

Operation and Maintenance Manual

Dual electric field powder hand gun

ECDm



This manual contains important warnings and cautions. Be sure to read this manual carefully before using this machine. Always keep this instruction manual handy until the product is disposed of, if it is lost or soiled, request it from your dealer or us.

Introduction

Thank you for purchasing our product dual electric field powder hand gun <ECDm>.

Please be sure to read this operation manual carefully before using this product so that you can always use it under the optimum conditions.

In particular, please fully understand the items in the specifications and use them according to the correct usage.

This product is used in combination with an electrostatic controller (BPS900m).

Be sure to read the operation manual of the electrostatic controller carefully.

If you have any questions, please contact us by clearly stating the "product number" and "serial number" and contacting us on the back cover.



Please keep this operation manual in a safe place where you can easily refer to it.

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Please understand the contents of this instruction manual and be sure to follow the handling method. If you use it without following this instruction manual, **you may injure your body or damage your equipment and fire.**

The following safety precautions should be considered as minimum basic safety measures when using our products.

● **Precautions are displayed in the following two stages.**



WARNING

Hazards that can result in death or serious injury.



CAUTION

Danger that may result in minor or moderate injury or physical damage only.

● **Other important points are indicated as follows:**

NOTE

Observations to ensure the equipment's performance and functions are fully operational.

In addition, please observe all national and local laws and regulations related to fire, electricity, and safety, as well as the rules and regulations of your own company or business division.

« **Range of use suitable for the product** »

This product is a hand gun that performs coating for using powder paint by installing it in a painting booth equipped with exhaust equipment.

If you use the product under conditions other than the above, it will be used improperly. Also, please be careful as it may cause an accident.

WARNING

Fire and explosion



Preventing fire and explosion in coating shop

- **Do not use halogenated hydrocarbon solvents.**
The aluminum alloy contained in this product's components may undergo a chemical reaction and explode.
- **Do not use this product outside its specifications.**
Using it out of specification range may result in a fire hazard.
- **Provide adequate ventilation with ventilation equipment.**
Volatilized organic solvents and other substances may remain and ignite, creating a risk of fire.
- **Clean the coating room and exhaust system (ducts and fans) regularly.**
If the accumulated powder simply peels off, a spark may occur, which could cause a dust explosion.
In the unlikely event of a fire, paint residue etc. will make it easier for the fire to spread and result in greater damage.



Prevent fire and electric shock caused by faulty earthing

- **All conductive objects in the coating booth (paint containers, peripheral equipment, etc.) must be grounded with an earth wire.**
In an atmosphere ionized by high voltage, poorly grounded conductors can become charged, creating a risk of fire or electric shock due to spark discharge.
The earth should be **Class D grounding or higher** (ground resistance 100 Ω or less).
- **Always keep the workpiece earthed.**
Risk of fire or electric shock due to spark discharge from charged workpieces.
- **The injector and paint hose must be grounded with an earth wire.**
Static electricity can cause spark discharge, which can result in fire or electric shock.
When paint flows through the injector and paint hose, static electricity is generated and becomes charged.
- **The electrostatic controller must be grounded with an earth wire.**
Static electricity can cause spark discharge, which can result in fire or electric shock.
The machine is also grounded via the electrostatic controller, so be sure to connect the earth wire with screws or other fasteners to prevent it from coming loose.
- **Be sure to periodically remove any paint that has stuck to the hanger.**
If paint adheres to the contact part between the hanger and the object, there is a risk of fire or electric shock due to poor earthing.
The ground resistance value should be 1k Ω or less for metal (1M Ω or less for resin) (measurement voltage should be 500V or more).



WARNING

Fire and explosion



Prevent fire and electric shock caused by faulty earthing

- **Do not place any items in the coating booth that are not necessary for coating.**
Static electricity can cause spark discharge, which can result in fire or electric shock.
- **Paint operator must take precautions to prevent static electricity.**
Static electricity builds up on the human body, causing sparks to discharge, which may result in fire or electric shock.



Prevent fires caused by ignition of paints and solvents

- **When nozzle cleaning, turn off the power to the electrostatic controller.**
If high voltage is applied during nozzle cleaning, there is a risk of fire.
- **Do not bring any spark-producing devices, matches, lighters, etc.**
Risk of explosion or fire due to ignition of flammable materials.

Equipment misuse



Preventing accidents caused by poor maintenance

- **Any abnormal noise, vibration or high voltage leakage, immediately stop operation.**
Product damage may result in a fire hazard.
- **Do not operate if any parts are damaged or missing.**
Product damage may result in a fire hazard.

WARNING

Human protection



Protection from high voltage

- **Please wear anti-static shoes.**
Static electricity builds up on the human body, causing sparks to discharge which may result in fire or electric shock.
- **Do not touch anything other than the gun grip while high voltage is applied.**
Touch with high voltage parts may result in electric shock.
- **The coating work floor must have an anti-static construction with a leakage resistance of 1 MΩ or less.**
There is a risk of electric shock to the operator.
The scope of the antistatic structure is the entire work floor in a closed paint room.
In an open paint booth, it is the area surrounded by 1.5m on either side of the booth opening and 2.5m in front of it.
To maintain the antistatic effect, clean the work floor when it becomes dirty.
- **Do not use this product if you have a pacemaker.**
The high voltage of this product may cause pacemakers to malfunction or stop functioning.



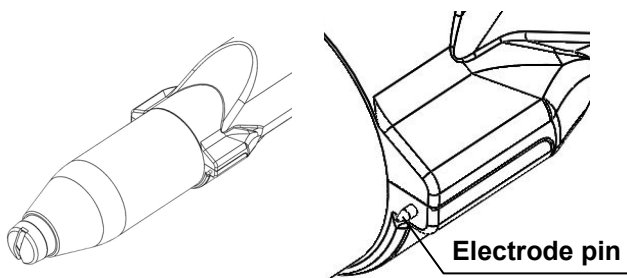
Protection from solvents, air and paint pressure

- **Do not spray paint towards person**
Harmful substances may cause serious injury, including inflammation and poisoning.
Pressurized paint can cause personal injury.
- **Wear protective glasses, a protective mask, and protective gloves^{*1} when handling paint.**
Harmful substances may cause serious injury, such as inflammation or poisoning.
Carefully read the safety data sheet (SDS^{*2}) of the paint you are using and take appropriate exposure prevention and protective measures.
^{*1} When using protective gloves for skin absorption protection or to prevent dirt, it is necessary to prevent static electricity from building up on the human body.
Be sure to ground it properly. (Recommended protective gloves are those specified in JIS T8118, or earth bands, etc.)
^{*2} SDS : Safety Data Sheet

《Warning and precautions for safe use》

WARNING

- **Do not use this product outside its specifications.**
Using it out of specification range may result damage to the product.
- **Do not immerse the coating machine, connection/extension cable or hoses in cleaning solvent.**
Electrostatic sprayer are electrical machines, immersing them in cleaning solvents may cause break down.
- **Connection/extension cable and hose should be hung from the ceiling or side walls and not dragged across the floor.**
It may cause damage such as scratches.
When using conductive paint, be sure to suspend the paint hose from an insulating material such as a rubber tube.
- **When cleaning the nozzle, never use a metal brush, use a bamboo brush or similar.**
It may damage the nozzle and result in poor coating.
The nozzle is an important part of the sprayer.
If you use a metal brush to damage the nozzle, it will become difficult to maintain uniform spray conditions.
- **Always keep a distance of at least 150mm between the tip of the nozzle and the work piece.**
The potential at the tip of the nozzle will decrease, causing poor coating results.
- **Check frequently for paint leaks, air leaks, and loose screw.**
- **Do not touch the electrode pins of the spray gun carelessly.**
The electrode pin may pierce the body and cause injury.
Be careful when handling the electrode pin as they are easily pierced.



● **A fire extinguisher should always be kept near the work area.**

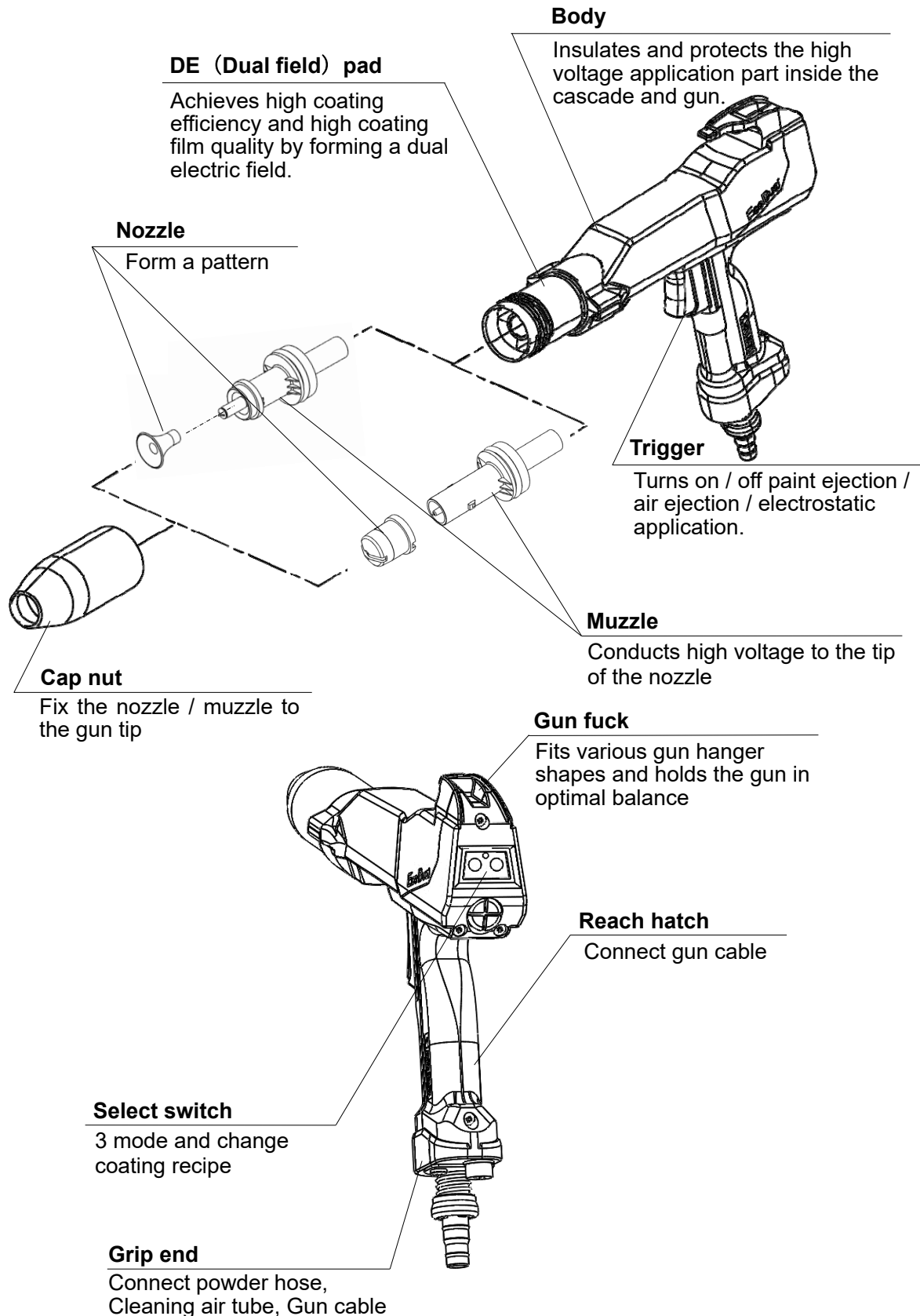
In case of a fire, make sure to have equipment that has been regularly inspected installed at all times.

