ANEST IWATA

REGISTERED FIRM
ISO 9001
JISQ 9001

JAB
QMS Accreditation
RD05

Instruction manual

■ Electrostatic Controller

E-SC12

E-spray Series

This instruction manual contains **IMPORTANT WARNINGS, CAUTIONS** and instructions for safe operation. Before operation, be sure to read this instruction manual thoroughly and understand the equipment so that you can use it safely and effectively for a long time.

Keep this booklet in an appropriate place for immediate reference.

■ Important information －Safety Precautions

This Electrostatic Controller is exclusively used for electrostatic air hand guns（E-spray series）. Be sure to read and understand this instruction manual. The operator shall be fully conversant with the requirements stated within this instruction manual including important warnings, cautions and operation. Wrong operation (mishandling) can cause serious bodily injury, death, fire or explosion.

Keep this booklet in an appropriate place for immediate reference.

This system is used along with related electrostatic air hand gun（E-spray series）, and paint pump（e.g. DPS-90D）, etc. When using related equipment, also read instruction manuals for those products.

➢ About safety

Pay special attention to items which are shown by below marks and symbols. Symbols and marks have the following meanings.

Indication of warnings and cautions

WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in serious injury or loss of life.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

Examples of warnings and cautions

	Indicates [You must be careful]. We will explain briefly in or near the symbol. (The example on the left is [Be careful about electric shock]).
	Indicates [You must not do]. We will explain briefly in or near the symbol. (The example on the left is [Do not touch]).
	Indicates [You must do]. We will explain briefly in or near the symbol. (The example on the left is [Be sure to ground it]).

✓ **We shall not be responsible for any injury or damage caused by disregard of warnings, cautions or instructions.**

Important	Indicates notes which we ask you to observe. They are helpful to fully achieve performance and functions of the equipment.

■ Warnings and cautions for safe operation

⚠ WARNING

Fire and Explosion

Avoidance of fire and explosion at painting site

❶Never install it at a site with flammable goods or bring flammable goods like lighters. Paints and organic solvents are flammable, able to cause fire.

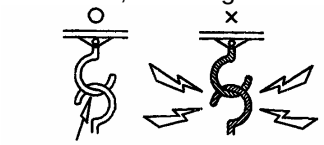
❷Never use the following Halogenated Hydrocarbon solvents which can chemically react with gun handle (aluminum) etc., crack and melt them.

- **Improper solvents:** methyl chloride, dichloromethane, 1,2-dichloroethane, carbon tetrachloride, trichloroethylene, 1.1.1.-trichloroethane

※Be sure that all fluids and solvents are compatible with gun parts. We are ready to supply a material list used in the gun on request.）

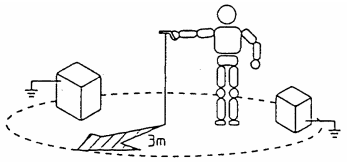
Avoidance of fire caused by grounding failure

❶ Be sure to keep hanger or conveyor clean without paint stuck on it and keep them conductive. Incomplete grounding, dirty hanger or conveyor cannot conduct electricity, and static electricity accumulates, resulting in fire accident by spark discharge.

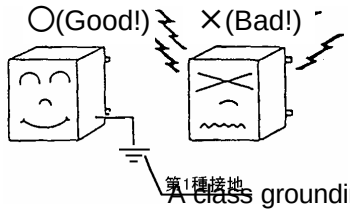


Be sure to contact metallic points by making contact points knife-edged or sharp-pointed.

❷ Store paint and solvent in a metallic container which is grounded. Poorly grounded conductor can accumulate static electricity, causing fire accident by spark discharge. If you are forced to place conductive goods such as fluid container and fluid supply pump within 3m from the gun, be sure to ground them without fail.



❸ Securely ground electrostatic controller （A class grounding：less than 10Ω）. As you ground the electrostatic gun by contacting electrostatic controller through low voltage cable, incomplete grounding can accumulate static electricity on electrostatic gun, causing fire accident by spark discharge or bodily injury by electric shock.



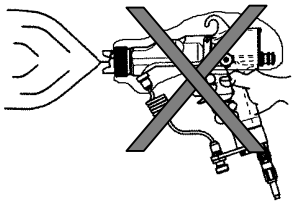
Avoidance of fire by ignition of paints and solvents

❶ Be sure to turn off electric source of electrostatic controller before cleaning inside of fluid passages. As paints and solvents are flammable and have low flash points, they can catch fire if there is spark discharge in and around painting site.

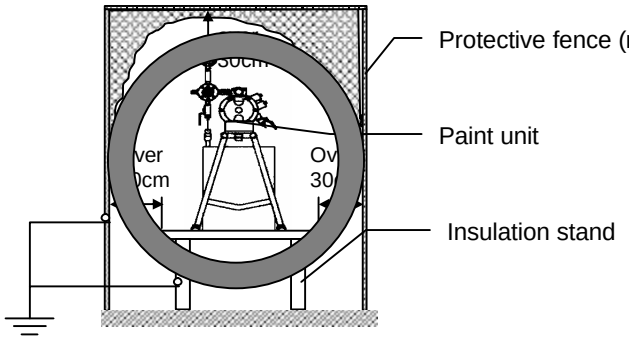
❷ Spray distance between workpiece and painting equipment must be over 10cm. If the distance is less than 10cm, spark discharge can occur and paint can catch fire.

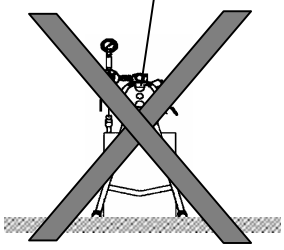
❸ Never use lacquer paints. Lacquer paints have low flash points and can catch fire.

❹ Do not cover electrostatic gun with anti-dust sheet. Static electricity accumulated on sheet can discharge and solvent gas can catch fire.



❺ When painting low resistance paints and metallic paints with electric leak with electrostatic gun E-M10B series, insulate paints, fluid hose and paint supply unit and install protective fence around paint supply unit(Regarding protective fence, observe instructions「Protection from high voltage❶」) on P.⑤ If they are not insulated, paints and solvents can catch fire by discharge between grounded metals. (Refer to connecting example on page 8 regarding how to insulate).





❻ When painting low resistance paints and metallic paints with electric leak with electrostatic gun E-M10B series and refilling paint into paint supply unit during painting, be sure to turn off electric source of electrostatic controller. If you try to refill paint when high voltage is charged, paint can catch fire.

❼ When painting low resistance paints and metallic paints with electrostatic gun E-M10B series and using more than 2 guns at the same site, separate individual paint supply unit. If you try to use 2 guns with one set of paint supply unit and charge one gun only, the other gun, which is not charged, can be charged through paint. Then, paint and solvent can catch fire.

Wrong operation

Avoidance of wrong use

❶Never point toward human or animal during spraying. If done, it can cause inflammation of eye or skin and bodily injury.
❷Never use gas other than compressed air. If done, it can cause fire or poisoning accident.
❸Never use at higher than max. operating pressure (refer to specifications on page 2).

Avoidance of wrong operation

❶Before inspecting, cleaning, disassembling or assembling electrostatic gun, be sure to turn off electric source of electrostatic controller interlocked equipment and equipment and fully release air and fluid pressure in the following procedure. If not, it can cause bodily injury by wrong operation.

Job 1) Turn off electric source of electrostatic controller .

Job 2) Stop supply of compressed air, paint and solvent to spray equipment.

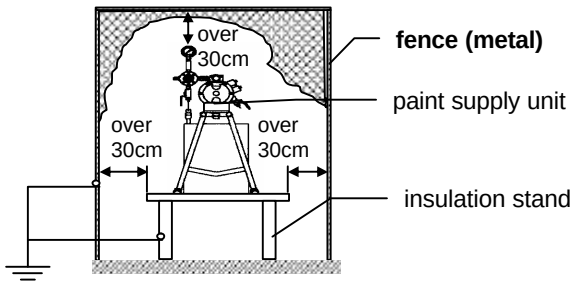
Job 3) Turn electrostatic gun downwards, pull trigger, operate fluid needle and fully release air pressure and fluid pressure.

Bodily protection

Protection from high voltage

❶ When insulating paint, fluid hose and paint supply unit (electrostatic gun: E-M10B series + insulation stand), be sure to install protective fence (metal) around them so that people cannot come closer to 30cm from them.

Be sure to ground protective fence. If not, it can cause bodily injury by electrostatic accident or electric shock since high voltage is charging paint supply unit on insulation stand.



❷ When insulating and using paint, fluid hose and paint supply unit (electrostatic gun : E-M10B series + insulation stand) and touching electrostatic gun, paint supply unit or metal in painting site in order to clean and inspect painting equipment, be sure to turn off electric source of electrostatic controller and operate while ground wire or ground bar (grounded metallic bar) comes into contact with painting equipment.

If not, electric shock can cause bodily accident if charging is not turned off or ground is not connected, since high voltage is used.

◎operating order

① Turn off charging of electrostatic controller and electric source.
② In 10 seconds, make ground wire or ground bar contact with metal which operator touches during operation.
③ Operate while ground wire or ground bar comes into contact with metal.

Protection from solvents, air and fluid pressure

❶Use spray booth and do the painting job in a well-ventilated place. Painting and cleaning jobs in a poorly ventilated site can cause organic solvent poisoning and ignition.

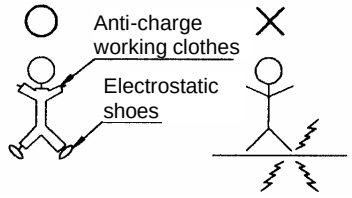
❷ Always wear protective tool such as protective goggles and mask. If not, cleaning liquid can touch eyes and skin, causing inflammation. If you feel something wrong with eyes or skin, immediately consult with a doctor.

❸We recommend you to wear earplugs for your safety. Noise level can reach over 85dB (A) depending on operating and working conditions.

