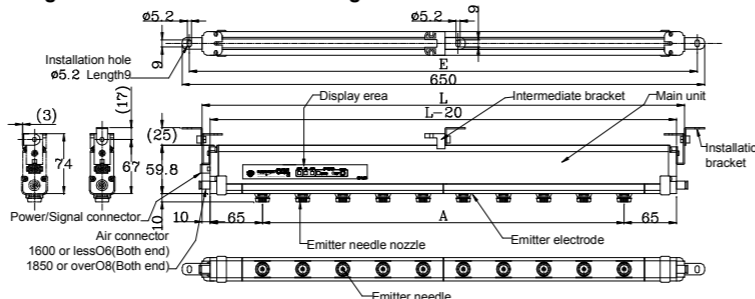
- ① Main unit : 1 unit
- ② Operation manual : This document
- ③ Installation brackets : 2 units (with 2 installation screws)
- ④ Power/signal cable : 1 unit (length 3M)
- ⑤ Intermediate brackets : listed in the table below

(Installed on product at the time of shipment)

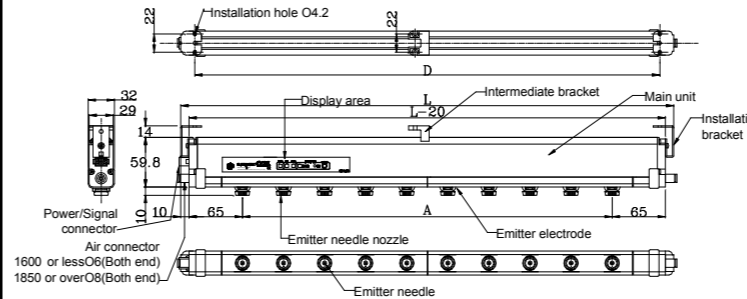
Length	350/600/850	1100/1350	1600/1850	2100/2350	2600/2850/3100
Qty.	0	1	2	3	4

5. Appearance and Names/Functions of Parts

Figures with brackets to install angle

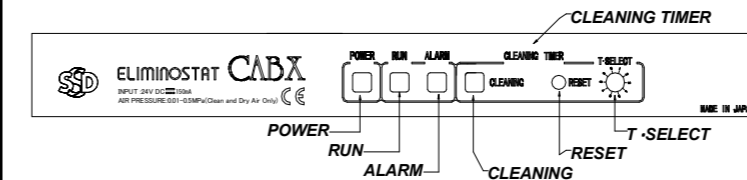


Figures with brackets to fix in vertical direction



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



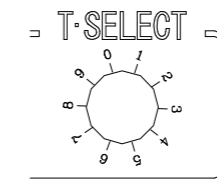
Indication	Explanation
POWER	This green LED illuminates when the power is ON and normal.
RUN	This green LED illuminates when the system is operating normally.
ALARM	This red LED illuminates when a plus-discharge is occurring at the emitter needle or other high-voltage part of the unit, and when over-current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

6. Installation and wiring

6.1 Configuration

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 T·SELECT No CLEANING LED illuminates, this product does not work as ALARM mode
- * 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

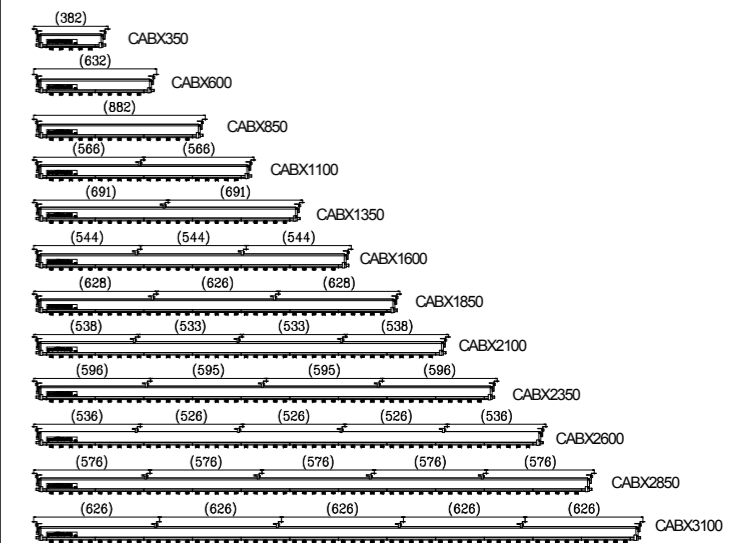
T · SELECT No	Accumulative running time (h)
0	This function will not work. (Default setting when shipping)
1	100
2	300
3	500
4	800
5	1000
6	3000
7	5000
8	8000
9	10000

6.2 Installation

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.



Installation recommendation pitch

*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 occur.