● **When disposing of this product, please dispose of it in accordance with the laws of your country.**

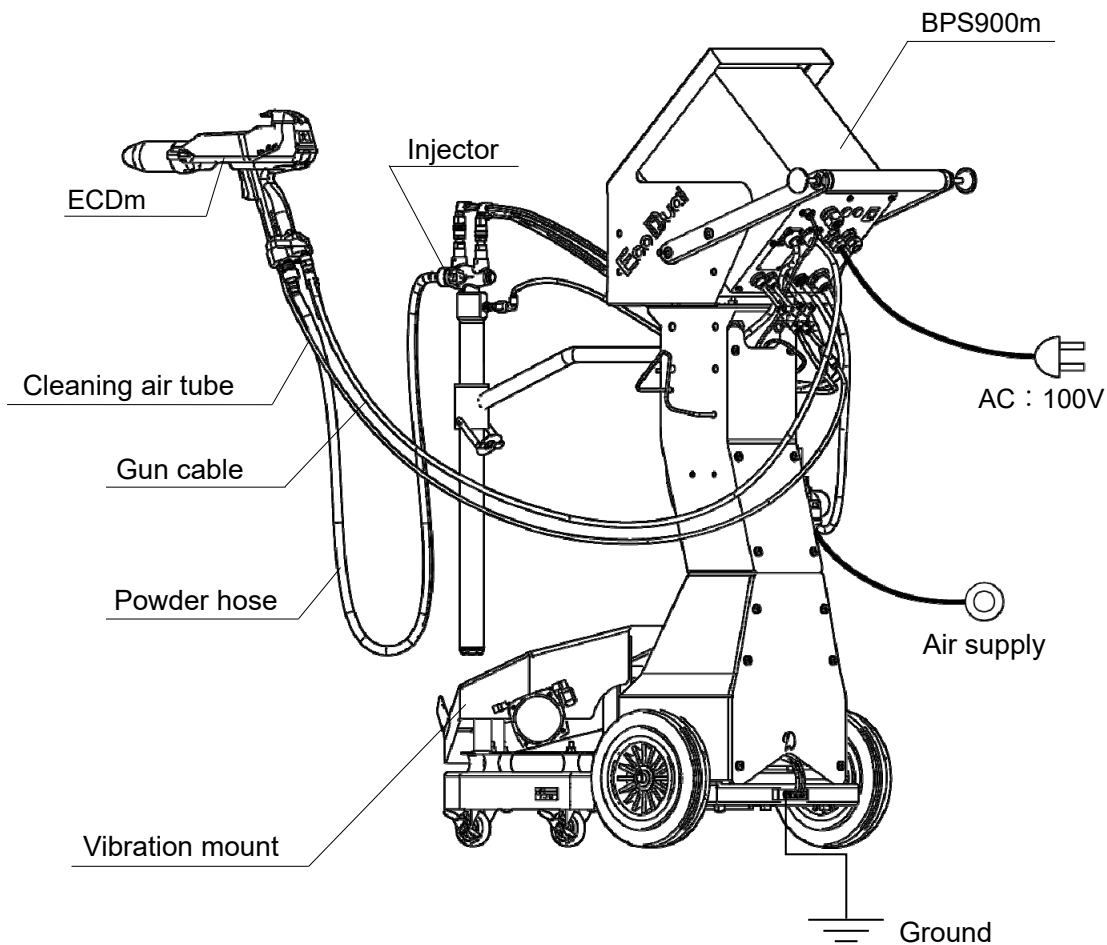
2

Equipment overview

2.1 Main body part name and role



2.2 Installation example ~AXR II -100DF unit~



NOTE

The electrostatic controller (unit part) is installed outside the painting booth and at the booth opening or 1.5m away from the entrance/exit.

NOTE

This painting machine is basically a component of the hand gun unit.
For details on the hand gun unit, refer to the hand gun unit instruction manual.

NOTE

Since it is an optional item, prepare a nozzle with specifications that match the application.

2.3 Related incidental equipment

- Related incidental equipment is necessary equipment for operating this product.
Please select an appropriate device from the following contents according to the application and usage conditions, and arrange it separately.

2.3.1 Nozzle muzzle (model: PFX / PRX series): Sold separately

- It is a part that is attached to the tip of the painting machine and has the function of forming a spray pattern by the jet of compressed air.
- Select an air cap with specifications that match the intended use from the table below.

! WARNING

Be sure to use the nozzle dedicated to ECDm.

It may lead to equipment damage or unexpected accidents.

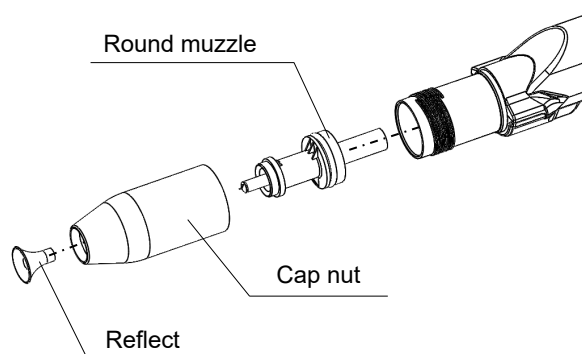
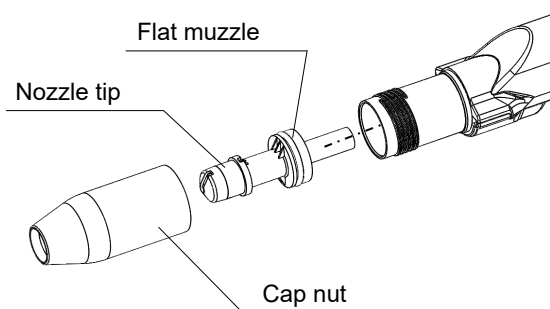
Nozzle, Muzzle

Flat nozzle

Model:PFX

Round nozzle

Model:PRX



< Nozzle selection reference >

Flat nozzle (PFX)

Part No.	Part name	Effective pattern width
15E3-1	Flat nozzle SN	About 130mm
15E2-1	Flat nozzle N	About 170mm
15E4-1	Flat nozzle W	About 200mm
15E1-1	Flat nozzle SW	About 230mm
15E5-1	Flat nozzle SSW	About 250mm

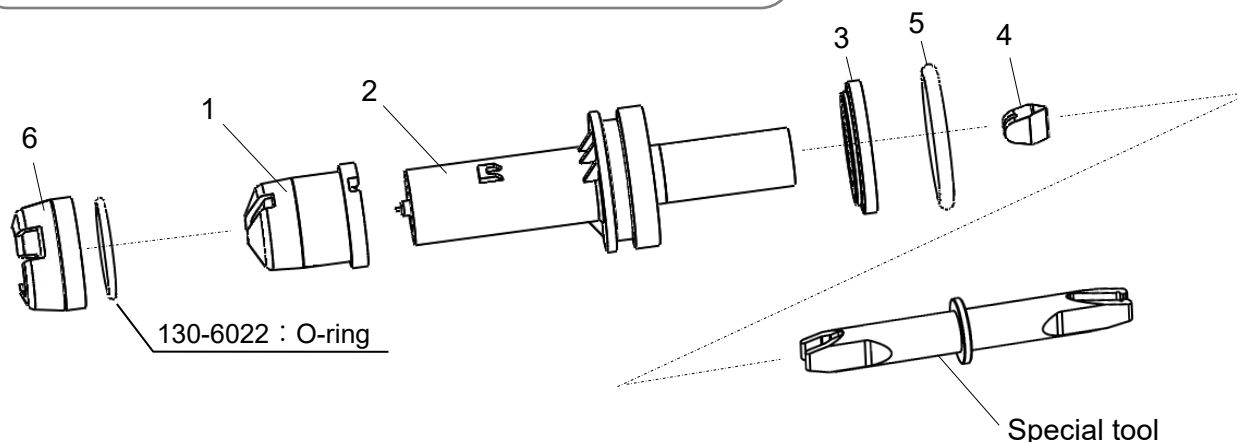
※Gun distance 200mm

Round nozzle (PRX)

Part No.	Part name	Effective pattern width	Use example
15E7-1	Round nozzle	-	Inside pipe or something

Nozzle, Muzzle Part No. List

Flat nozzle					
15E1-1	15E2-1	15E3-1	15E4-1	15E5-1	15E6
Nozzle SW	Nozzle N	Nozzle SN	Nozzle W	Nozzle SSW	Pattern cap

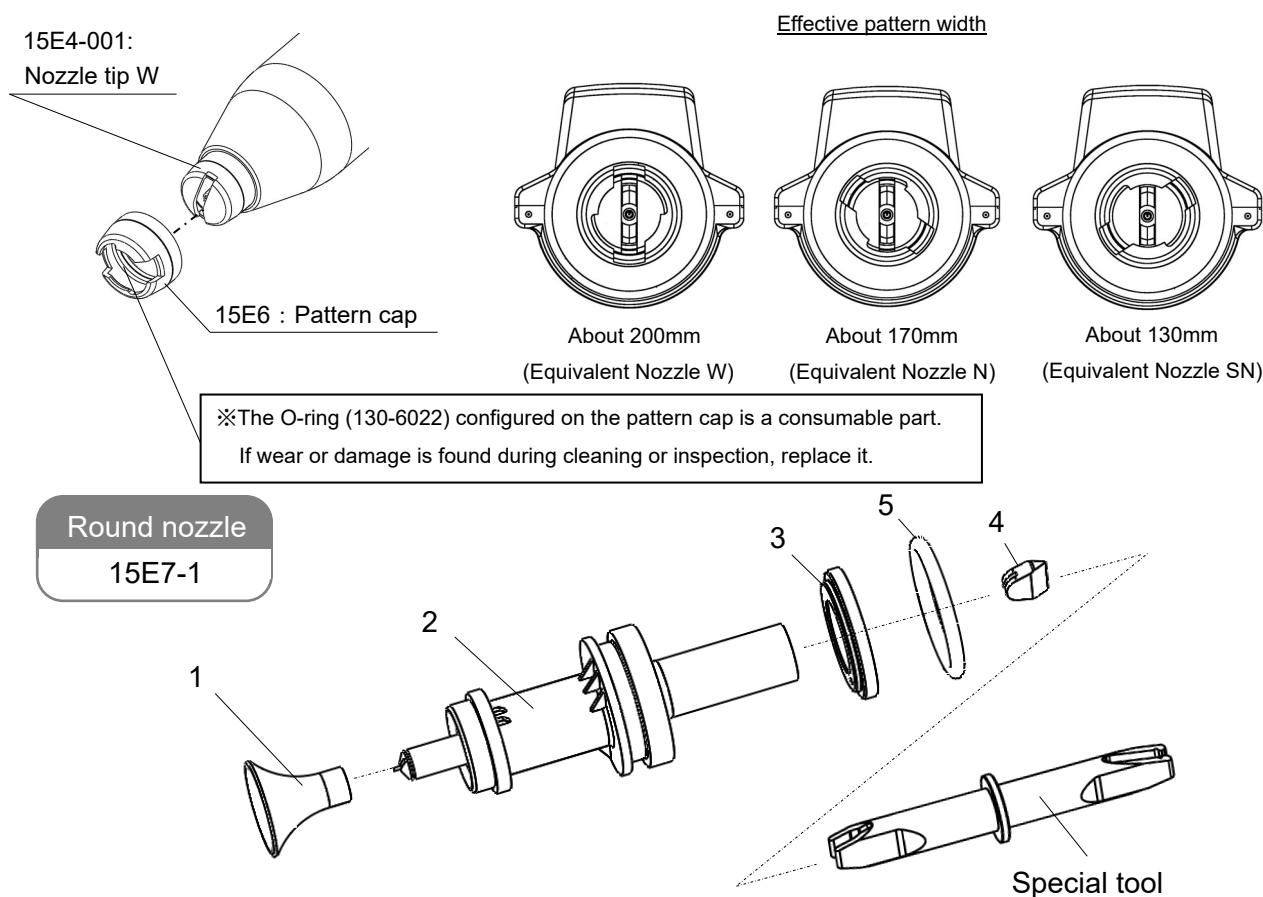


No.	Part No.	Part Name	Q'ty	Remark
1	15E3-001	Nozzle tip SN	1	Effective patter width About130mm
	15E2-001	Nozzle tip N	1	Effective patter width About170mm
	15E4-001	Nozzle tip W	1	Effective patter width About200mm
	15E1-003	Nozzle tip SW	1	Effective patter width About230mm
	15E5-001	Nozzle tip SSW	1	Effective patter width About250mm
2	15E1-101	Flat muzzle assy	1set	Includes contact ring
3	15E1-001-4	Contact ring	1	Contact ring only
4	15E1-102	Rear end holder	1	
5	102-9025	O-ring	1	
6	15E6	Pattern cap	1set	For Nozzle W (Option)
Tool	8906-102	Swap tool	1	For attachment/detachment of rear end of holder

NOTE

- For general use of hand guns (objects to be coated that are not complicated shapes), it is recommended to select the nozzle tip W. However, when selecting the optimum nozzle tip for various objects to be coated, perform a coating test before making a decision.
- Depending on the paint, the rear end of the holder may wear out in a short period of time. Please use 15E1-004 (Option) of wear resistant specification. Please note that wear-resistant specifications may cause paint adhesion or clogging.

- A pattern cap (15E6) sold separately is available for the nozzle tip W (15E4-001).

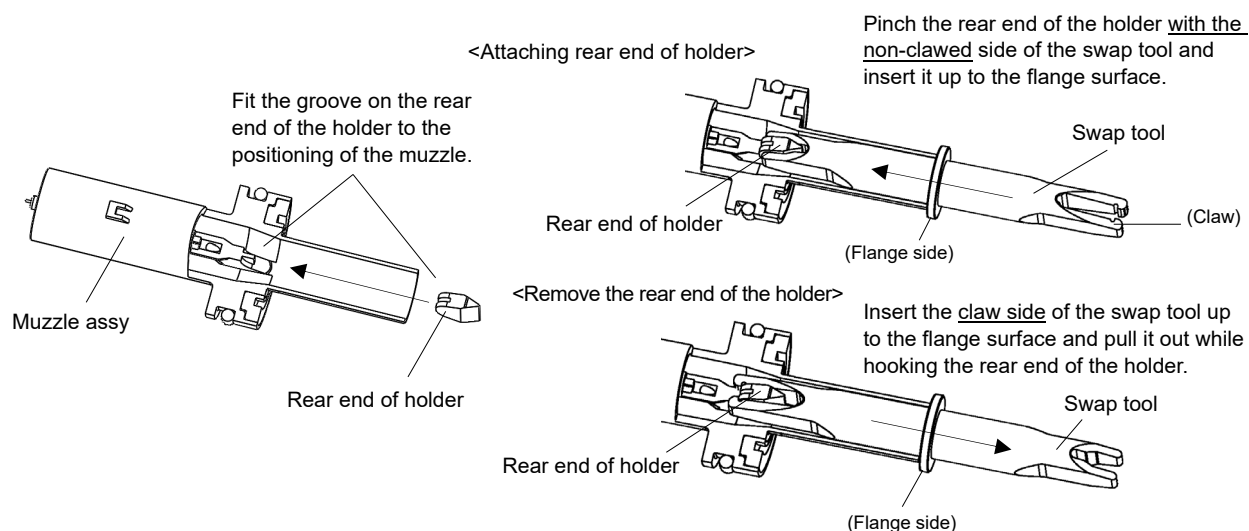


No.	Part No.	Part name	Q'ty	Remark
1	15FF-003	Reflect Φ16	1	
	15FF-004	Reflect Φ24	1	
	15FF-005	Reflect Φ32	1	
2	15E7-101	Round muzzle assy	1set	Includes contact ring
3	15E1-001-4	Contact ring	1	Contact ring only
4	15E1-102	Rear end holder	1	
5	102-9025	O-ring	1	
Tool	8906-102	Swap tool	1	For attachment/detachment of rear end of holder

NOTE

- Depending on the paint, the rear end of the holder may wear out in a short period of time. Please use 15E1-004 (Option) of wear resistant specification. Please note that wear-resistant specifications may cause paint adhesion or clogging.

