ASAHI SUNAC

Operation

Compact Rotary Atomizing Electrostatic Automatic Coating Gun

NC Bell

ESA100

Ec'Coater™ エコーター

This manual contains important information on warnings and cautions.
Read the manual thoroughly before starting to operate the equipment, and follow the instructions.
Always keep the manual handy until such time as the equipment is no longer being used.
If your manual is lost or worn badly, do not hesitate to contact our agency which is closest to you, or the ASAHI SUNAC CORPORATION, directly, and ask us to send you a new one.

15th Edition: June 25, 2025

Introduction

Thank you for purchasing our product Compact Rotary Atomizing Electrostatic Automatic Coating Gun, NC Bell < ESA100>.

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 (BPS260).
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.

Contents

1 For safe and correct use ····· 1
2 Equipment Overview ····· 7
3 Specification ····· 7
4 Components ····· 8
5 Installation and Connections ····· 12
6 Handling the Main Body ····· 16
7 Maintenance ····· 23
8 Paint Problems and Solutions ····· 25
9 Troubleshooting ····· 27
10 Parts Replacement Procedure and Adjustments · 29
11 Maintenance Log ····· 32
12 Warranty ····· 33

15th Edition: June 25, 2025

1 For safe and correct use

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 an automatic spray gun designed to be installed in the coating booth equipped with an exhaust system and used for painting with paint adjusted for rotary atomization electrostatic paint.
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 and precautions for safe use》

⚠ 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.

- **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 paint container must be grounded with an earth wire (excluding the insulated stand specifications).**
  The paint path can cause the paint container to become charged, a risk of fire or electric shock.

- **The electrostatic controller must be grounded with an earth wire.**
  Static electricity can cause spark discharge, which can result in fire or electric shock.
  Connect the earth wire with screws or other fasteners to prevent it from coming loose.

《Warning and precautions for safe use》

⚠ WARNING

Fire and explosion

Prevent fire and electric shock caused by faulty earthing

- **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 1kΩ or less for metal (1MΩ or less for resin) (measurement voltage should be 500V or more).

- **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 and precautions for safe use》

⚠ 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 approach and touch the gun body 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

- **Clean the coating room and exhaust device (ducts and fans) regularly.**
  If the exhaust device does not function properly, harmful substances may cause serious injury, including inflammation and poisoning.

《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.

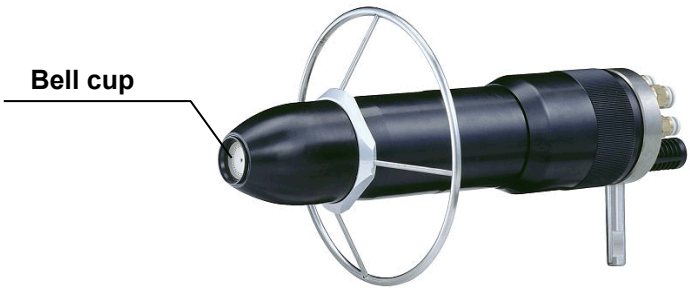
- **Do not immerse the coating machine, connection/extension cable or hoses in cleaning solvent.**
  Electrostatic sprayer are electrical machines, immersing them in cleaning solvents may cause break down.

- **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.

- **Never use a metal brush to clean the sprayer or its components.**
  It may cause scratches, breakdowns, and poor coating results.
  The bell cup and bell cap are important parts of the sprayer.
  If you use a metal brush to scratch it, uniform coating will not be possible.

- **Check frequently for paint leaks, air leaks, and loose screw.**

- **Do not touch the bell cup of the sprayer carelessly.**
  There is a risk of injury if you come into contact with the edge of the bell cup, which is rotating at high speed. Please handle with care.

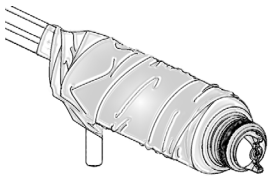


《Warning and precautions for safe use》

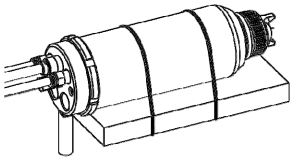
⚠ WARNING

• **Do not install it like following.**

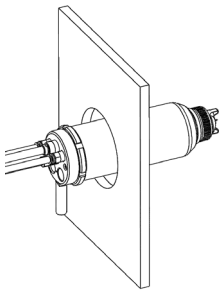
Electrostatic guns apply high voltage to the tip of the gun and the rear is earthed, make sure there are no obstacles on the main body (insulated part).



①If the gun is used with the dirt-proof sheet wrapped around it, moisture will accumulate inside, causing an overcurrent error.



②If a metal plate is attached close to the gun body, insulation breakdown may occur between the charged part of the gun and the plate.