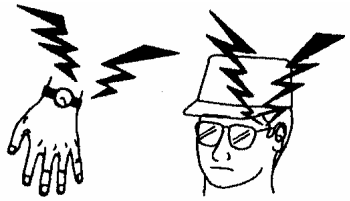
❹Be sure to turn off electric source of electrostatic controller and release fluid and air pressure before cleaning, disassembling or doing maintenance job or during stoppage of job. If not, remaining pressure can cause bodily injury through wrong operation and spattering of cleaning liquid. Be sure to follow [Avoidance of wrong operation] on page ④ in order to turn off electric source, and release air and fluid pressure.

Protection from static electricity

❶ Be sure to wear electrostatic shoes (resistance figure $10^5 \sim 10^8\ \Omega$、JIS T 8103) and anti-charge working clothes (JIS T 8118). If not, static electricity can accumulate on human body and cause bodily accidents by electric shock.



❷ Operators must not wear metallic things such as watch or key holders during operation. If done, static electricity can accumulate on them and you will get an electric shock.
If you wear glasses with metallic frame and approach the gun, you can get an electric shock.
Before approaching spray equipment, turn off electric source of electrostatic controller.



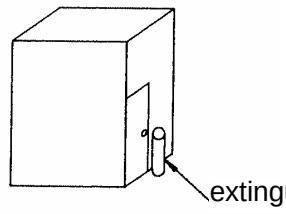
❸ Operator must always hold electrostatic gun with bare hand or glove having a large hole at palm position. As human body is grounded through the handle of electrostatic gun, static electricity can accumulate on human body and cause bodily harm by electric shock if operator holds the gun handle with normal glove.

❹ When you turn off main electric source switch in order to stop the gun operation in an emergency, it takes about 5 seconds till the electric potential of electrostatic gun goes down to a safe level. Don't try to touch the pin electrode at tip of gun during that period.

Others

❶Never use altered parts or other than genuine parts when parts are damaged or worn out. If done, it can cause failure of the gun, accidents or bodily injury.

❷Be sure to install a fire extinguisher at painting site.



❸Make sure that the equipment has stopped before you enter the working range of other painting equipment (robot, reciprocator, etc.). If not, moving robot or reciprocator can injure you.

❹Never use for food or chemicals. If done, erosion in paint passages can cause accidents, and foreign matter can enter.

❺When paint becomes dry, do not use conductive paints. If done, static electricity can leak. Contact paint manufacturer for details.

❻Be sure to use air hose and fluid hose we have designated.
General fluid hose and rubber hose can leak static electricity and damage isolation.

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1. Specifications

Specifications

Items	Contents
Input voltage	E-SC12/-S0:AC100～120 50/60Hz single-phase (when shipped) (AC200～240 50/60Hz single-phase by setup change, refer to 9.3 about setup change) E-SC12-S2: AC200～240 50/60Hz single-phase (when shipped)
Output voltage (Electrostatic Controller)	MAX DC12V
Output current (discharge current of electrostatic spray gun)	MAX 100μA
Electric consumption	About 30W
Safeguards	Detection of ground failure, overcurrent, disconnection of shielded wire, spray set time failure, 2-gun charging (when multi guns are in use)
Dimensions L×W×H	220mm×160mm×130mm
Mass	About 3.1kg
Charge ON/OFF mechanism	Air flow switch (air joint IN/OUT size: G1/4 male)
Max. operating air pressure (when air flow switch is used)	MAX 0.68MPa (100 psi)
Applicable electrostatic spray gun	E-spray series electrostatic spray gun (e.g. Hand gun type E-M10B, E-M15B, ESGX-121C Auto gun type E-A10, E-A15)

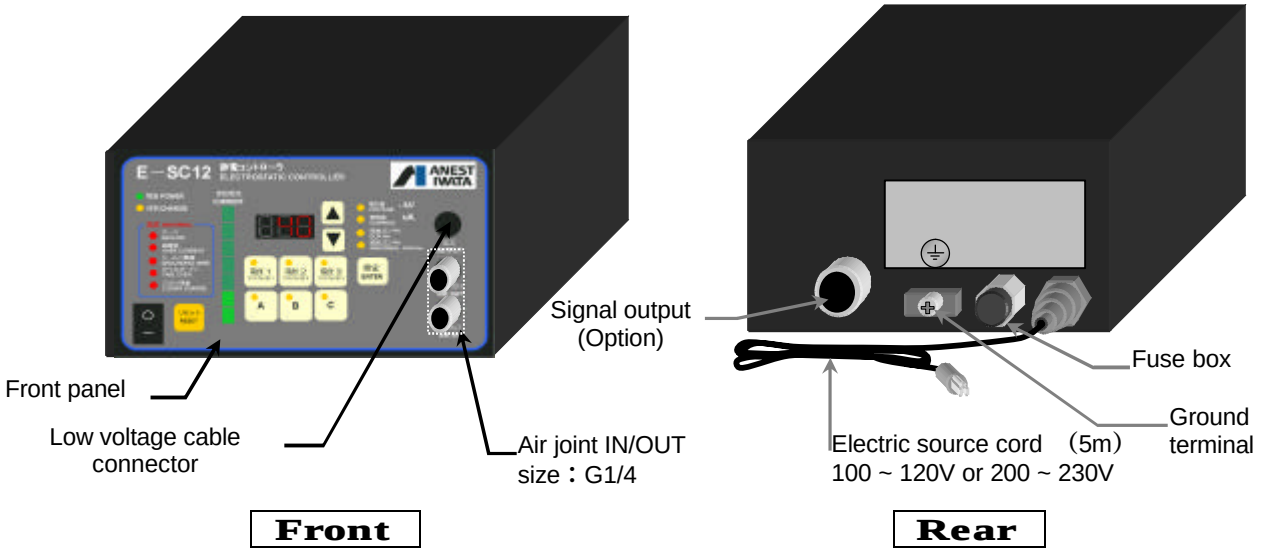
2. Check the products

This unit consists of the following accessories including electrostatic controller. Before use, be sure to check that all the products are included without any damage. If you find some products are missing or damaged, contact the shop which sold it to you.

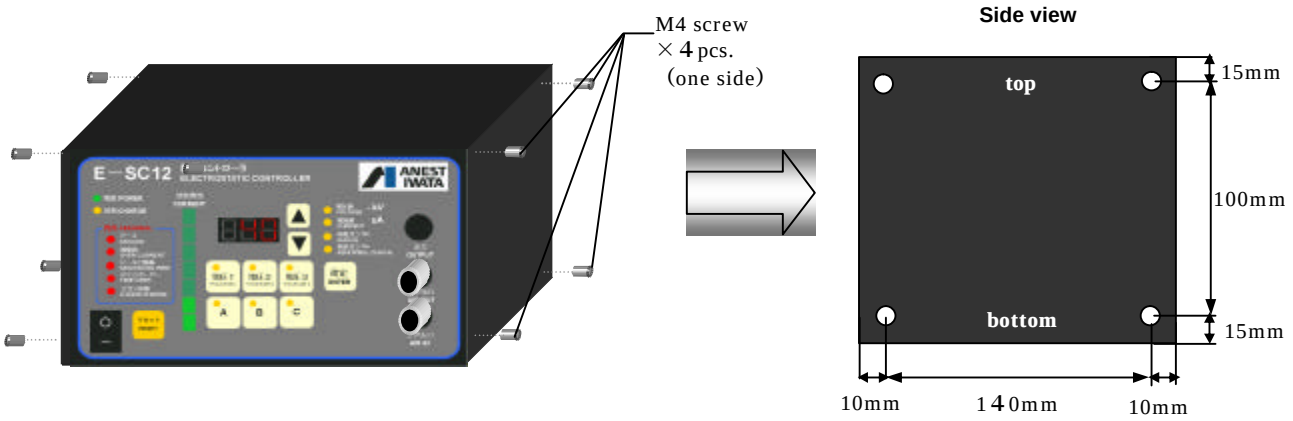
<table>
<tr><th colspan="2">Name of products</th><th colspan="6">Contents</th></tr>
<tr><td colspan="2">Electrostatic Controller</td><td colspan="6">  </td></tr>
<tr><td rowspan="4">Accessories</td><td>(1) Grounding wire (5m)</td><td colspan="6"> 
R1.25-4 R1.25-6</td></tr>
<tr><td>(2) Instruction manual (this one)</td><td colspan="6">  </td></tr>
<tr><td rowspan="3">(3) Mounting stays</td><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Mounting stay</td><td>M4(8mm) Screw</td><td>Hex. bolt</td><td>Hex. nut</td><td>Spring washer</td><td>Plain washer</td></tr>
<tr><td>2 pcs.</td><td>4 pcs.</td><td>4 pcs.</td><td>4 pcs.</td><td>4 pcs.</td><td>8 pcs.</td></tr>
</table>

3. Names and functions of each section

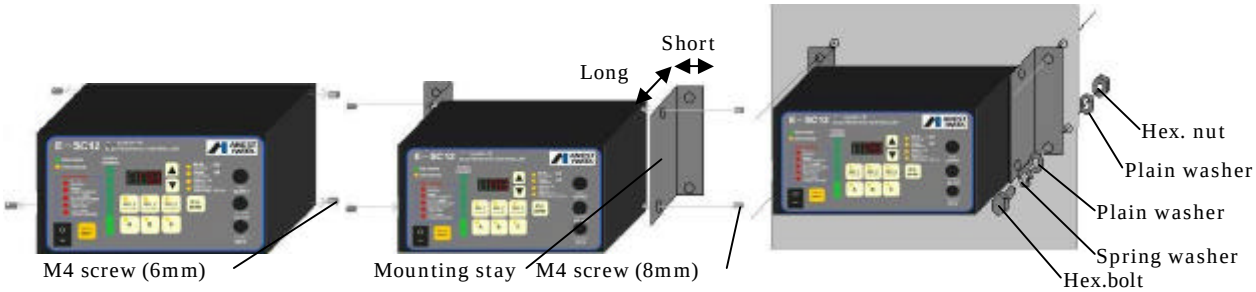
3.1 Outer appearance of electrostatic controller



3.2 Position of screw (M4) to fix electrostatic controller



If you want to mount electrostatic controller on the wall, please use mounting stays of accessories.