Method attachment/detachment of rear end of holder



2.3.2 Powder hose: Optional item

- A powder hose for sending paint from the injector to the coating machine.

Normally, $\Phi 11$ is recommended. Please use $\Phi 12$ under the condition that the discharge amount (g / min) is large.

Part No.	Part Name	Specification
640-0000	Powder hose	I.D. $\Phi 11$ /O.D. $\Phi 16$
641-0000		I.D. $\Phi 12$ /O.D. $\Phi 18$

※Tell your dealer what length you need.

※Minimum : 1m

2.3.3 Cleaning air tube : Optional item

- It transfers air to the electrodes and prevents paint from accumulating.

Part No.	Part Name	Specification
586-0000	Urethane tube	I.D. $\Phi 4$ /O.D. $\Phi 6$

※Tell your dealer what length you need.

※Minimum : 1m

2.3.4 Gun cable : Optional item

- It supplies power to the main body of the coating machine. Also, the gun cable can be extended.

(Up to 30m possible)

Part No.	Part Name	Specification
2582	Gun cable	10m
2576	Extension cable	10m

2.3.5 Magic cable tie

- Tie powder hose, cleaning air tube and gun cable.

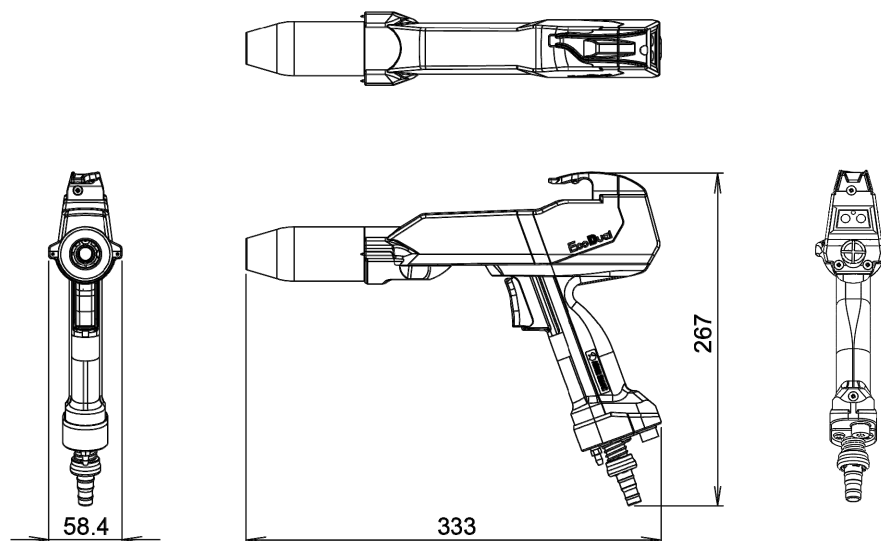
Part No.	Part Name	Specification
316-0177	Magic cable tie	Please refer to P.18 for how to use. Length: 125mm

※1pack 20set

3

Specifications

3.1 External shape



3.2 Product specifications

Series	Eco Dual			
Name	Dual electric field hand gun			
Model	ECDm			
Adaptive paint	Powder paint			
Paint discharge	General usage range : 50~350g/min ※Depend on paint, hose length, injector and something.			
Maximum charge voltage	DC-80kV			
Maximum current	80μA			
Usage environment	Temperature : 5~40℃ Humidity : 40~80%RH			
Weight	593g (Without Nozzle/Muzzle, Gun cable)			
Electrostatic controller	BPS900m			
Gun cable length	10m ※Maximum length is 30m with extension cable.			
Input air condition	JIS B8392-1:2012		Quality rank 162	Quality rank 131
	Containing solid particles (1m ³ per) ※Particle size : d	0.1μm<d≤0.5μm	Less than 20000	Less than 20000
		0.5μm<d≤1.0μm	Less than 400	Less than 400
		1.0μm<d≤5.0μm	Less than 10	Less than 10
	Moisture content (g/m3)		Less than 1.37 (Dew point under atmospheric pressure -17℃)	Less than 0.144 (Dew point under atmospheric pressure -42℃)
	Amount of oil contained (mg/m3)		Less than 0.1	Less than 0.01
	※The quality of compressed air supplied to our painting equipment is quality grade 162 or higher. Please. (Quality grade 131 is recommended)			

4

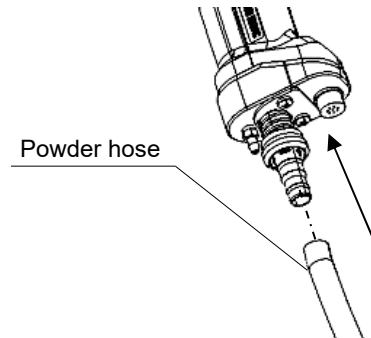
Preparation for use of equipment

To start using the device, follow the procedure below.

4.1 Connection of powder hose

Connect the powder hose that conveys the paint between the hand gun unit and the electrostatic gun.

(Applicable tube inner diameter = $\Phi 11$ or $\Phi 12$: standard)



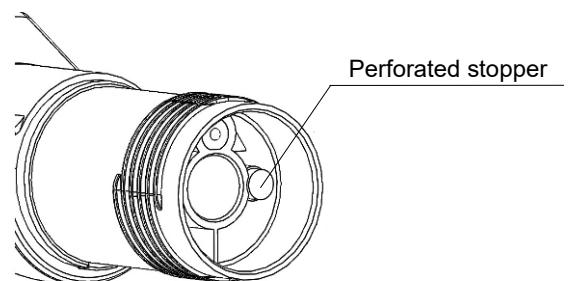
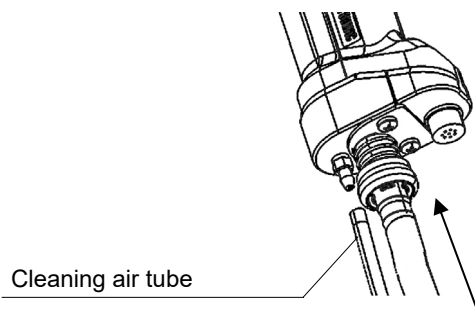
4.2 Connection of cleaning air tube

Connect the cleaning air tube for nozzle cleaning between the hand gun unit and the electrostatic gun.

(Applicable tube I.D. = $\Phi 4$ mm/O.D. $\Phi 6$ mm)

Be sure to supply air to maintain the cleaning air function. (Recommended air flow rate: 6-8L / min)

※Before using cleaning air, make sure that a perforated stopper is attached to the tip of the gun.



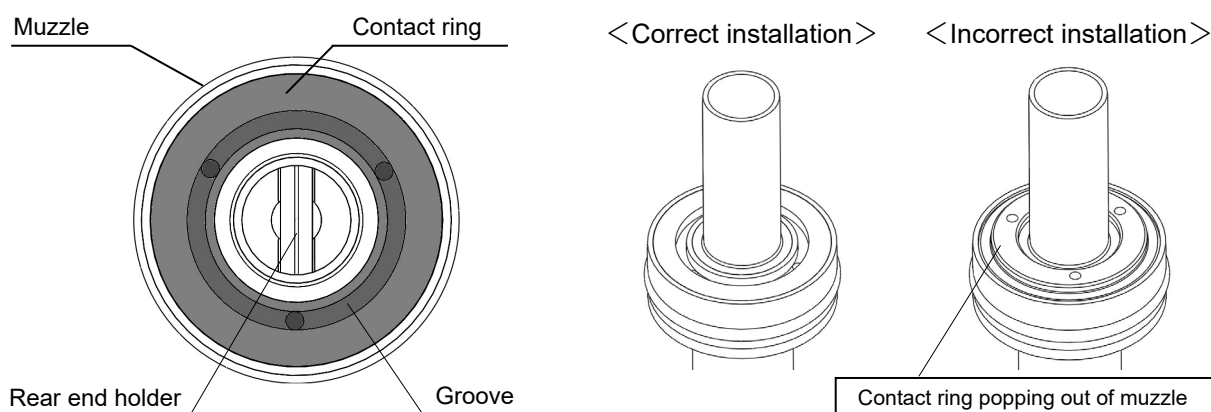
4.3 Nozzle installation

- ① Before installing the nozzle, check that the contact ring of the muzzle and the rear end of the holder are properly installed.

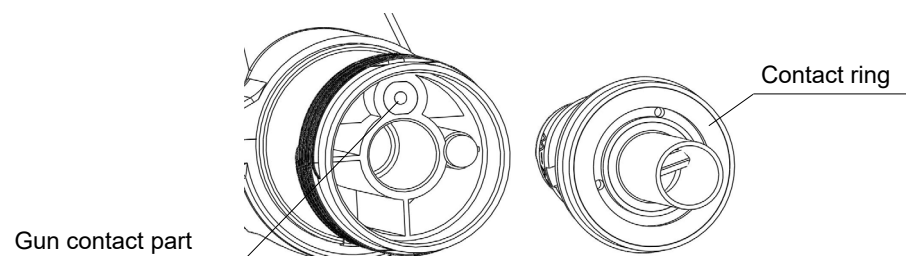
CAUTION

It may lead to poor painting or equipment failure.

**When attaching the muzzle to the corona handgun, make sure it is properly installed so that the groove on the contact ring is facing up.
(See the figure below)**

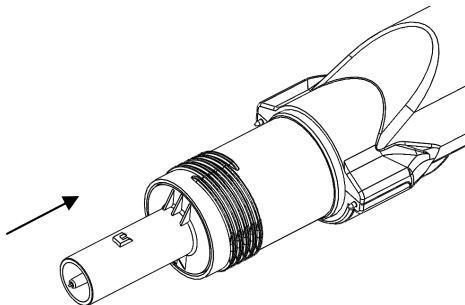


- ② Make sure there are no foreign objects between the muzzle contact ring and the gun contact area.

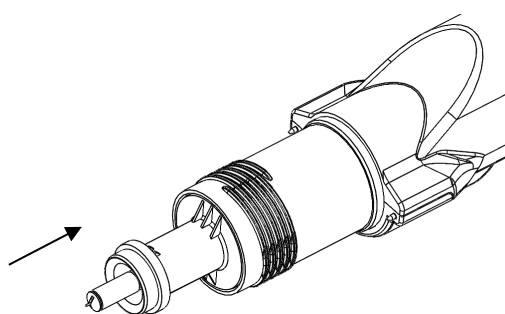


- ③ Insert the muzzle into the tip of the gun

Flat muzzle

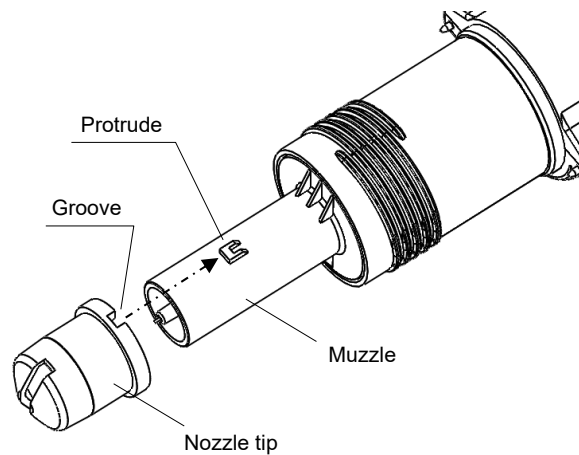


Round muzzle

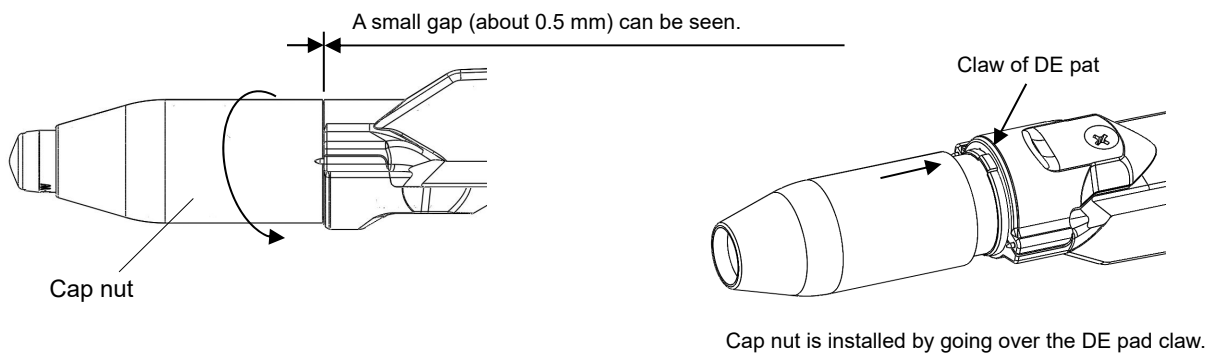


④ When using a flat nozzle, attach the nozzle tip.