③If the gun body is inserted through a hole in a metal plate, insulation breakdown may occur, just as in ②.

●**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

<<Advantages>>

① Bell Cup self-cleaning function enables to remotely operate the cleaning work.

② Shorter cleaning time and less cleaning waste fluid achieved by excellent cleaning performance of the gun inside the paint route.

③ Easy maintenance as the valve is not built in the gun.

④ The gun body is detachable in its mid part and the back part, which allows easy maintenance.

⑤ The “rotation controller” (optional setting) minimizes rotation fluctuation that is caused by influences of paint discharge loads and maintains setting speed through operations.

3 Specification

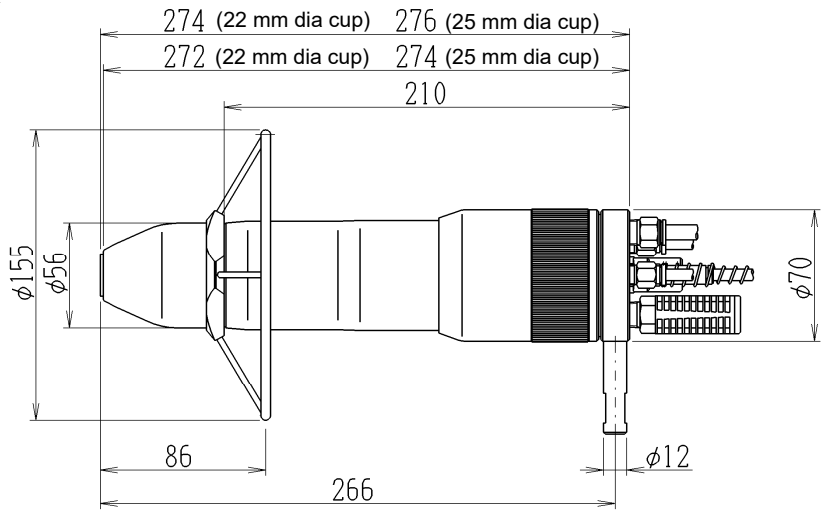


Figure 1 Outside view

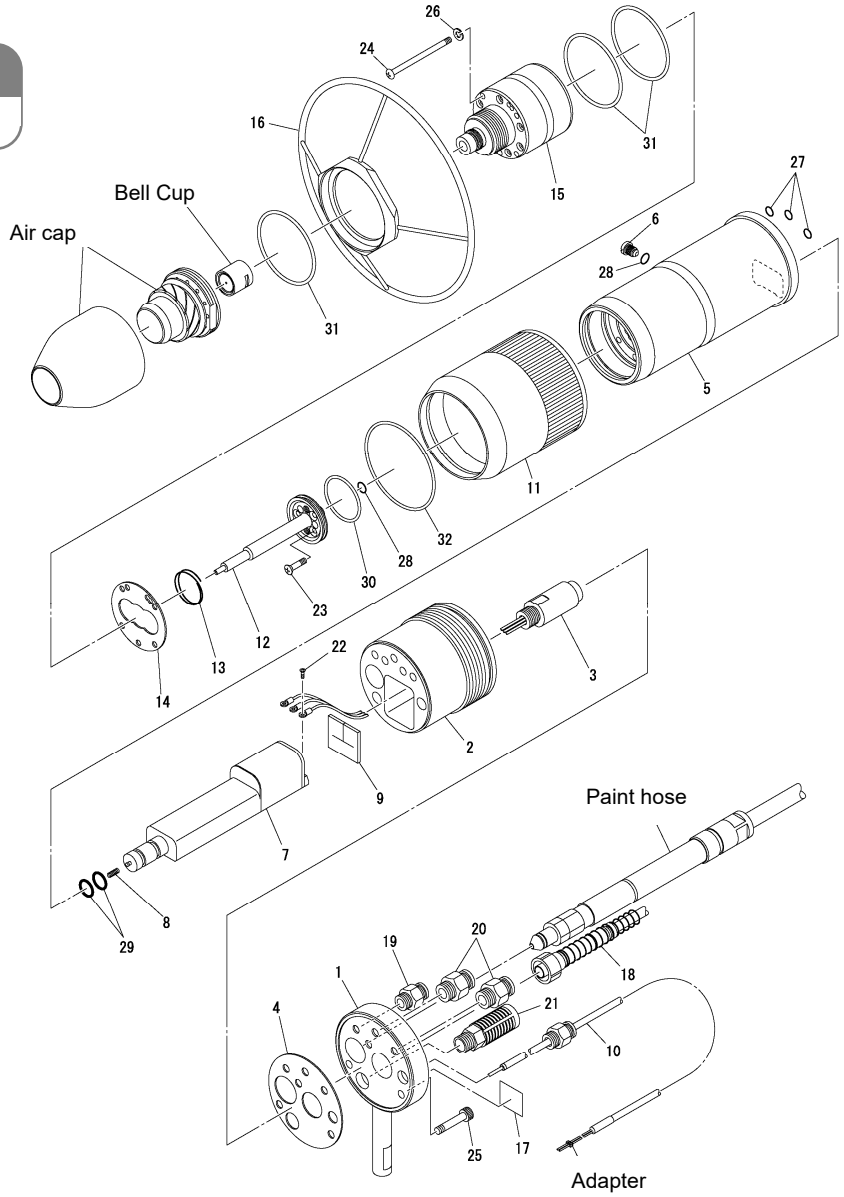
Table 1 Basic specification

Normal turbine speed	70,000 rpm or less (at 22 mm dia cup installation) 60,000 rpm or less (at 25 mm dia cup installation)
Maximum turbine speed	80,000 rpm (at no load with 22 mm dia cup) 70,000 rpm (at no load with 25 mm dia cup)
Bearing air pressure	0.4 MPa or more
Discharge rate	Max. 300 mL/min (at viscosity of 50 mPa･s)
Cleaning thinner discharge rate	500 mL/min or less (However, no air shall be included.)