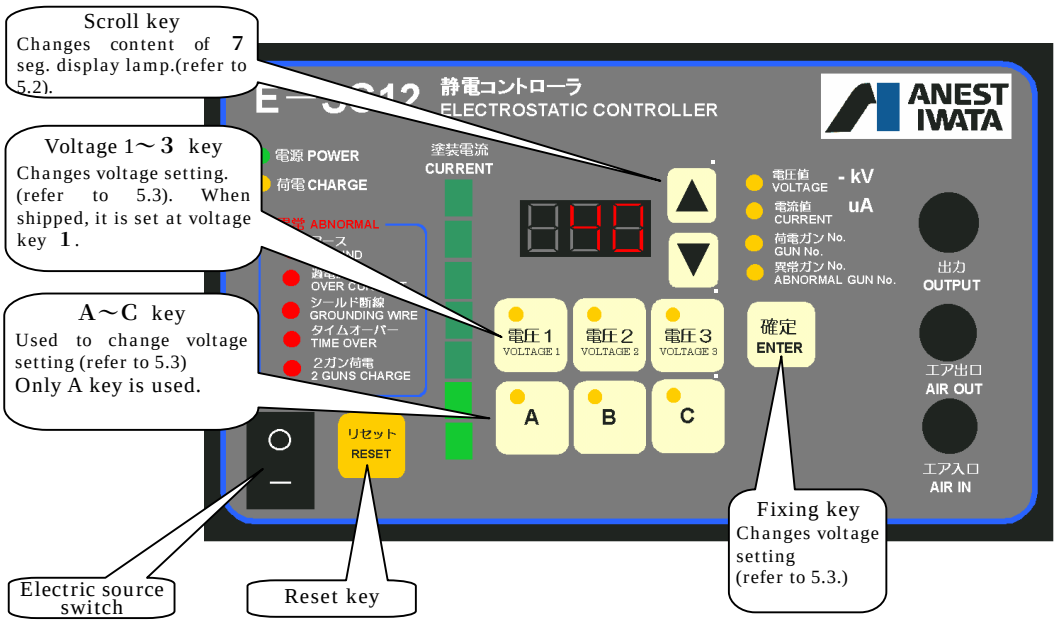
(1) Replace 4 M4 (6mm) screws on back side.

(2) Fix 2 mounting stays with 4 M4 (8mm)

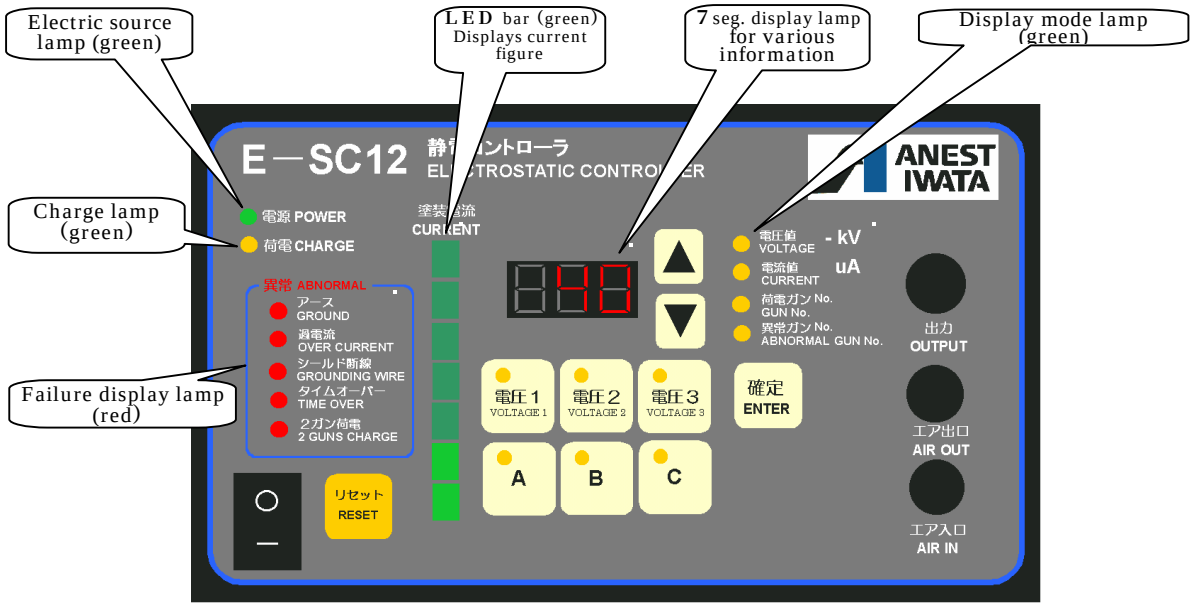
(3) Make holes for M6 Hex.bolt, then mount electrostatic controller on the wall using bolt set of accessories.

3. 3. Front panel of electrostatic controller

1) Operation section



2) Display section



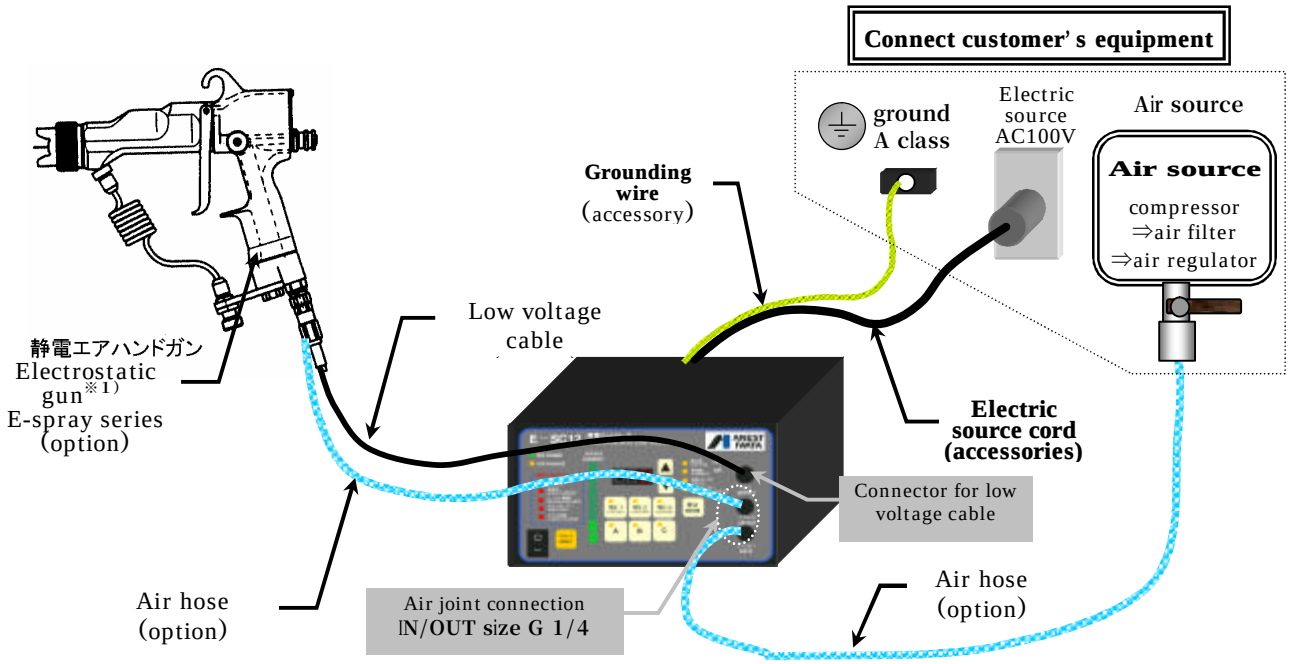
4. Setup of electrostatic controller

We explain how to set up electrostatic controller about standard connection as shown below.

Before setup, be sure to observe the below warning.

⚠ WARNING	
⚠	(1) Before connection, be sure to turn off electric source switch, release pressure of primary side air source and turn off all electric source switches of related equipment.
⏚	(1) Securely connect grounding. Insufficient grounding can cause failure by charging of electrostatic controller, fire by spark discharge through leak, charge, or injury by electric shock. (2) Be sure to connect surrounding metallic things to ground before charging electrically. If not, it can cause fire or injury by electric shock.
❗	(1) Never use primary side electric source other than designated AC100V. If you want to use AC200V, you need to change voltage setting (refer to 9. 3 change to 200V specifications). Input of different voltage than set specifications can cause damage to equipment or fire.

Standard setup

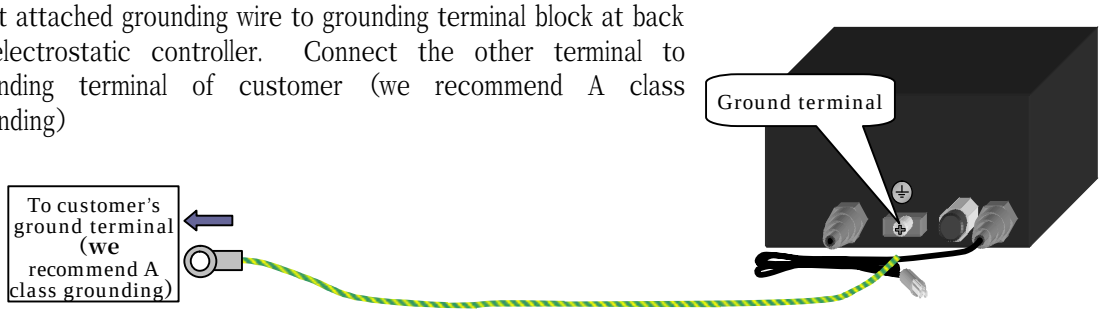


※1) In case of auto gun type, you do not need to connect electrostatic controller to air hose. But 4.3 connection of external charge signal becomes necessary.