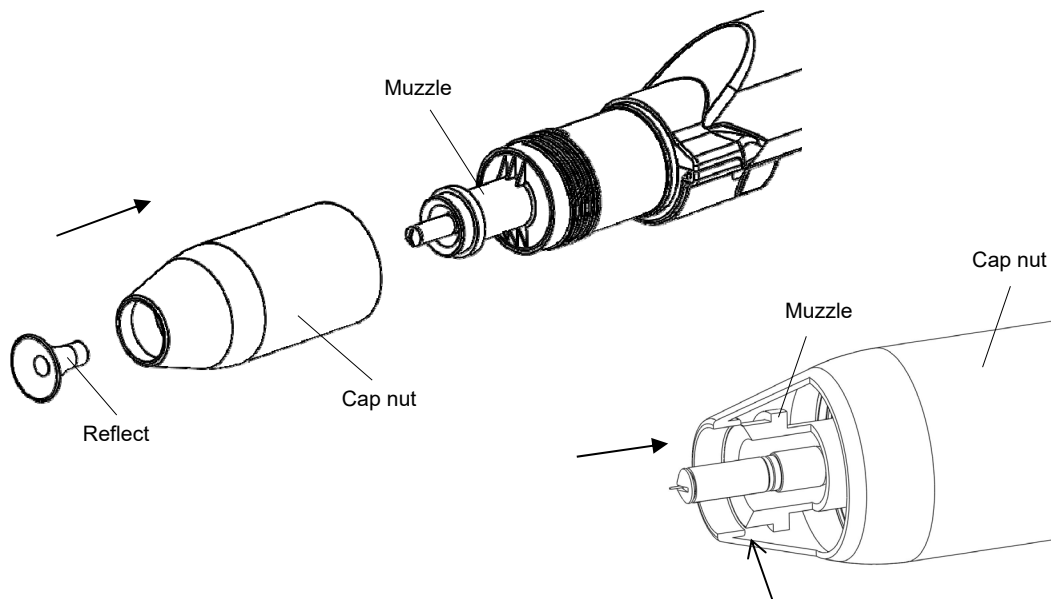
※ When installing, align the groove of the nozzle tip with the protrusion of the muzzle.



⑤ Tighten the cap nut to fix the nozzle tip and muzzle.



⑥ When using a round nozzle, attach a reflector to the tip of the holder at the end.

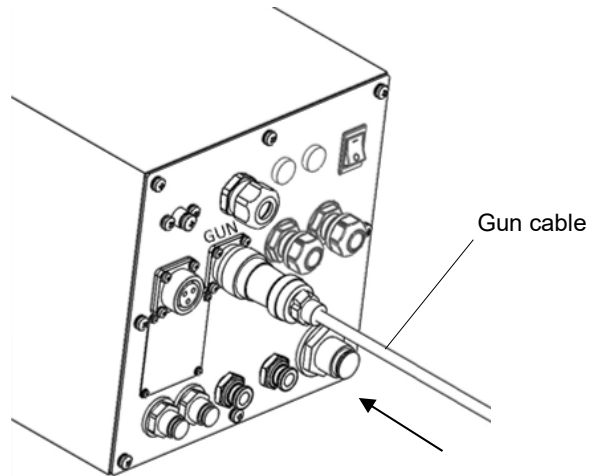


Note) Because the clearance between the cap nut and the muzzle is small.
Forcibly tightening may cause damage due to interference.
Look from the front of the gun and tighten while fine-tuning the cap nut.

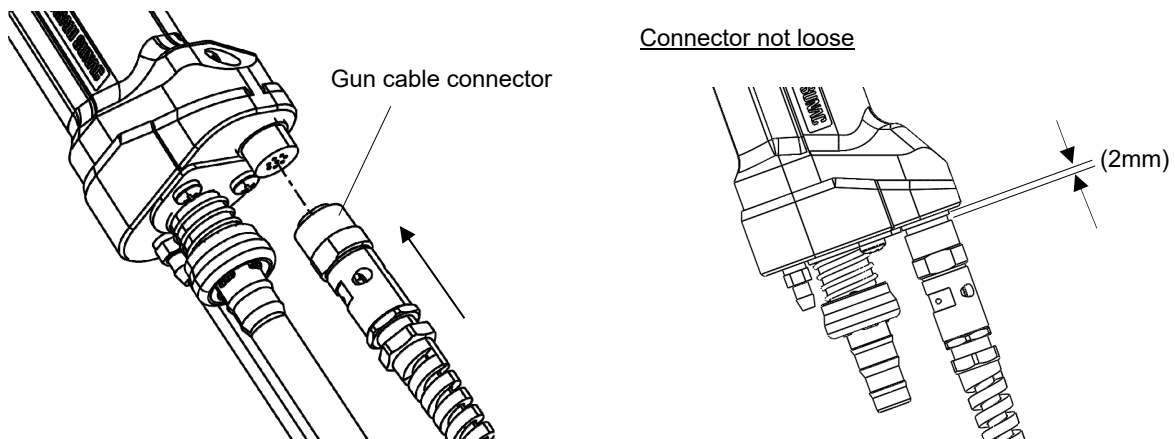
4.4 Gun cable connection

Connect the gun cable connector to the connector on the back of the hand gun unit electrostatic controller that has "GUN" printed on it.

At this time, tighten firmly so that the metal outlet does not come loose.



Make sure that the power of the electrostatic controller is not turned on, and connect the gun cable connector to the hand gun. Make sure it is not loosened regularly, such as before use.



CAUTION

It may lead to poor painting or equipment failure.

- If the connector is dirty, wipe it off with a clean cloth.
- When connecting or disconnecting for connector of gun cable, always by hand without using any tools.

5

Painting preparation and painting work

5.1 Paint supply

Please supply the paint from the powder paint supply device.

NOTE

Please refer to the instruction manuals of "Dual electric field type powder hand gun unit" and "Electrostatic controller BPS900m" for the supply method and supply setting method of powder paint.

CAUTION

If you use any of the following paints, please check them carefully before use.

- High specific gravity paint may reduce the discharge rate.
- Paints containing hard pigments may wear out the inside of the paint path of the gun and accelerate the wear of parts.
- Because fine particle size paint tends to adhere to the paint path of the gun, check the path when preparing to paint.

5.2 Spraying distance

Too far spray distance reduces electrostatic effects while powder paint particles are blown by impacts of transfer air in too close distance. The paint transfer efficiency declines in either case. Moreover, electrostatic sparks may be generated if the gun is rapidly brought closer to the object to be coated while high voltage is applied. Paint in a spray distance suitable for the voltage of the gun tip.

(The spray distance should be 100 mm to 200 mm as guideline.)

WARNING

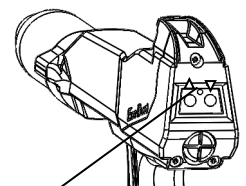
There is a risk of ignition due to electrostatic sparks.

- Maintain an appropriate spraying distance for the corona hand gun during electrostatic coating work. In particular, be careful not to suddenly bring the gun close to the ground conductor.
- Be especially careful when using powder paints containing low resistance substances such as metallic pigments. Clean the gun tip (around the discharge electrode) and the paint passage inside the gun diligently so that metallic pigments, etc. do not stick or accumulate. Also, follow the paint manufacturer's recommendations and instructions.

5.3 Select switch

The coating mode can be changed by operating the select switch on the back of the gun.

- △ Press the button: Flat plate mode⇒complex mode⇒Repainting mode⇒Flat plate...
- ▽ Press the button: Flat plate mode⇒Repainting mode⇒complex mode⇒Flat plate...



Select switch

By changing the setting of the electrostatic controller, you can increase or decrease the discharge amount (%) or change the painting recipe number.

5.4 Handling at the time of work interruption and end

If the paint is stuck to the paint path, nozzles and electrodes inside the gun, a stable spray pattern cannot be obtained, so clean it frequently.

- ① Perform the "cleaning mode" with the controller to clean the powder hose and the paint path inside the gun.
- ② Remove the powder hose and clean the inside of the gun with an air blow.



WARNING

There is a risk of electric shock

- When cleaning the nozzle, do not forget to switch off the power switch of the electrostatic controller.
- Ground all metal objects in the painting room.

NOTE

For the procedure at the end of the interruption of painting work in each gun unit, please refer to the instruction manual of "Dual electric field powder hand gun AXRII series".

⚠ CAUTION

(1) In order to prevent the strength and life of the gun cable from decreasing, be sure to observe the following items when connecting the ECDm gun cable.

① Do not tie the gun cable within a range of about 70 cm from the hand of ECDm.

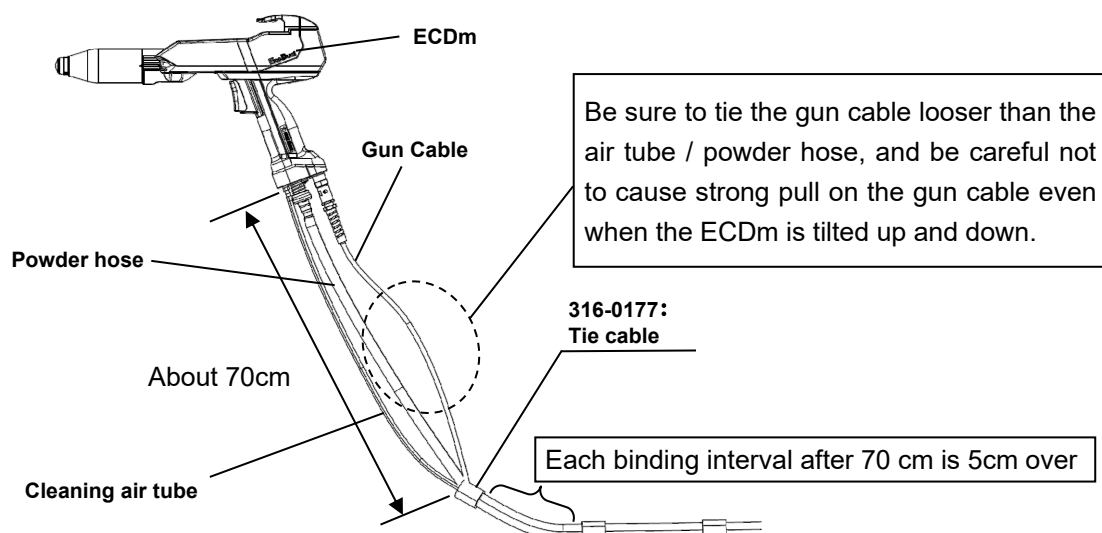
② To prevent the gun cable from being strongly bent or pulled when the ECDm is urned up and down, left and right.

Bind the gun cable with a margin to the air tube and powder hose.

③ For binding 70 cm or more from the hand of ECDm, use Magic Cable Tie (Product No.: 316-0177), leave a pitch of 5 cm or more with vinyl tape, and tie it loosely without tightening too much.

In particular, do not wrap it continuously with vinyl tape or a wide spiral tube. The wound part becomes a rod shape, and both ends are broken and the gun cable or powder hose is broken.

Or it may cause destruction.



(2) Do not operate the ECDm or bind the gun cable so that the gun cable, air tube, or powder hose is forcibly bent or pulled strongly during painting. The strength may decrease and the wire may break.

(3) Be careful not to step on the gun cable.

Especially if you step on a metal drain board, there is a risk of disconnection.

(4) Do not wrap the gun cable alone (especially near the ECDm connector) continuously with vinyl tape to reinforce it and prevent it from getting dirty. It may cause a decrease in strength and disconnection.

(5) Do not allow the gun cable to come into contact with organic solvents or paint for a long time or to immerse it. The gun cable deteriorates, and its strength and life are extremely reduced.

(6) Do not use metal to bind the gun cable. Static electricity may accumulate on metal objects and you may feel a tingling sensation.

6.1 Nozzle maintenance

Perform regular inspections for the items in the table below.

The inspection period is a guide and will vary depending on the usage conditions.