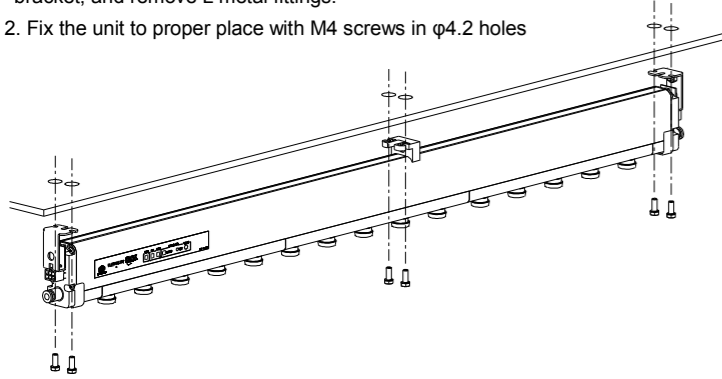
*Before installing the unit, verify that there is no looseness of the emitter needle nozzle. If the nozzle is loose, it may fall off during installation or during operation when the power is turned ON.

*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.
2. Fix the unit to proper place with M4 screws in $\phi 4.2$ holes



*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.

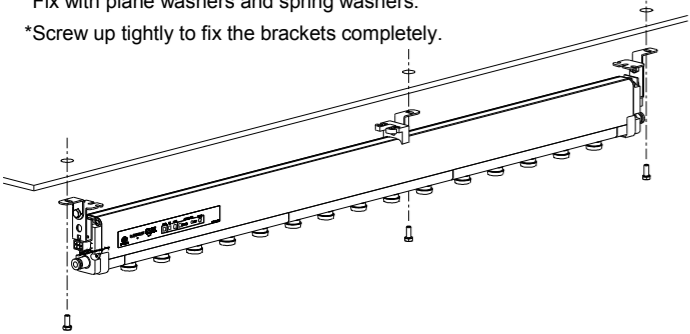
Installation method when using angle-installation brackets

1. Please fix to the hole of $\phi 5.2$ 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.

*Fix with plane washers and spring washers.

*Screw up tightly to fix the brackets completely.

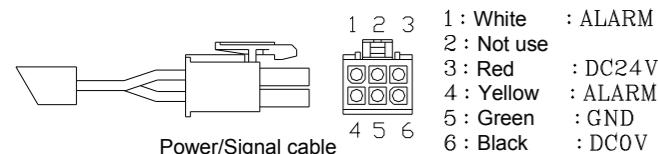
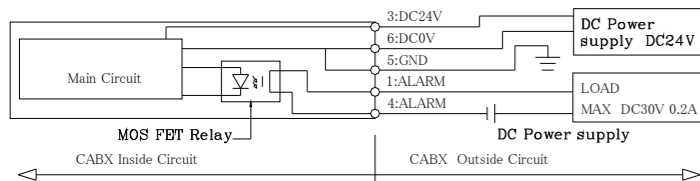


2. Set up angle, screw up M5 screws tightly.

*If tightening of M5 screws is loose, 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 $\phi 6$ 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 $\phi 6$ (or $\phi 8$) air connection port on the unused side.

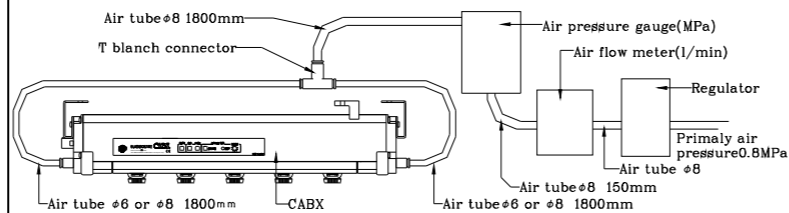
*The compressed air supplied must be clean, dry air. If an air filter is necessary for the air supply equipment you are using, use an in-line filter system or similar item.

72.5 psi (max)

*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

Length	Air pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5
350	11	15	17	19	21
600	23	28	32	37	40
850	34	41	48	54	59
1100	43	43	62	71	77
1350	51	62	75	85	96
1600	58	74	87	100	113
1850	80	103	121	138	154
2100	93	117	139	159	175
2350	104	132	153	175	194
2600	113	143	168	191	212
2850	122	157	183	208	229
3100	131	168	195	222	246

Air flow (l/min)

H-type (high speed type) nozzle

*This data is experimental

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

Air flow(l/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 until 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.

Canceling 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 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, 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 that are dirty.

*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 again.

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.

→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
High speed air nozzle (Silicon)	: OCABX-NDL-HS
High speed air nozzle (Glass)	: OCABX-NDL-HG
Intermediate bracket	: OCABX-SUSP-A
AC adapter	: OCAB-DA2
Extension Cable	: OCABX-ENC3M

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