4. 1 Connection of electric route

⚠ WARNING	
⚠	(1) Before connection, be sure to turn off electric source switch, release pressure of primary side air source and turn off all electric source switches of related equipment.
⏚	(1) Securely connect grounding. Insufficient grounding can cause failure by charging of electrostatic controller, fire by spark discharge through leak, charge, or injury by electric shock. (2) Securely connect grounding. Insufficient grounding can cause failure by charging of electrostatic controller, fire by spark discharge through leak, charge, or injury by electric shock.
❗	(1) Never use primary side electric source other than designated AC100V. If you want to use AC200V, you need to change voltage setting (refer to 9. 3 change to 200V specifications). Input of different voltage than set specifications can cause damage to equipment or fire.

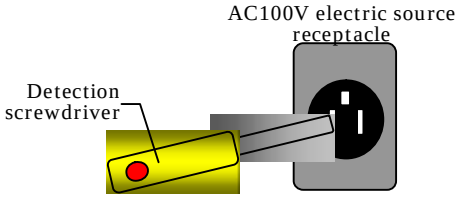
Job－1 Fit attached grounding wire to grounding terminal block at back of electrostatic controller. Connect the other terminal to grounding terminal of customer (we recommend A class grounding)



Job－2 Before connecting electric source cord, confirm that there is grounding phase (grounded electric source terminal) at one terminal of AC100V of customer's electric source. (Generally, commonly supplied AC100V in Japan has grounding phase. But when customer independently generates electricity or transforms electricity, there is no grounding phase in some cases) **If there is no grounding phase, grounding failure is detected even if you ground correctly.**

<How to check grounding phase of electric source>

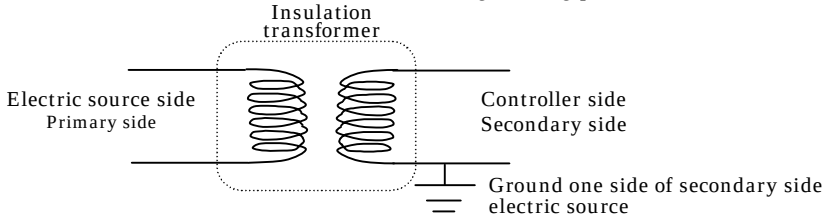
If both right and left lamps light up by detection screwdriver, the electric source has grounding phase and you can conntinue to Job－2. If both lamps do not light up and there is no grounding phase, **grounding failure is detected even if you ground correctly, cancel it by referring to next** ①～③.



<How to cancel when electric source has no grounding phase ①～③>

① Change to electric source equipped with grounding phase.

② Prepare insulation transformer, make electric source with grounding phase.



③ Cancel ground detection function and use it.

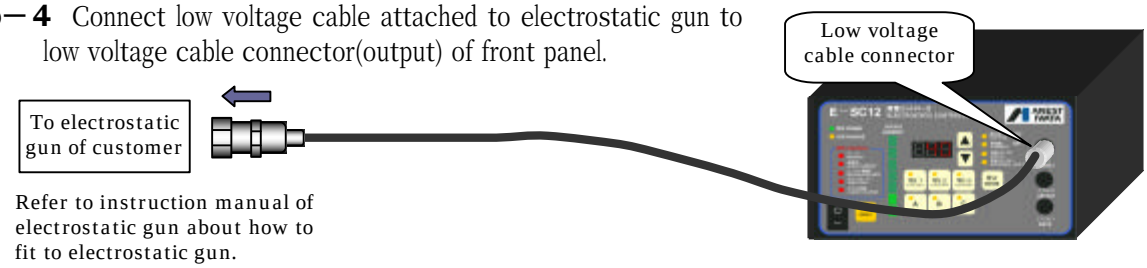
⇒*Ground detection becomes unavailable but be sure to ground as per* ***Job－1.***

Refer to 9. 2 cancellation of grounding connection failure detection.

※Refer to 9. 3 setup change to 200V specifications about setup change to 200V specifications.

Job－3 Insert electric source cord (with AC100V 2P receptacle plug) into AC100V electric source receptacle of customer.

Job－4 Connect low voltage cable attached to electrostatic gun to low voltage cable connector(output) of front panel.

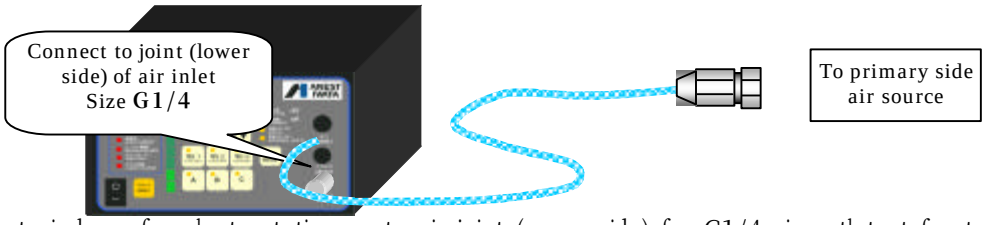


4. 2 Connection of air route (only hand gun type[E-M15/10 series])

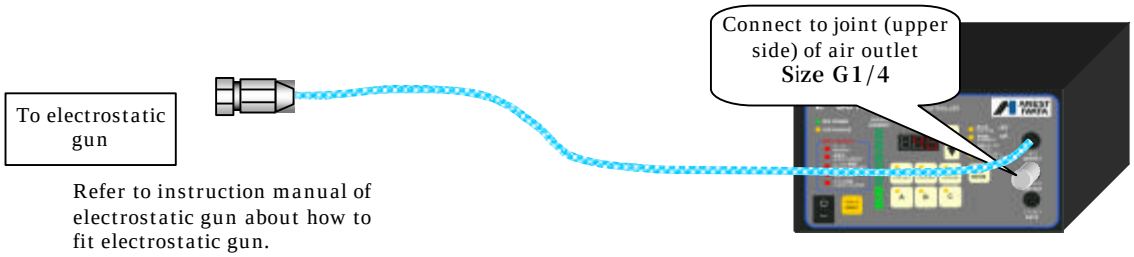
As hand gun type is charged ON/Off by air flow switch (air flow sensor) in electrostatic controller, you must connect air hose to electrostatic controller.

⚠ CAUTION	
❗	(1) When connecting air hose, pay attention so that dust does not enter air hose. If not, it can fail painting. (2) Use clean and dry compressed air which is filtered near at inlet to controller through air filter (less than 5μm) and dried through air dryer. Dirty air can fail painting.

Job－1 Connect air hose to joint(lower side) for G1/4 air inlet of front panel of electrostatic controller and the other side to air source of customer. As for customer's air source, be sure to read the above caution.



Job－2 Connect air hose for electrostatic gun to air joint (upper side) for G1/4 air outlet at front panel of electrostatic controller and the other side to air source of customers.



4. 3 Connection of external charge signal wire (only auto gun type[E-A10 series])

Auto gun can be charged ON/OFF from external charge signal. Refer to 9.4 external charge input signal about how to set up.

4. 4 Connection of external output signal

It can output signal of 「electric source」、「charge」 and 「failure」 to outside of electrostatic controller. Refer to 9.5 connection of external output signal about how to set up.

5. Operation

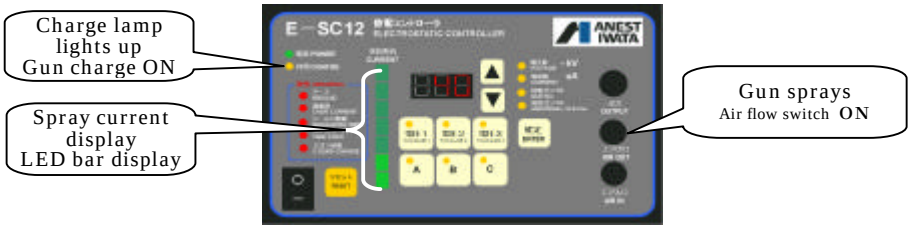
5. 1 Normal operation

⚠ WARNING	
⏚	(1) When charging electrically, be sure to ground all surrounding metallic things. If not, it can cause fire or injury of electric shock.
⚠ CAUTION	
⏚	(1) During charging (when high voltage is generated), do not put electrostatic gun within about 50cm of electrostatic controller. If done, electrostatic controller can fail if it sparks, as electrostatic controller is electrical equipment.

After setup of 4 is finished, start painting according to the following procedure.

Job − 1 Turn on electric source switch. Electric source lamp lights up and the gun is ready to charge (voltage key lamp, display mode lamp, 7 seg. display lamp lights up and displays.)

Job−2 In case of hand gun: if the gun starts to spray, air flow switch operates and gun is charged※1). In case of auto gun, if charge signal is ON (close), the gun is charged.

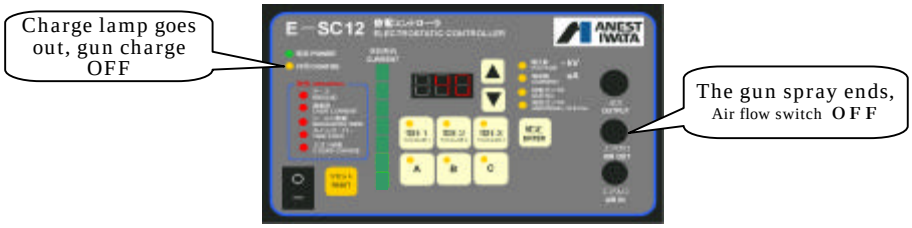


When high voltage is charged, charge lamp lights up and spray current figure is displayed in spray current figure※2) display LED bar.

※1) Max. voltage −40k is set when shipped from plant (set in voltage 1). Refer to 5.3 about how to change other voltage figure.