Inspection	Inspection method	Inspection time
Check for paint sticking and wear on flat nozzles	① Turn off the power switch of the electrostatic controller. ② Remove the flat nozzle. ③ Check for paint sticking and wear on the nozzle tip. ※ If paint sticking is found on the nozzle tip, remove it. ※ If significant wear is found on the nozzle tip, replace the nozzle tip. ④ Check for paint sticking and wear on the electrode holder. ※ If paint sticking is found on the electrode holder, remove it. ※ If significant wear is found on the electrode holder, replace the rear end of the electrode holder or the flat muzzle assembly. ⑤ Check that the paint adheres to the discharge electrode. ※ If paint sticking is found on the discharge electrode, remove it.	At the end of work, or when a coating film defect or ejection defect occurs.
Check for paint sticking and wear on the round nozzle	① Turn off the power switch of the electrostatic controller. ② Remove the round nozzle. ③ Check for paint sticking and wear on the reflector. ※ If paint sticking is found on the reflector, remove it. ※ If the reflector is found to be significantly worn, replace it. ④ Check for paint sticking and wear on the electrode holder. ※ If paint sticking is found on the electrode holder, remove it. ※ If significant wear is found on the electrode holder, replace the rear end of the electrode holder or the round muzzle assembly. ⑤ Check that the paint adheres to the discharge electrode. ※ If paint sticking is confirmed on the discharge electrode, remove it.	At the end of work, or when a coating film defect or ejection defect occurs

WARNING

There is a risk of electric shock.

When inspecting the nozzle, be sure to turn off the power switch of the electrostatic controller.

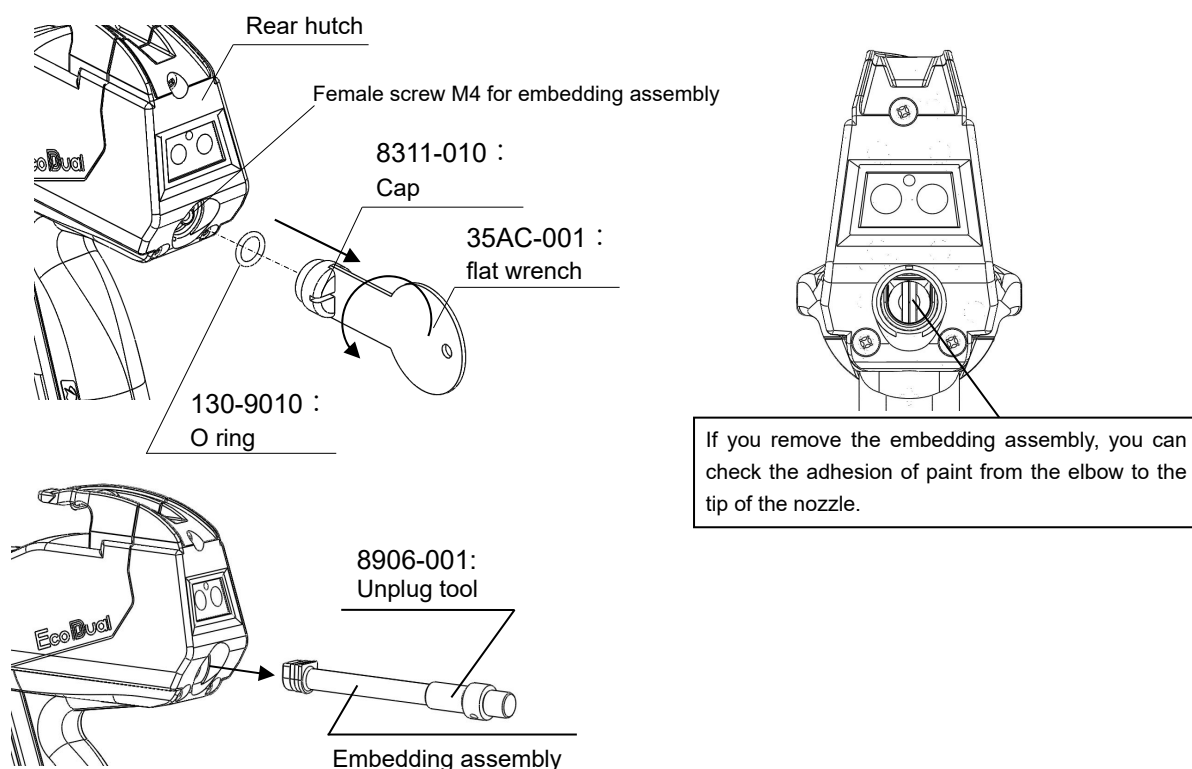
6.2 Maintenance of hand gun

Perform the following inspections at the end of painting work.

- ① Perform the following inspections at the end of painting work.
- ② Clean the paint adhering to the gun with an air blow or the like.
- ③ For the paint path inside the gun, remove the cap from the rear hatch at the rear of the gun, take out the embedding assembly with the unplug tool of the dedicated attachment / detachment tool, and then blow air.

※The embedding assembly can be taken out by substituting M4 bolts, but it is not recommended because there is a risk of damage.

※To attach or remove the cap, insert a flat wrench or coin into the cross groove and turn it.



WARNING

There is a risk of electric shock.

When inspecting the gun, be sure to turn off the power switch of the electrostatic controller.

WARNING

It may result in personal injury or accident.

- The cable is not only a power supply to the gun, but also a wire for grounding and controlling the gun. If you use it while it is damaged, it may cause a fire or electric shock due to poor grounding.
- Check that there are no bends or scratches.

6.3 Consumable parts

Please prepare spare parts according to the usage situation by referring to the following consumables list rank classification.

Rank	Part No.	Part name	Unit	Page
A	9230-1	DE pad	Gun	26
B	15E1-102	Rear end of holder	Frat muzzle / Round muzzle	9-10
	9219-2	Rear hutch assy	Gun	33
	9222A	Elbow		
C	9220	Grip end assy		
	9221-1	Lower pipe assy		
	9223-1	Hose joint assy		
	8311-006	Gun hook		
	8311-007	Cap nut		
D	130-90125	O-ring	Lower pipe assy	27
	130-9008			
	130-9008	O-ring	Hose joint assy	26
	130-1003	O-ring	Grip end assy	33
	9224-002	Packing	Plug assy	
	130-9010	O-ring	Gun	21

Rank A: Daily replacement parts

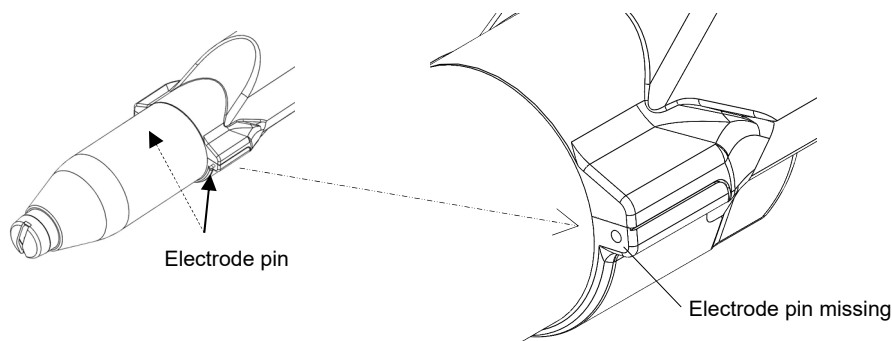
Rank B: Parts that wear out over the medium to long term

Rank C: Parts that may be damaged or lost during use

Rank D: Parts that need to be replaced when disassembled

※Daily replacement: Please check regularly and replace if even just one of the electrode pins is worn out or missing.

※Medium to long term: Depending on the paint, it may wear out in a short period of time, so please check the consumable part regularly.



Depending on the failure situation, multiple phenomena and causes may occur at the same time.

Phenomenon of problem occurrence	Cause	Treatment and countermeasures
Powder paint does not eject	The primary air source is not supplied to the filter regulator.	The original pressure is supplied to the filter regulator.
	Poor connection of the air tube of the primary air source.	Poor connection of the air tube of the primary air source.
	There is little air supplied to the filter regulator.	Set to the range of 0.5MPa (dynamic pressure).
	Filter regulator failure.	Replacing the filter regulator.
	Solenoid valve failure.	Replacing the solenoid valve.
	Poor connection of gun cable.	Hand gun, on the back of the electrostatic controller Insert it firmly into the connector and fix it.
	Defective gun cable.	Replacing the rear hatch assembly or gun cable.
	Poor connection of main or sub air tube.	Insert it firmly into the injector or the joint on the back of the electrostatic controller.
	Poor connection of paint hose.	Insert it firmly into the hose joint of the hand gun or injector.
	Clogged hand gun, powder hose, or injector.	Cleaning or replacing hand guns, powder hoses and injectors.
	Defective electric controller.	Repair or replacement of electrostatic controller.
	Defective hand gun.	Repair or replacement of hand gun.
Discharge pattern or discharge amount is unstable	Nozzle wear.	Replacing the nozzle (flat, reflector). Cleaning or replacement of the rear end of the holder.
	Sticking or wear of the electrode holder.	
	Injector insert sleeve wear.	Replacing insert sleeve.
	Clogged hand gun, powder hose, or injector.	Cleaning or replacing hand guns, powder hoses and injectors.
	The paint is damp or hardened.	Exchange powder paint.
	Poor connection of main or sub air tube.	Insert it firmly into the injector or the joint on the back of the electrostatic controller.
	Poor connection of paint hose.	Insert it firmly into the hose joint of the hand gun or injector.
	Insufficient paint in the paint tank.	Add paint to the paint tank.

Phenomenon of problem occurrence	Cause	Treatment and countermeasures
Discharge pattern cracks	Paint sticks to the nozzle or the electrode of the hand gun.	Cleaning the nozzle or electrode.
	Nozzle wear.	Replacement of nozzle tip and reflector.
Low coating efficiency, poor painting around	Poor earth connection.	Securely attach the ground wire to the electrostatic controller and the painter trolley.
		Securely attach the metal fittings for the ground wire attached to the truck to a D-class grounded booth or a steel structure column with a ground resistance value of 100Ω or less, and ground it.
		Hanger of the object to be coated, peeling of the coating film of the jig, and cleaning.
	The gun voltage is low.	Increase the gun applied voltage (kV) with the electrostatic controller.
	There is a lot of air.	Use the electrostatic controller to reduce the amount of air transported (L / min).
	Hand gun failure (high voltage generator).	Repair or replacement of hand gun.
	Nozzle mounting failure.	Attach the nozzle firmly to the tip of the hand gun and tighten the cap nut firmly.
	Current leakage from the hand gun.	Cleaning, repairing, or replacing the handgun.
	The discharge amount is large.	Use the electrostatic controller to reduce the discharge rate (%).
Poor paint finish	Inappropriate constant current setting.	Set according to the shape of the object to be coated and the coating conditions. ("Flat plate" / "complex" / "repainting" mode)
	The painting distance is close.	Separate the painting distance.
	The gun voltage is high.	Reduce the gun applied voltage (kV) with the electrostatic controller.
	Poor connection of gun cable.	Insert it firmly into the hand gun or the connector on the back of the electrostatic controller and fix it.
	The paint is damp or hard.	Exchange powder paint.

Phenomenon of problem occurrence	Cause	Treatment and countermeasures
[Constant current value] ① Keep 0μA display	Defective gun cable.	Replacing the rear hatch assembly or gun cable.
	Hand gun failure (high voltage generator).	Repair or replacement of hand gun.
	Poor earth connection.	Securely attach the ground wire to the electrostatic controller and the painter trolley.
		Attach the mounting bracket attached to the tip of the ground wire coming out of the painter trolley to a D-class grounded booth or a steel structure pillar with a grounding resistance of 100Ω or less.
		Securely install and ground.
		Hanger of the object to be coated, peeling of the coating film of the jig, and cleaning.
	Defective electric controller.	Repair or replacement of electrostatic controller.
② Does not go up	The set value of the gun current is low.	Change 3 modes or increase the gun current setting value with the electrostatic controller.
	Hand gun failure (high voltage generator).	Repair or replacement of hand gun.
	Poor earth connection.	Securely attach the ground wire to the electrostatic controller and the painter trolley.
		Attach the mounting bracket attached to the tip of the ground wire coming out of the painter trolley to a D-class grounded booth or a steel structure pillar with a grounding resistance of 100Ω or less.
		Securely install and ground.
		Hanger of the object to be coated, peeling of the coating film of the jig, and cleaning.

Follow the procedure below to replace or repair parts.

⚠ WARNING

Unexpected operation of the painting machine may lead to injury or accident to the human body.

When replacing or repairing parts, be sure to turn off the power switch of the electrostatic controller, disconnect the gun cable, drain the paint in the paint path, and clean it.

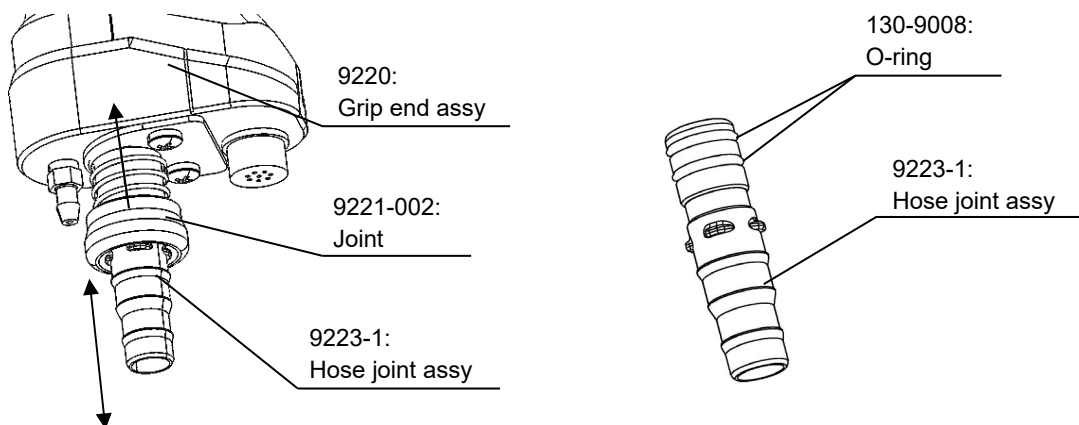
8.1 Nozzle replacement

Refer to Chapter 4, "Preparing to Use the Equipment", 4.3 Installing Nozzles, to remove and replace it.

8.2 Replacement of hose joint assembly

Raise the metal joint of the lower pipe assembly upward and pull out the hose joy assembly. If the O-ring is damaged at this time, replace it.

When installing, raise the joint and insert it until the claws of the lower pipe assembly catch on the hose joint assembly.

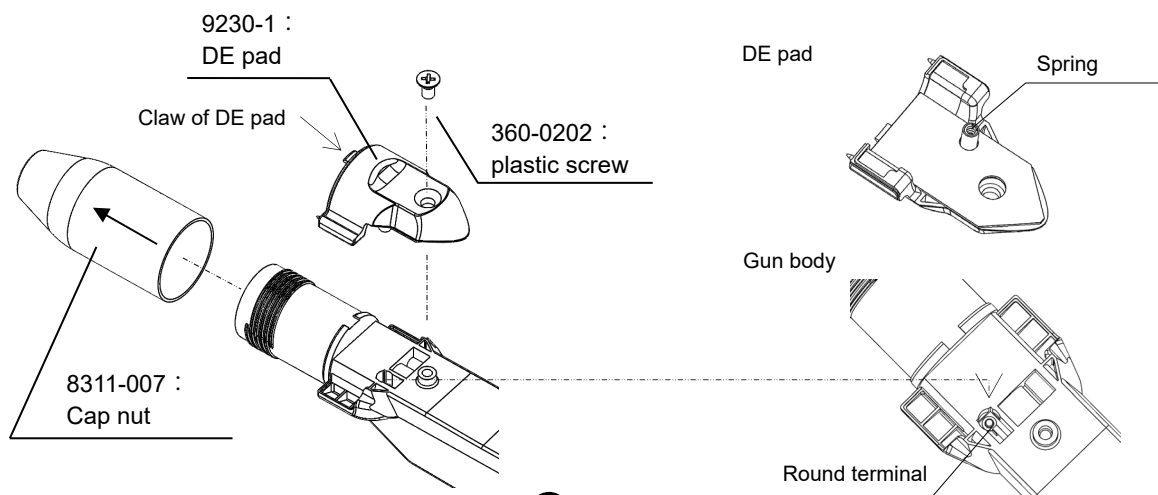


8.3 Replacement of DE Pat assembly

Remove the DE pad from the gun body after removing the cap nut and plastic screw.

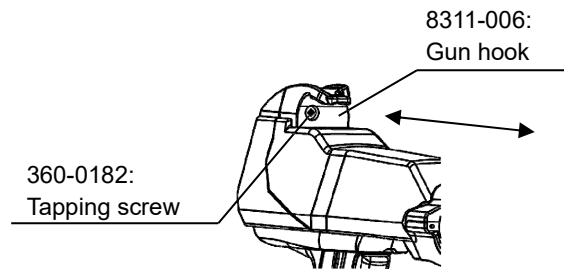
When installing, make sure the DE pad spring touches the round terminal on the gun body.

※The cap nut holds the DE pad's claws.



8.4 Replacement of gun hook

Remove the tapping screw that secures the gun hook before replacing it.



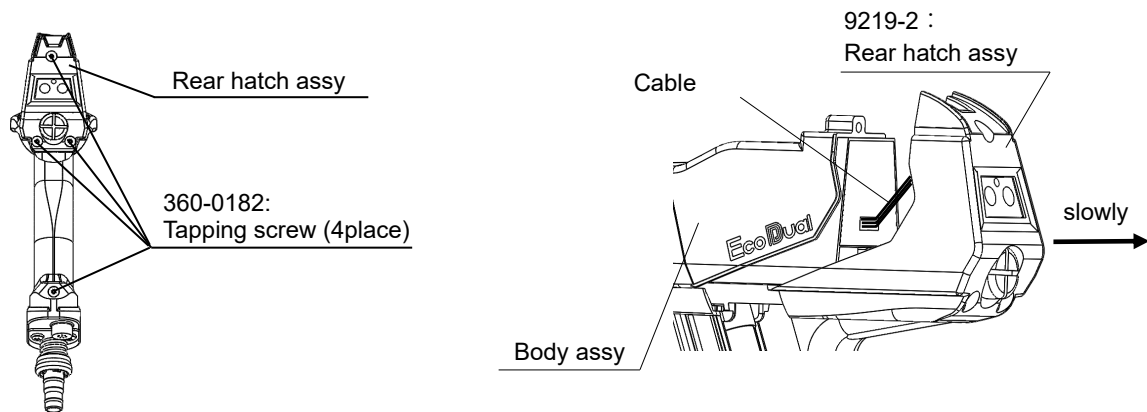
8.5 Disassembly procedure of each assembly

(1) Disassembly of rear hatch assy

- ① With the gun hook removed, remove the tapping screw from the rear hatch assy.

Separate the rear hatch assembly from the body assembly.

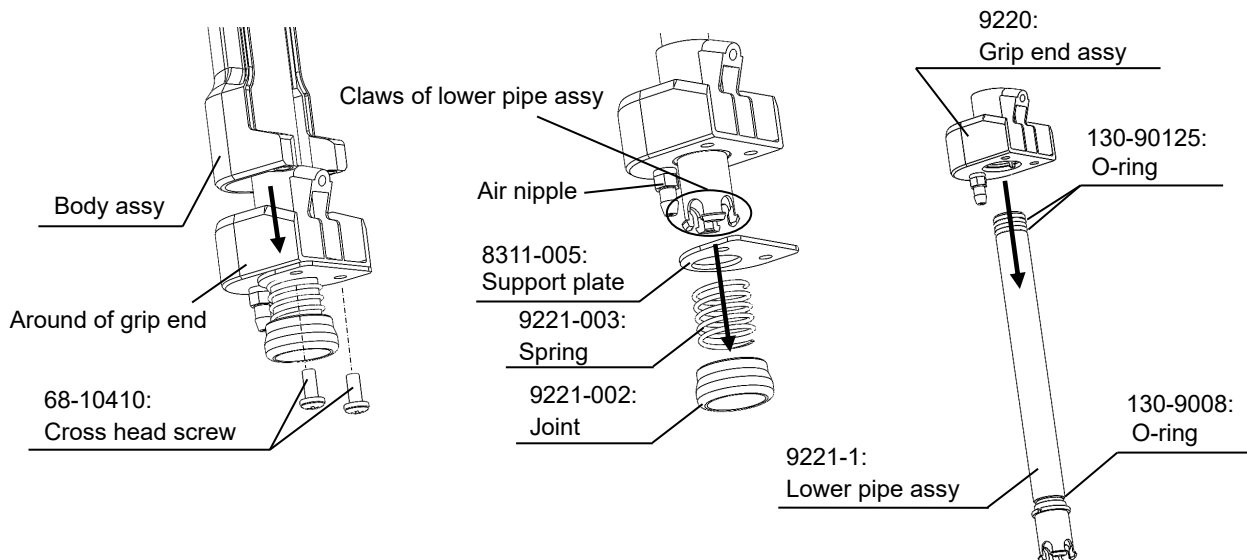
If you pull the rear hatch assy too forcefully at this time, the cable may break, so please pull it away slowly.



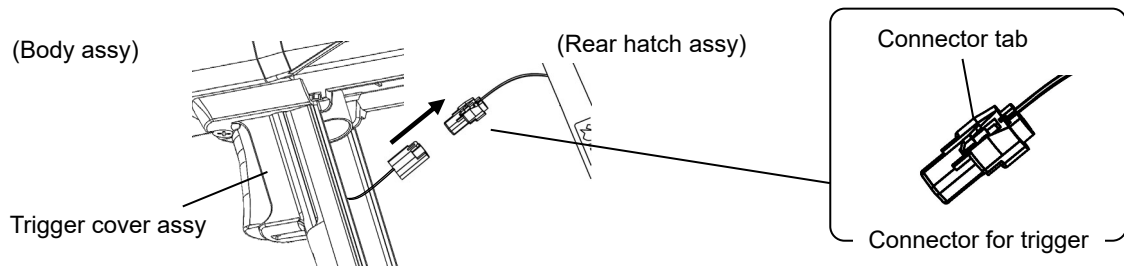
- ② Remove the cross head screw and remove the entire area around the grip end from the body assy.

At this time, be careful not to pull it out too forcefully as the air nipple may break at the neck. Remove the joint, spring, and support plate, being careful not to break the claws of the lower pipe assy.

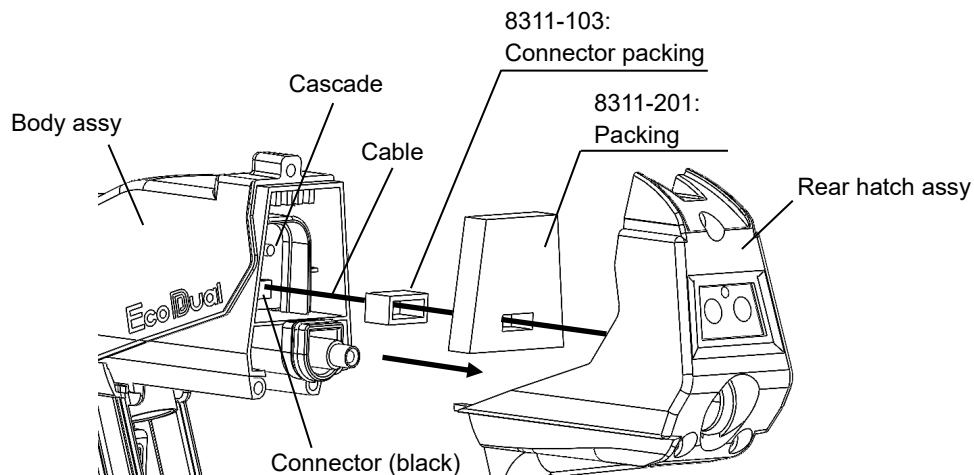
Remove the lower pipe assy from the grip end assy. At this time, if the O-ring of the lower pipe assy is damaged, replace it.



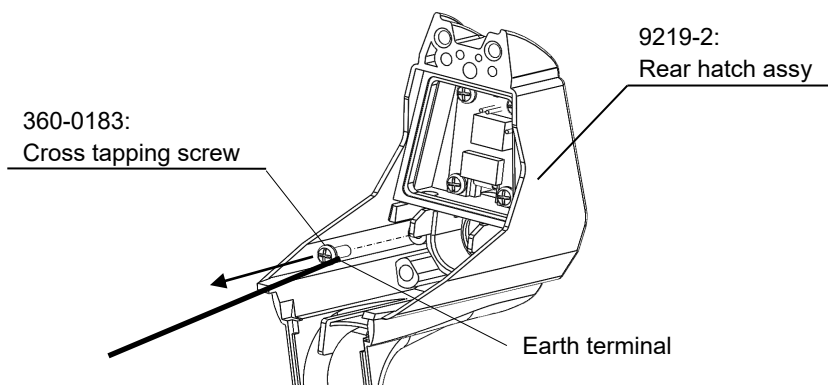
- ③ Remove the trigger connector connecting the rear hatch assy and trigger cover assy.
At this time, be careful not to break the connector tabs.



- ④ Remove the packing and connector packing from the body assy, and remove the connector (black) from the cascade. Pulling the cable forcibly may cause it to break.
Please note that the cascade may fall if the body assy is tilted.
Also, in a powder environment, be careful not to let powder paint enter the cascade chamber.



- ⑤ Remove the cross tapping screw, remove the ground terminal, and separate the rear hatch assy.

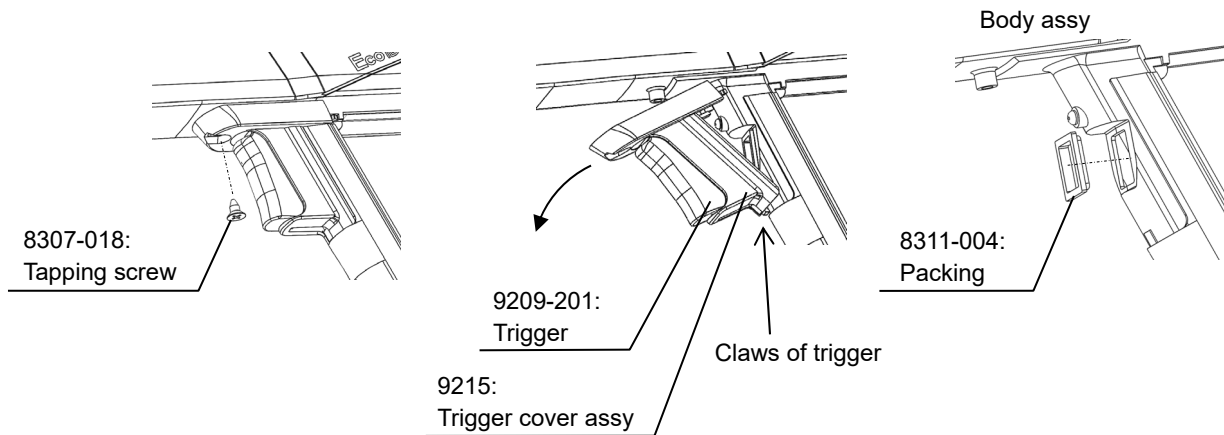


(2) Disassembly of trigger

Remove the tapping screw and remove the trigger cover assy and trigger.