※2) It normally lights up about in the range of 0～30μA But display differs according to other conditions.

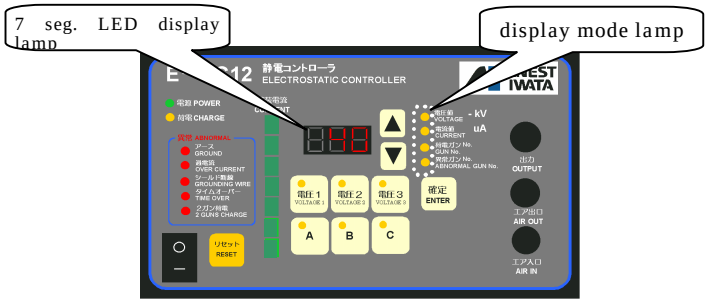
Job−3 In the case of hand gun: If the connected gun ends air spray, air flow switch stops, charge stops and returns to job-1 condition. As for auto gun, if charge signal is OFF (open), charge stops.



Job−4 If spray job is finished, turn off electric source of electrostatic controller.

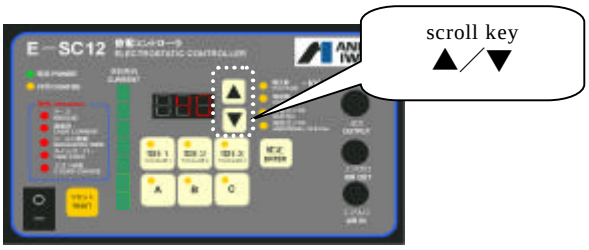
5. 2 How to change 7 seg. LED display items

Information of 「set voltage」、「spray current figure」、「charge gun No. 」※1) and 「failure gun No. 」※1) is displayed on 7 seg. display lamp. We explain how to change display items hereunder.



※1)E-SC12 does not display 「charge gun No. 」 or 「failure gun No. 」.

Job－1 Push scroll key (▲／▼)on the right side of 7 seg. display lamp and change to the item you want to display.



▲ :changes to upward mode.
▼ :changes to downward mode.

but if you select ▲ at top mode (voltage figure mode) , bottom mode (current figure mode) is selected.. If▼ is selected at bottom mode, top mode is selected.

Job－2 Lamp lights up in selected display mode and present figure of selected mode is displayed on 7 seg. display lamp.

Figure is displayed on 7 seg. display lamp in accordance with lit-up display mode lamp.

display item	unit on 7 seg. display lamp	displayed figure
voltage	－ｋＶ	set figure
current	μＡ	present figure

5. 3 How to change set voltage figure

Max. voltage－40kV (voltage 1 key) is set when shipped from our plant. When you want to change charge voltage of electrostatic gun, you can choose from the following 3 kinds of voltage. We explain how to change it.

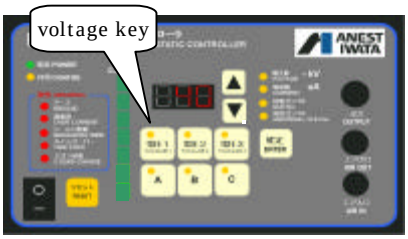
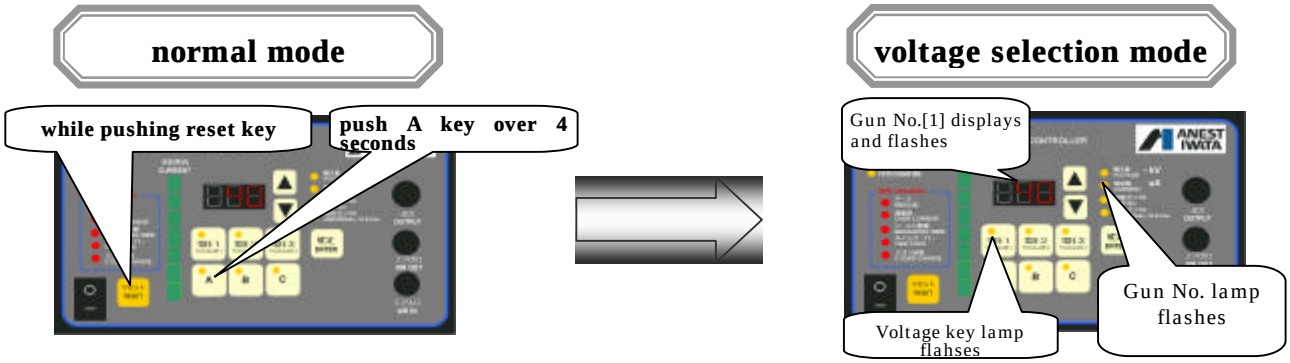


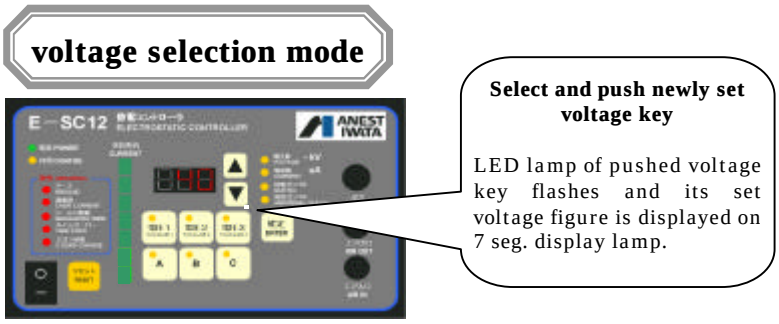
chart 1. Set voltage key against each voltage key

voltage	「voltage 1」 (standard)	「voltage 2」	「voltage 3」
set voltage	－40kV	－35kV	－30kV
		adjusts color of finishing surface, metallic paint or bounceback by voltage	

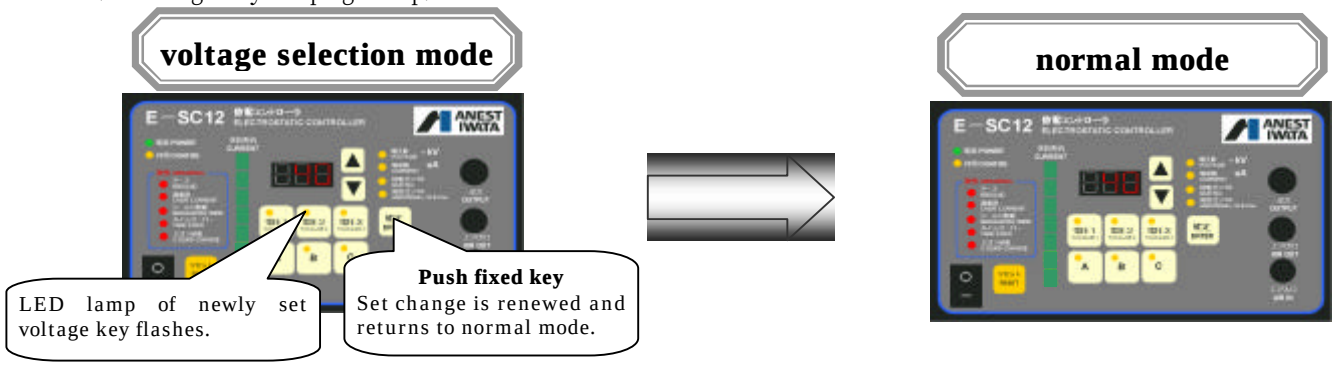
Job－1 If you continue pushing A key while pushing [reset key] under normal conditions (charge stand-by with only electric source ON for over 4 seconds, it becomes voltage selection mode. Voltage figure lamp of display mode lamp, gun No. lamp and voltage key lamp flash, and 7 seg. display lamp displays[1] and flashes.



Job－2 Choose newly set voltage key from 「voltage 1～3 key」 and push.
(Selected voltage key lamp flashes)



Job－3 If 「fixed key」 is pushed, voltage set mode returns to normal mode. Charge from next time is set figure by newly selected voltage key.
(Set voltage key lamp lights up)



6. Safeguards

Safeguards (failure detection functions) to monitor safety about electrostatic coating system of electrostatic controller are explained below.

6. 1 Safeguards to be monitored

■ Contents of safeguards

detection items	contents to be detected	safeguards
detects grounding disconnection	grounding disconnection of electrostatic controller itself	immediately shuts off charge and sounds failure buzzer. Warning mode is kept till reset key is pushed.
detects overcurrent failure (OCR)	when over 80μA coating current occurs.	immediately shuts off charge but can charge again if it is temporarily detected. But if it is intermittently or continuously detected, shuts off charge and sounds failure buzzer. Warning mode is kept till reset key is pushed.
detects shielded wire disconnection	when shielded wire of low voltage cable is cut	immediately shuts off charge and sounds failure buzzer. Warning mode is kept till reset key is pushed.
detection of spray set time	when detecting continuous charge signal for over 2 minutes	immediately shuts off charge and sounds failure buzzer. Warning mode is kept till reset key is pushed.
detects when over 2 guns are charged at the same time	E-SC12 does not detect this item.	

6. 2 Measures when warning mode appears by safeguards

When electrostatic controller detects failure, buzzer sounds and warning mode appears. Follow the following procedure, check the contents of failure and remedy.

Before taking any measures, be sure to read the following warning items.

Suppose that electrostatic controller detects failure, warning buzzer sounds and charge is stopped(= warning mode)

Job-1 Suspend coating job and check failure item by lit-up position of failure display lamp.

First check failure item by failure display lamp although warning buzzer continues sounding.

Job－2 If you have checked failure item, push reset key and cancel warning mode.
But if failure condition is continuously detected (for example, grounding failure is detected), warning mode cannot be cancelled since failure is detected again and warning mode appears. In that case, turn electric source switch OFF.

If failure item is checked, push reset key and reset warning mode. But as for ground failure, warning mode continues even if reset till grounding is reconnected.
⇒Turn electric source **OFF**.