At this time, be careful not to bend the claws of the trigger cover assy.

Remove the packing from the body assy.



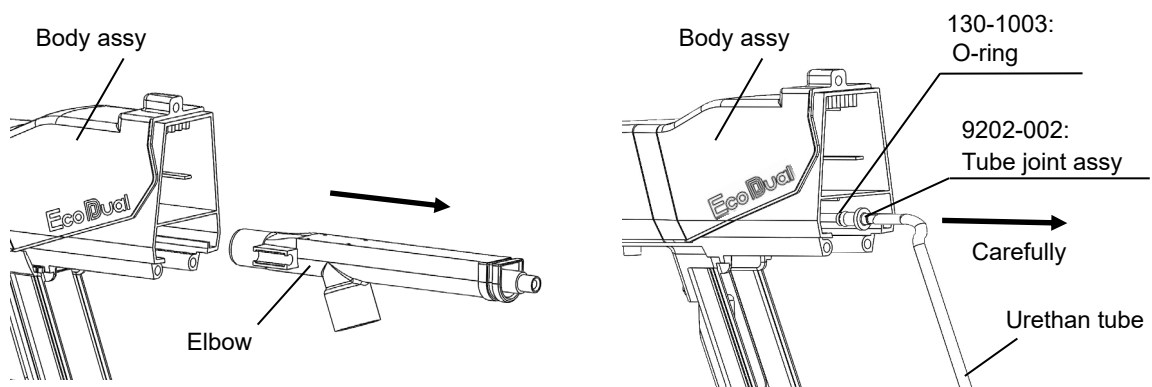
(3) Disassembly of elbow

① Pull out the elbow from the body assy.

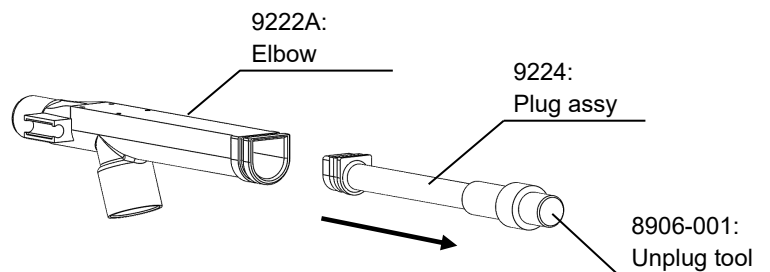
The tube joint assy is press-fitted into the body assy, so please carefully remove it.

Pulling it forcibly may cause injury or damage.

At this time, if the O-ring of the tube joint assy is damaged, replace it.



② Use the unplug tool (special tool) to remove the plug assy from the elbow.



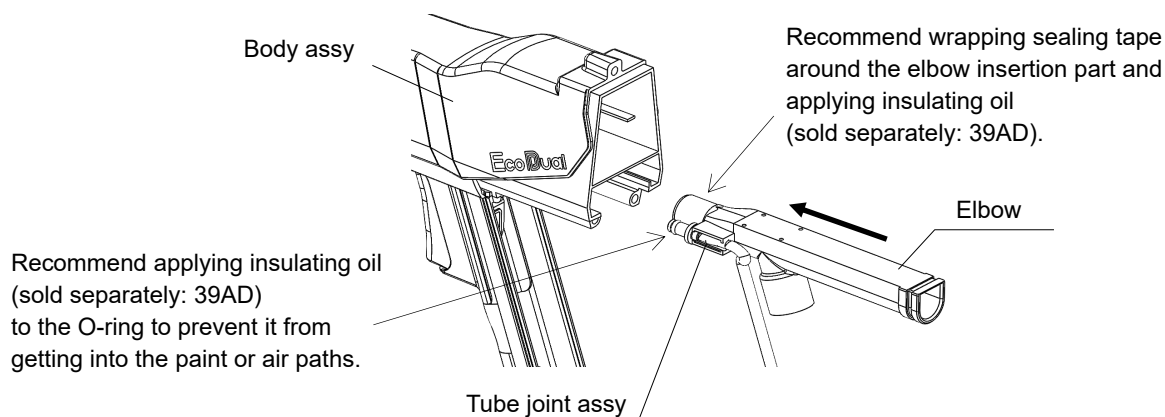
8.6 How to assemble each configuration assy

For assembly, follow the disassembly procedure in reverse order. Please note the following points.

(1) Assembling the elbow

Attach the tube joint assy to the elbow, then insert it into the body assy.

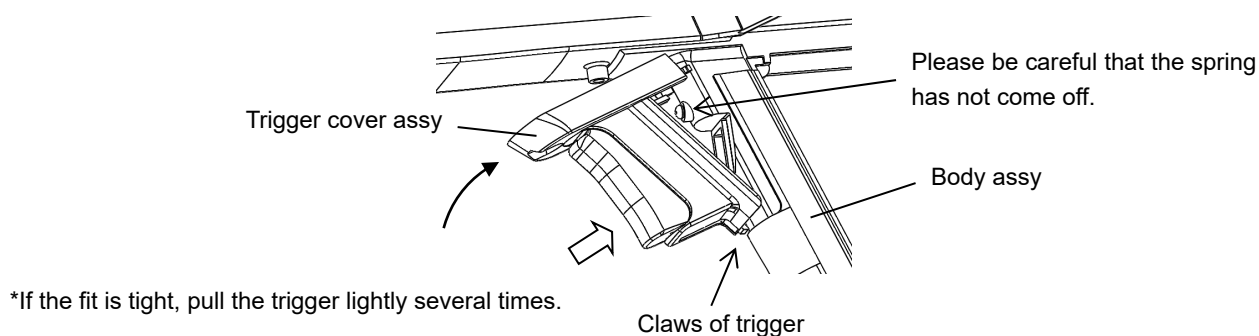
Insert the elbow fully into the body assy. This may cause paint to leak.



(2) Assembling the trigger cover assy

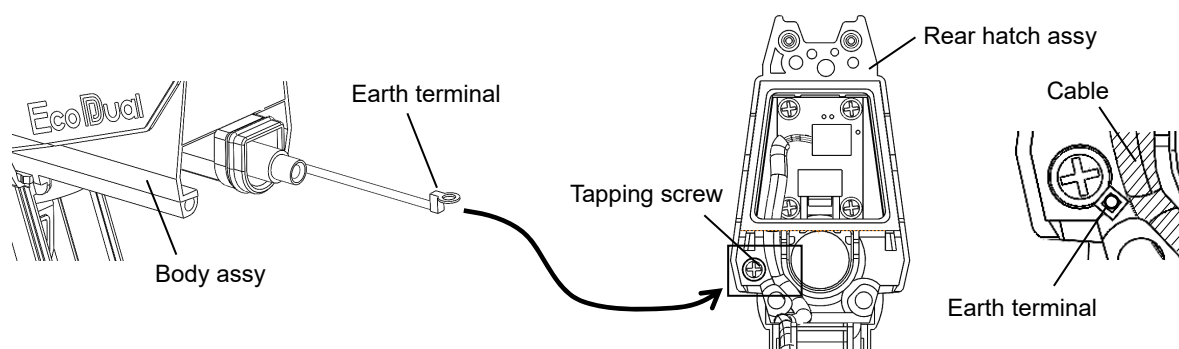
Insert the claw of the trigger cover assy into the body assy, then rotate the claw using the base point to attach it.

Please be careful as not inserting the claw enough may cause damage.



(3) Assembling the earth terminal

Tighten the tapping screws carefully that the ground terminal connected to the body assy does not damage the cable.

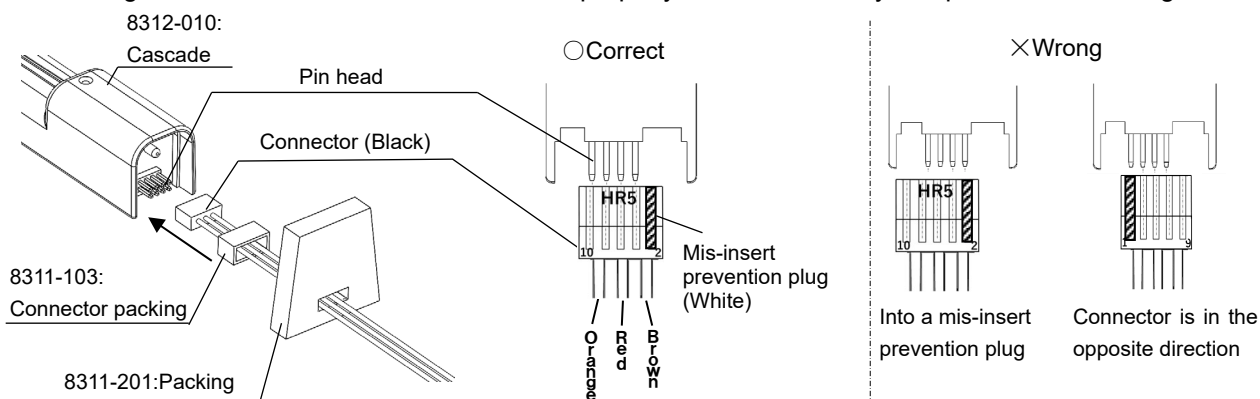


(4) Assembling the connector for cascade



Please note the following when inserting the connector (black) into the cascade.

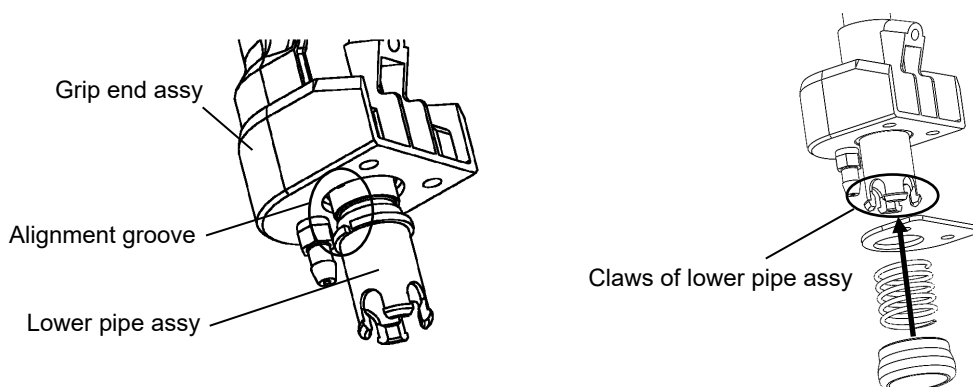
First, pass the packing and connector packing through the connector (black). Hold the connector so that the three wires are on the top (orange, red, and brown from the left), and hold the cascade in the direction shown in the diagram below. Insert 8 pin heads into the 8 holes in the connector that do not have mis-insertion prevention plug, and make sure it inserted all the way to the base. If you insert it in the wrong direction, the device will not function properly. Insert it forcibly, the parts will be damaged.



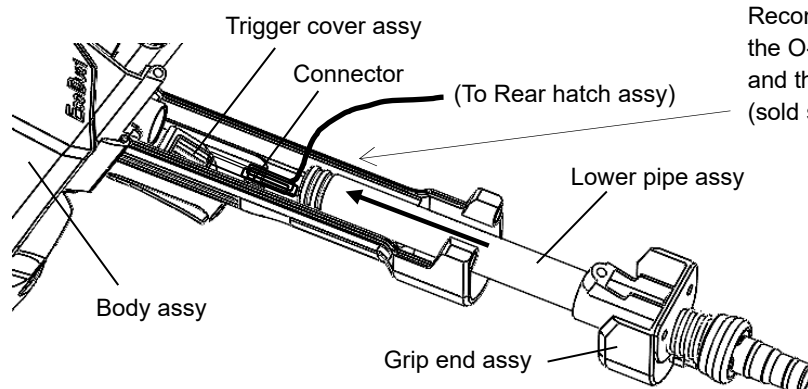
(5) Assembling the lower pipe

Insert that the groove of the lower pipe assy is aligned with the protrusion of the grip end assy.

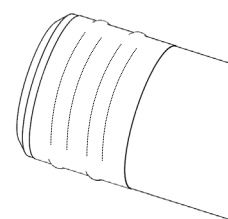
As with disassembly, when assembling joint parts, be careful not to break the claws of the lower pipe assy.



Also, when assembling the lower pipe assy to the body assy, store the trigger cover assy connector between it and the body ASSY.