Job－3 After cancelling warning mode, proceed confirmation about checked failure items according to below chart. When failure is still detected, equipment may have failed. Check again 8 Problems and remedies」.

⚠ WARNING	
⚠	(1) Before checking failure of electrostatic gun, be sure to turn off electric source of electrostatic controller and fully release air pressure and fluid pressure (refer to P.③ 「avoidance of wrong operation」) in order to avoid bodily injury by wrong operation.

Failure items	Check and remedy
detects grounding connection failure	Check if grounding is secured from grounding terminal at the back. When grounding failure is detected during input of electric source even if grounding is connected, electric source has no grounding phase.⇒refer to 4. 1－1 and check.
detects overcurrent (OCR)	Charge again and check if overcurrent failure is detected. When overcurrent failure is detected even if charged, check the following items. ✓ Check if spray distance is continuously short or other grounded thing comes nearer tip of gun. ⇒When spray distance is continuously short (grounded thing is near tip of electrostatic gun) this detection can work. If so, make spray distance longer. ✓ When using E-M15, check if electric resistance of paint becomes low. ⇒When electric resistance of paint is low, high voltage in this model (E-M15) can leak through paint passage. Change to paint and solvent to dilute with low resistance for electrostatic coating. ✓ When using E-M15, check if inside of fluid tube of electrostatic gun becomes dirty. ⇒When conductive ingredient is in paint, such ingredient(for instance, metallic) accumulates in electrostatic fluid hose and high voltage can leak from accumulated paint. In that case, clean inside of fluid tube of electrostatic gun. ✓ When using low resistance paint in E-M10 and E-A10, pull out needle valve set or piston set and check if fluid needle packing set is worn out and paint leaks. ⇒High voltage can leak from paint which leaked from needle packing set. Clean leaked paint and replace needle packing set (refer to instruction manual of electrostatic gun about how to clean and replace) ✓ When using low resistance paint and insulation stand,, check if high voltage leaks from electrostatic fluid hose～insulation stand. ⇒As high voltage is charged on paint passages from tip of electrostatic gun to paint pump on insulation stand, high voltage can leak if grounded thing is in paint passage and insulation stand, Separate grounded thing from insulation stand by over 30cm.
detection of disconnection of shielded wire	Check connector connection on electrostatic gun side and electrostatic controller side of low voltage cable. If connection of low voltage cable has no problem, shielded wire of low voltage cable can be disconnected. ⇒Replace low voltage cable.
detection of spray set time	Charge again and check if charge is turned ON/OFF normally. If it is detected again, refer to 8 Problems and remedies」, chart 9.
detection of over 2 guns (multi guns use only)	detected only when multi gun control is set.

7. Daily inspection and maintenance

7. 1 Daily inspection and maintenance

Refer to the below chart and periodically inspect electrostatic controller (weekly).

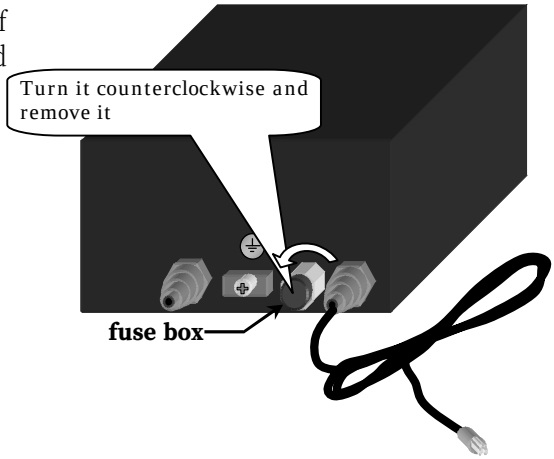
⚠ WARNING	
⚠	(1) Before inspection, be sure to turn off electric source of electrostatic controller and fully release air pressure (refer to P.③ 「avoidance of wrong operation」).

	where to inspect
1. grounding connection of electrostatic controller	Is grounding wire off or worn out ?
2. Remove dirt from electrostatic controller body.	Is dust accumulated ?
3. Low voltage cable 1) Remove dirt. 2) Check outer damage. 3) Check for loose connector.	 Is dust accumulated ? Is outer cover (sheath) damaged or disconnected ? Is connector out of place ?
4. Air hose 1) Remove dirtiness. 2) Check for outer damage. 3) Check for looseness of joint (air leak).	 Is dust accumulated ? Is air hose damaged or scratched ? Is air leaking from loose joint ?

7. 2 How to replace fuse

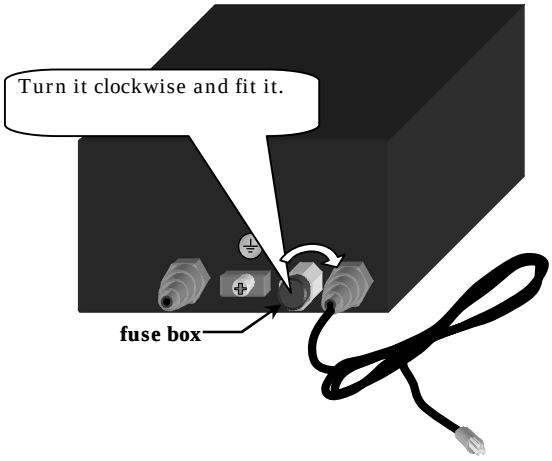
How to replace fuse when fuse is disconnected, is explained below.

Job－1 Turn cover of fuse box counterclockwise at back of electrostatic controller with minus screwdriver and remove cover.



Job－2 Replace fuse(5.2X20mm 250V2.5A) in fuse box.

Job－3 Turn cover of fuse box clockwise with minus drive and fit cover.



8. Problems and remedies

⚠ WARNING	
⚠	(1) Before inspection, be sure to turn off electric source of electrostatic controller and fully release air pressure. (refer to P.③ 「avoidance of wrong operation」).
Important	(1) If you refer to below chart and cannot solve problem, be sure to contact the shop which sold it to you.

problems	causes	remedies
1. Electric source lamp does not light up even if electric source is turned on.	① Main electric source is not turned on. Receptacle comes off.	Turn on main electric source. Insert receptacle.
	② Fuse is disconnected.	Replace with fuse(5.2X20mm 250V2.5A). Refer to **7.2.**
2. Soon after electric source is ON, buzzer sounds and charge lamp flashes.	① Electric source is ON when electrostatic gun is sprayed or external charge signal is ON.	Turn on electric source after you stop spraying electrostatic gun or turn off external charge signal.
3. Soon after electric source is turned on, grounding failure is detected.	① Improper grounding of electrostatic controller	Check grounding of electrostatic controller.
	② Electric source has no grounding phase.	Refer to 4. 1 electric connection
4. Electric source lamp and charge lamp light up. High voltage is not impressed.	① Low voltage cable is not connected.	Check for connection of low voltage cable.
	② Electrostatic gun failure	Contact the shop which sold it to you.
	③ Electrostatic controller failure	Contact the shop which sold it to you.
5. Electric source lamp lights up but charge lamp does not light up even if air spray of electrostatic gun or external charge signal is turned on.	① flow switch failure by dust mixture (hand gun type)	Contact the shop which sold it to you.
	② flow switch failure by dust attached (hand gun type)	Remove air joint from air outlet and air inlet and blow from air inlet and remove dust.
	③ electrostatic controller failure	Contact the shop which sold it to you.
6. grounding failure is detected often.	①Improper connection of grounding wire	Refit or replace grounding wire.
7. Overcurrent is detected.	① Spray distance is continuously short.	Secure proper spray distance.
	② Paint resistance is low. (when using E-M15、ESGX-121)	Increase paint resistance. (change to high resistance solvent when using electrostatic coating paint or paint resistance becomes low due to diluent)
	(when using E-M10、E-A10)	Use insulation stand.
	③ Inside of fluid hose is dirty (when using E-M15、E-A15)	Clean inside of fluid hose.
	④ Paint leaks from needle packing (when using low resistance paint with E-M10、E-A10)	Replace needle packing.
	Electricity leaks from near insulation stand (using E-M10、E-A10 with low resistance paint)	Separate grounded thing from insulation stand by over 3m.
	⑤ Low voltage cable is disconnected.	Replace low voltage cable.
	⑥ Electrostatic gun failure	Contact the shop which sold it to you.
8. Shielded wire disconnection is detected.	① Low voltage cable connector is disconnected.	Reconnect low voltage cable.
	② Shielded wire of low voltage cable is disconnected.	Replace low voltage cable (refer to gun instruction manual)
9. Spray set time is detected even if electrostatic gun is not sprayed over 2 minutes.	① Air leaks from air hose joint.	Tighten air hose joint (stop leak).
	② Air leaks from gun(hand gun)	Replace air valve seat set(refer to gun instruction manual).
	③ Wrong operation of flow switch (hand gun)	Remove air joint from air outlet and air inlet, and blow air from air inlet to remove dust.
	④ Charge signal is not off (auto).	Turn off charge signal.
10. After charging, charge lamp flashes and buzzer sounds intermittently.	① Controller output is improper.	Turn off electric source and turn on electric source with reset key being pushed (keep pushing reset key for 4 seconds). After buzzer sounds 4 times, spray the gun over 5 seconds and charge gun. Check that buzzer sounds again, push fixed key and return to normal mode.