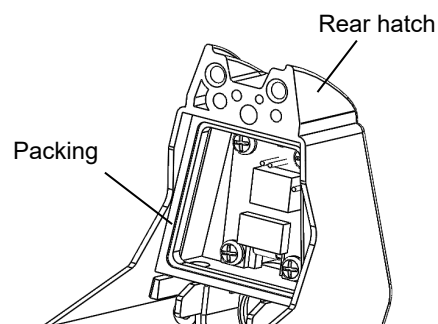
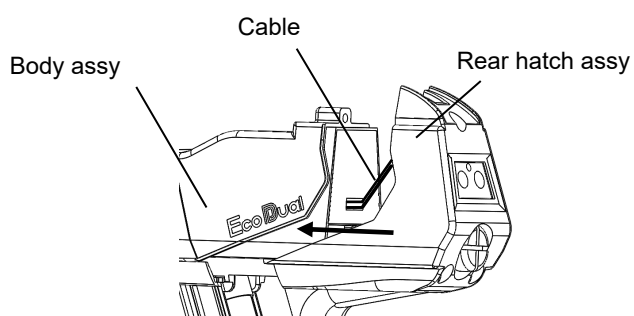
Recommend wrapping sealing tape around the O-ring at the insertion point of the lower pipe and then applying insulating oil (sold separately: 39AD).



Insertion part of lower pipe

(6) Assembling the rear hatch assy

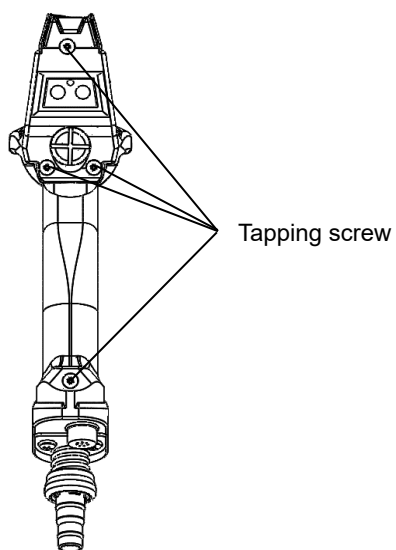
When assembling to the body assy, be careful not to get the cable caught.



When installing the rear hatch assy, make sure that the packing is pressed tightly against the rear hatch with no gaps.

Also, when tightening the tapping screws to the body assy, do not tighten them too strongly.

The screw holes in the body assy are damaged and the tapping screws are loosened when assembled.



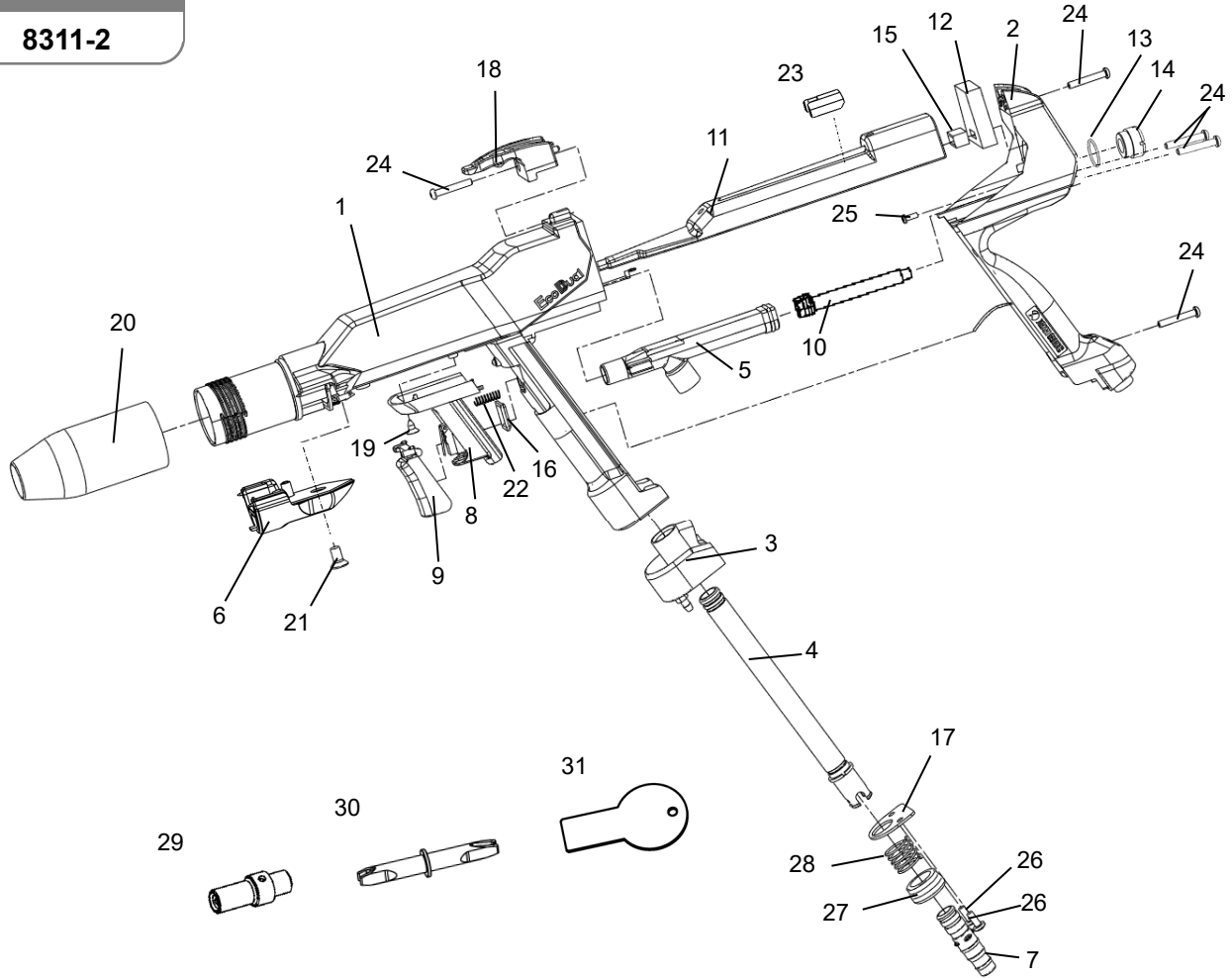
9

Components

9.1 ECDm

ECDm

8311-2



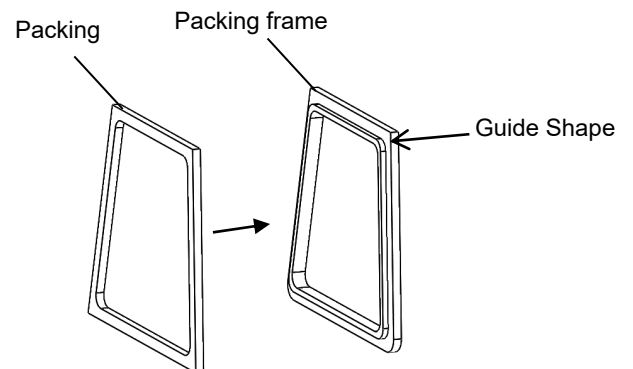
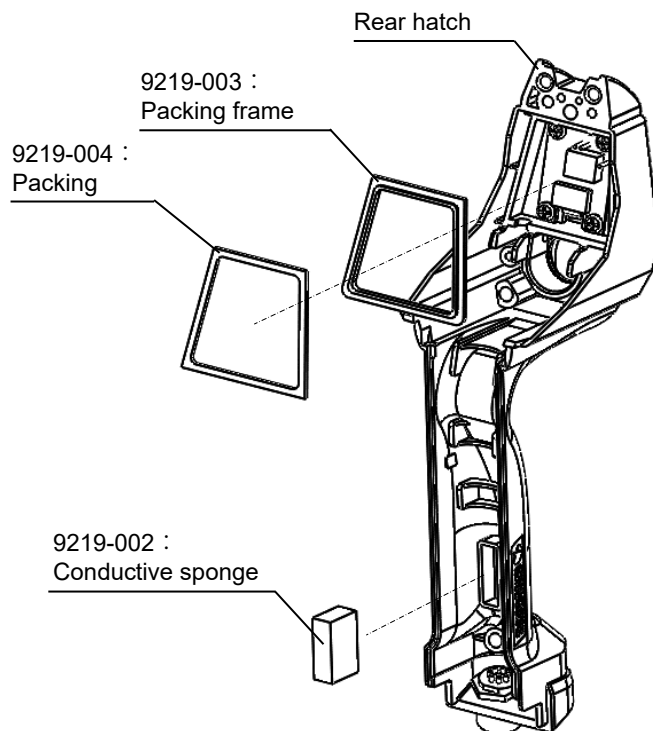
No.	Part No.	Part Name	Q'ty	Remark
1	9218-2	Body assy	1set	
2	9219-2	Rear hatch assy	1set	
3	9220	Grip end assy	1set	
4	9221-1	Lower pipe assy	1set	
5	9222A	Elbow	1	
6	9230-1	DE pad	1set	
7	9223-1	Hose joint assy	1set	
8	9215	Trigger cover assy	1set	
9	9209-201	Trigger	1	
10	9224	Plug assy	1	
11	8312-010	Cascade	1	
12	8311-201	Packing	1	
13	130-9010	O-ring	1	
14	8311-010	Cap	1	
15	8311-103	Connector packing	1	
16	8311-004	Packing	1	

No.	Part No.	Part Name	Q'ty	Remark
17	8311-005	Support plate	1	
18	8311-006	Gun hook	1	
19	8307-018	Tapping screw	1	M4×8L
20	8311-007	Cap nut	1	
21	360-0202	Resin screw	1	M6×12L
22	9202-008	Spring	1	
23	8311-009	Cascade retainer	1	
24	360-0182	Tapping screw	5	4×25
25	360-0183	Cross tapping screw	1	M3×8L
26	68-10410	Cross head screw	2	M4×10L
27	9221-002	Joint	1	
28	9221-003	Spring	1	
29	8906-001	Unplug tool	1	Special tool
30	8906-102	Swap tool	1	Special tool
31	35AC-001	Plate spanner	1	Special tool

9.2 Each configuration ASSY

Rear hatch assy

9219-2

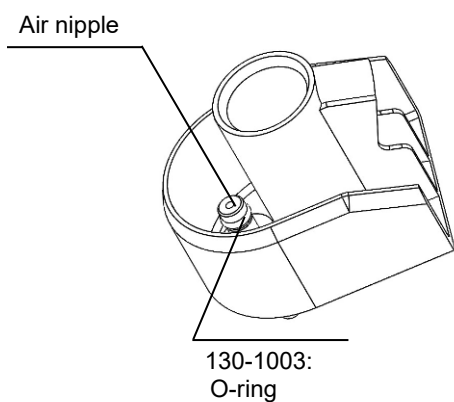


Peel off the double-sided tape from the packing and attach it to the packing frame according to the alignment guide shape.

When inserting the integrated packing into the rear hatch, make sure to push it firmly against the rear hatch without any gaps.

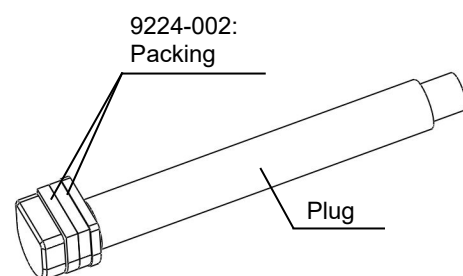
Grip end assy

9220



Plug assy

9224



Maintenance Log

Please use record the details that you conduct a maintenance service, such as replacement of a part, tear-down cleaning, post-failure repair, etc.

[illegible]

Note: Due to continuous improvements and modifications, the configurations specified herein are subject to change without prior notice.

ASAHI SUNAC CORPORATION (the “Company”) shall provide the original purchaser (the “Purchaser”) with warranty service for a period of one (1) year from the date of purchase of the product, as follows:

- Should you find defects in design or workmanship with regard to parts, ship them back to the Company, with freight prepaid. The Company shall repair or replace the parts free of charge and reimburse the freight charges, provided that, as a result of an inspection and investigation of the parts conducted by the Company, the defects are deemed to be attributable to the factors within the Company’s responsibility.
- In the following cases, free after-sales service is not provided.
 1. Failure resulting from an inappropriate method of installing this equipment.
 2. Failure resulting from a use method not conforming to this instruction manual or mishandling.
 3. Failure resulting from insufficient maintenance management of this equipment and incorrect handling such as non-conformance to the procedures specified in this instruction manual.
 4. Failure resulting from unauthorized alteration or structure change of this equipment without the Company’s consent.
 5. Failure due to force majeure such as earthquake, disaster, flood disaster or lightening.
 6. Warranty for consumables worn or deteriorated even in the case where this equipment is used correctly.
 7. Repair after the machine has been used outside Japan, and shipping cost.
 8. In addition to the above, failure due to circumstances beyond our control.
- As for items such as parts purchased by the Company from another manufacturer, the warranty of that manufacturer shall apply.
- As for any parts deemed to be defective, the Company shall not be held liable for any expenses beyond the provision of repair or replacement parts free of charge.
- The Company shall not be held liable for any damage to the Purchaser caused by factors not attributable to the Company, such as misuse of product, etc.

-
- When a transfer of title of this equipment takes place, please see to it that this Operation and Maintenance Manual is handed over to the new owner.
 - This equipment is manufactured in compliance with the Laws and Regulations of Japan.
In the rare eventuality of this equipment being used outside Japan, compliance with the safety standards of the relevant countries is of course mandatory.
-

17th Edition: July 22, 2026

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