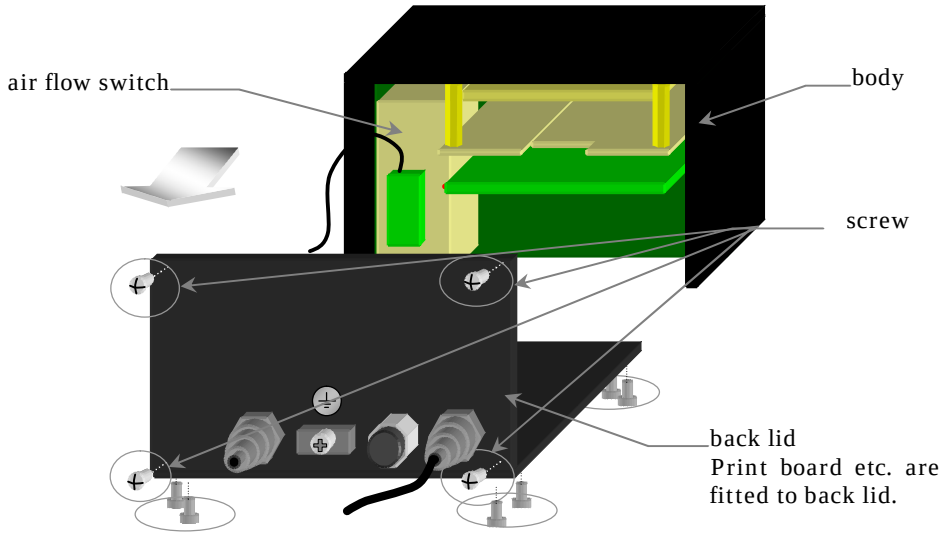
9. High class setting of electrostatic controller

We explain how to make high class setting by using switch of print board in electrostatic controller and connector. Before making such setting, observe below warning.

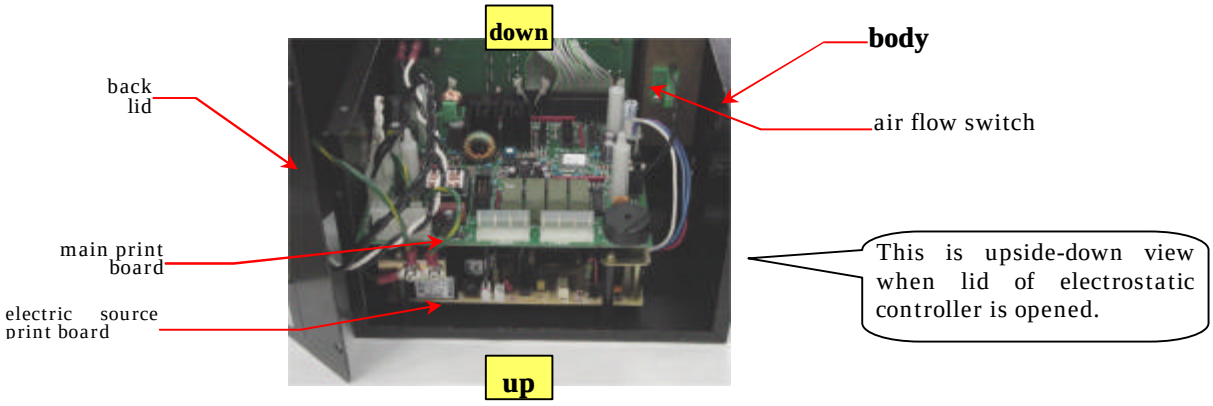
⚠ WARNING	
⚡	(1) Before connection, be sure to pull out plug of electric source cord, disconnect primary side electric source and turn off electric source of all related units.
⚠ CAUTION	
⚡	(1) As you must directly touch print board, only person conversant with this procedure must do this job. (2) If you touch print board while static electricity accumulates on your body, it can damage print board. Before touching print board, be sure to touch metallic section such as screwdriver and release static electricity accumulated on your body.

9. 1 How to disassemble case

Job－1 Remove screws(10 places) on back and bottom of electrostatic controller with screwdriver and pull out back lid. But pay attention not to pull too strongly since cable is connected among main print board on back lid, print board and air flow switch on body side.



Job－2 Electric source print board and main print board are fitted to electrostatic controller.



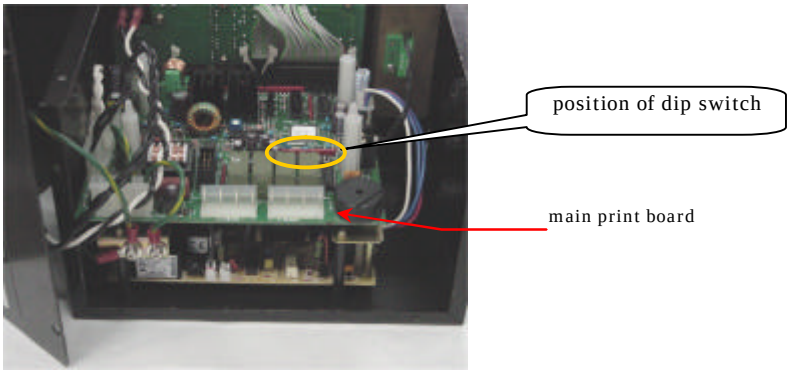
Job－3 After setting print board, close controller body and back lid, and fix with screws.

9. 2 Setting of not to detect grounding connection failure

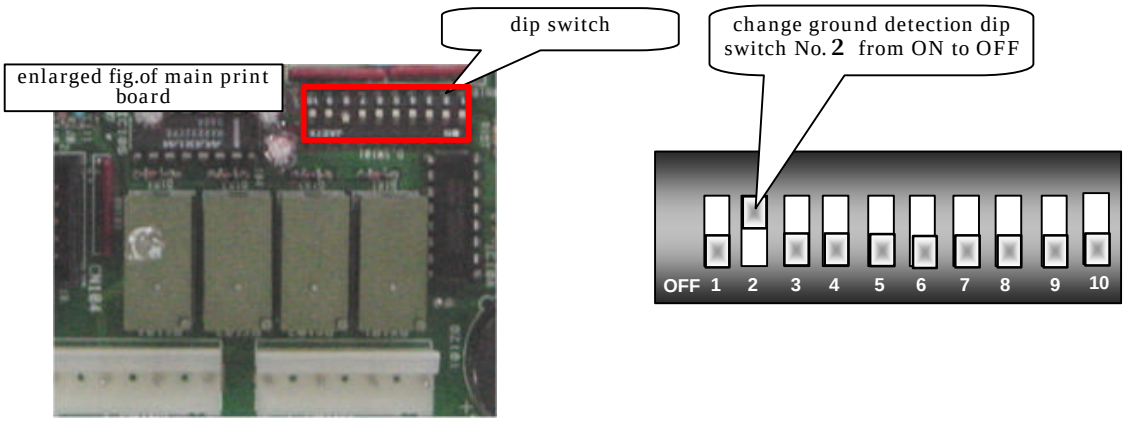
⚠ WARNING	
	(1) Before connecting, be sure to pull out plug of primary side electric source cord and turn off electric source of all related units. (2) This setting makes it impossible to detect grounding failure. But be sure to connect grounding. If not, it can cause leak or fire by spark charge or injury by electric shock.
⚠ CAUTION	
	(1) As you must directly touch print board, only person conversant with this procedure must do this job. (2) If you touch print board while static electricity accumulates on your body, it can damage print board. Before touching print board, be sure to touch metallic section such as screwdriver and release static electricity accumulated on your body.

Job－1 Remove back lid according to 9. 1 job 1～2

Job－2 Look for dip switch on main print board.



Job－3 Change dip switch(No.2) on removed electric source print board from ON to OFF.



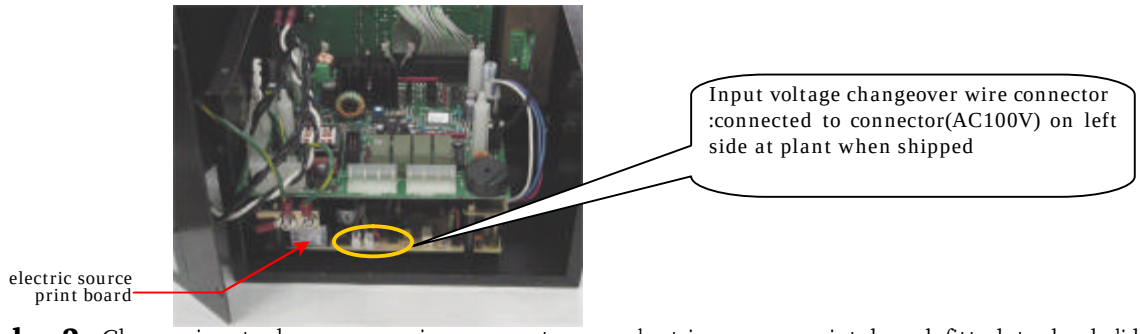
Job－4 After finishing setting, close back lid according to 9. 1 job－3.

9. 3 Change to 200V specifications

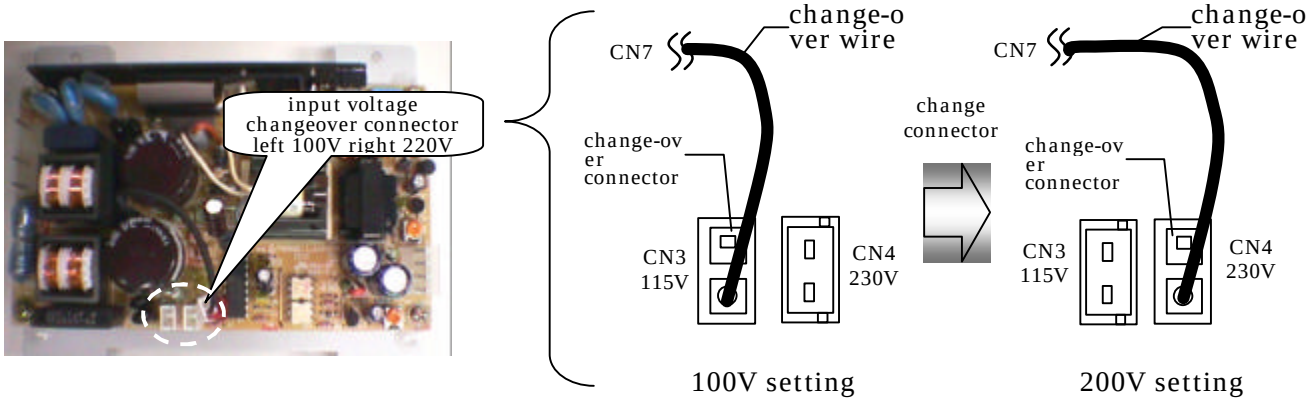
⚠ CAUTION	
⚠	(1) As you must directly touch print board, only person conversant with this procedure must do this job. (2) Before connecting, be sure to pull out plug of primary side electric source cord and turn off electric source of all related units. (3) If you touch print board while static electricity accumulates on your body, it can damage print board. Before touching print board, be sure to touch metallic section such as screwdriver and release static electricity accumulated on your body.

Job－1 Remove back lid according to 9. 1 job 1～2

Job－2 Look for changeover wire connector of input voltage on electric source print board.



Job－2 Change input changeover wire connector on electric source print board fitted to back lid to 200V setting position.



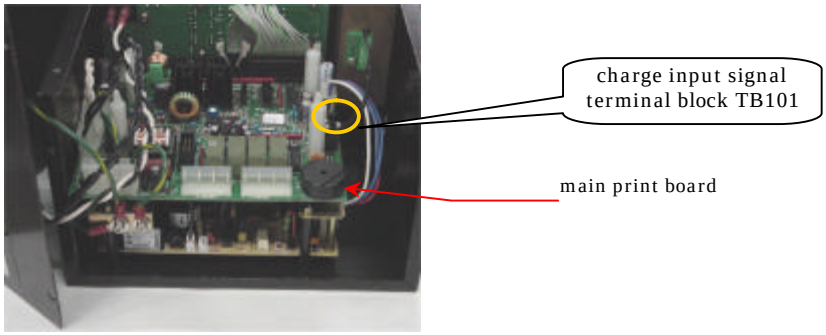
Job－3 After finishing setting, close back lid according to 9. 1 job－3.

9. 4 Connection of external charge input signal

⚠ CAUTION	
⚠	(1) As you must directly touch print board, only person conversant with this procedure must do this job. (2) Before connecting, be sure to pull out plug of primary side electric source cord and turn off electric source of all related units. (3) If you touch print board while static electricity accumulates on your body, it can damage print board. Before touching print board, be sure to touch metallic section such as screwdriver and release static electricity accumulated on your body.

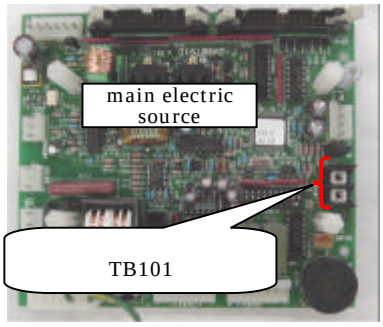
Job－1 Remove back lid according to 9. 1 job 1～2

Job－2 Look for charge input signal terminal block on main print board.

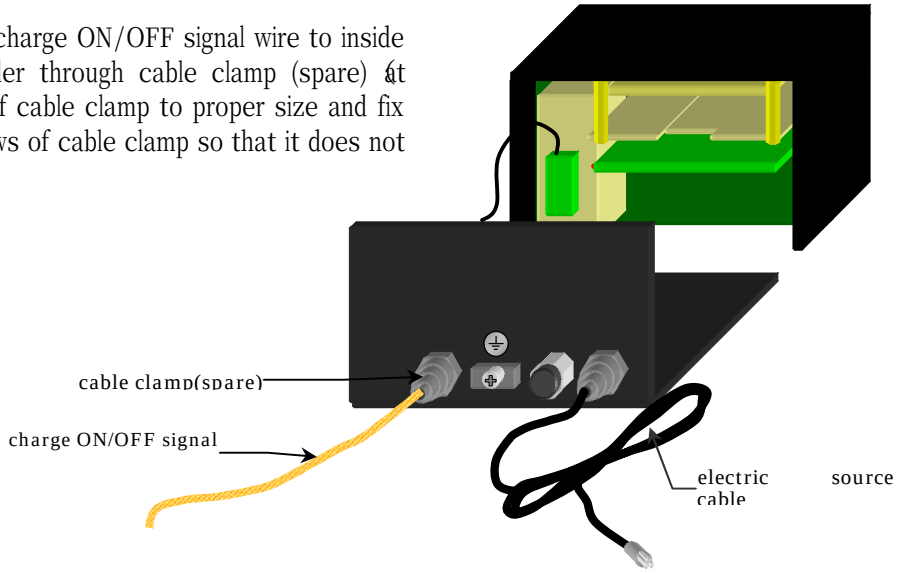


Job－3 Connect external charge signal wire to charge input signal wire terminal block on main print board.

Signal wire from flow switch is connected to this terminal block when shipped from plant. When connecting external charge signal wire, pull out signal wire terminals from flow switch and insulate them.



Job－4 Connect external charge ON/OFF signal wire to inside electrostatic controller through cable clamp (spare) (at that time, cut inlet of cable clamp to proper size and fix signal wire with screws of cable clamp so that it does not move).



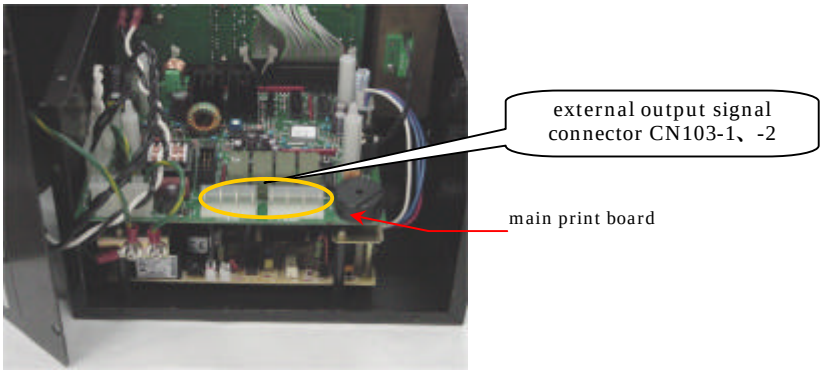
Job－5 After finishing setting, close back lid according to 9. 1 job－3.

9. 5 Connection of external output signal

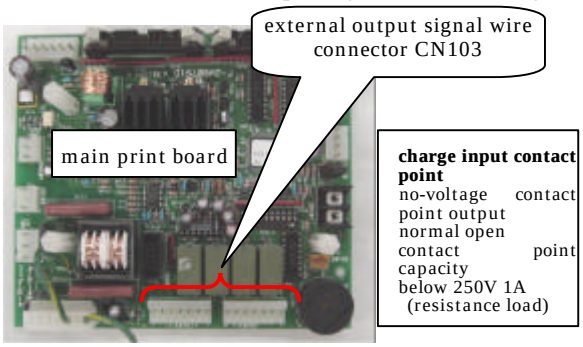
⚠ CAUTION	
⚠	(1) As you must directly touch print board, only person conversant with this procedure must do this job. (2) Before connecting, be sure to pull out plug of primary side electric source cord and turn off electric source of all related units. (3) If you touch print board while static electricity accumulates on your body, it can damage print board. Before touching print board, be sure to touch metallic section such as screwdriver and release static electricity accumulated on your body.

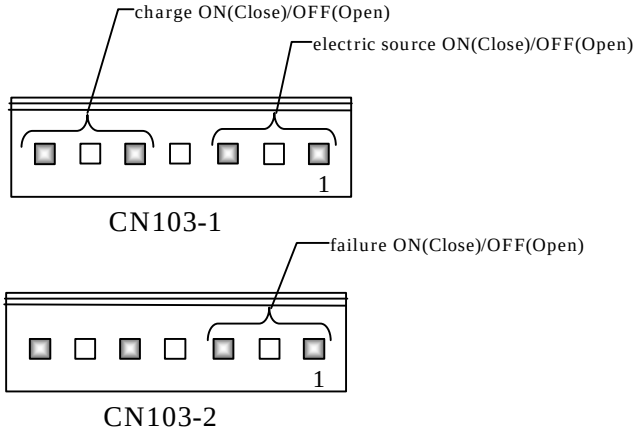
Job －1 Remove back lid according to 9. 1 job 1～2

Job－2 Look for external output signal connector on main print board.

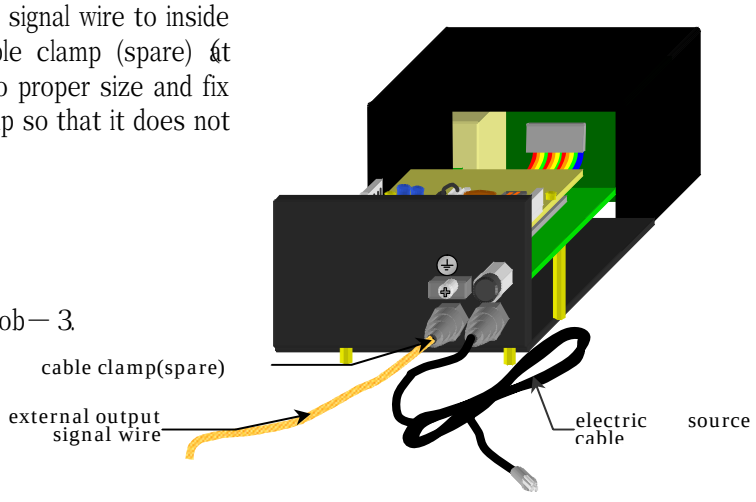


Job－3 Connect external output signal wire to charge input signal wire terminal block on main print board.





Job－4 Connect external charge ON/OFF signal wire to inside electrostatic controller through cable clamp (spare) (at that time, cut inlet of cable clamp to proper size and fix signal wire with screws of cable clamp so that it does not move).



Job－5 After finishing setting, close back lid according to 9. 1 job－3.

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Instruction manual No. 1348-00

Code No. E-SC12-S0-ME1