Air consumption and maximum air pressure	Bearing 50 L/min (ANR) (at 0.5 MPa) Max 0.7 MPa Supply air temperature 0 to 45°C (bearing air only) Turbine 270 L/min (ANR) (at 70,000 rpm) Max 0.7 MPa Shaping 300 L/min (ANR) (at 0.5 MPa) Max 0.7 MPa
Maximum voltage	DC-60kV
Weight	1,400 g

4 Components

ESA100

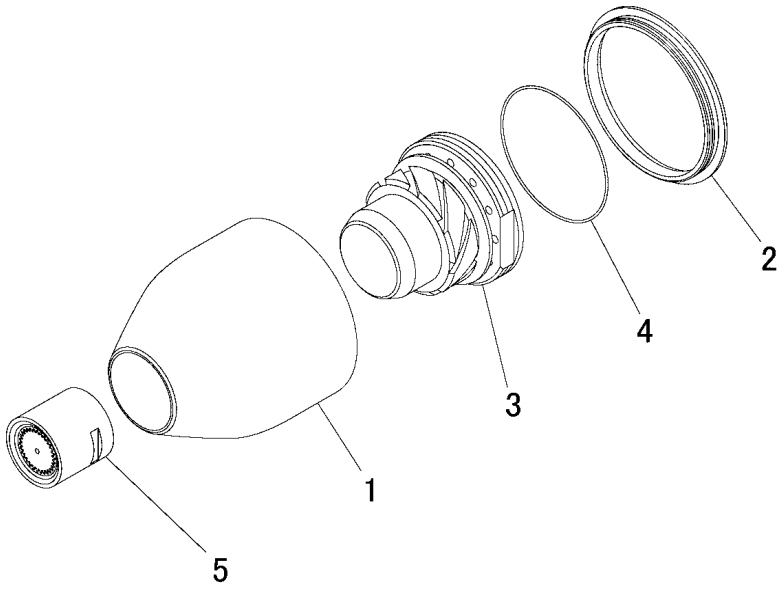
139F



No.	Part No.	Part name	Qty	Remarks
1	139F-001	Base	1 set	
2	139F-002	Block	1	
3	137F-006	Connector	1 set	
4	139F-004	Gasket	1	
5	139F-005	Barrel	1 set	
6	139F-006	Plug	1	
7	145F-007	Cascade	1 set	
8	1285-042	Spring	1	
9	145E-036	Terminal cover	1	
10	139F-010	Sensor	1 set	
11	139F-011	Retainer	1	
12	139F-012	Feed tube	1 set	
13	139F-013	Spring	1	
14	139F-014	Packing	1	
15	321-0015	Spindle	1 set	
16	148E	Counter electrode	1 set	

No.	Part No.	Part name	Qty	Remarks
17	331F-001	Name plate	1	
18	2552	Connection cable	1 set	
19	376-0601	Quick-connect joint	1	
20	376-0802	Quick-connect joint	2	
21	326-0005	Muffler	1	
22	12-10204	2-point sems screw	3	
23	69-10312	Cross-recessed flat-head screw	3	
24	68-10345	Cross-recessed pan-head screw	4	
25	03-50525	Hex. socket bolt	3	
26	41-50300	Spring washer	4	
27	130-2006	O-ring	3	
28	130-7006	O-ring	2	
29	130-7010	O-ring	2	
30	130-6029	O-ring	1	
31	130-9048	O-ring	3	
32	130-9060	O-ring	1	

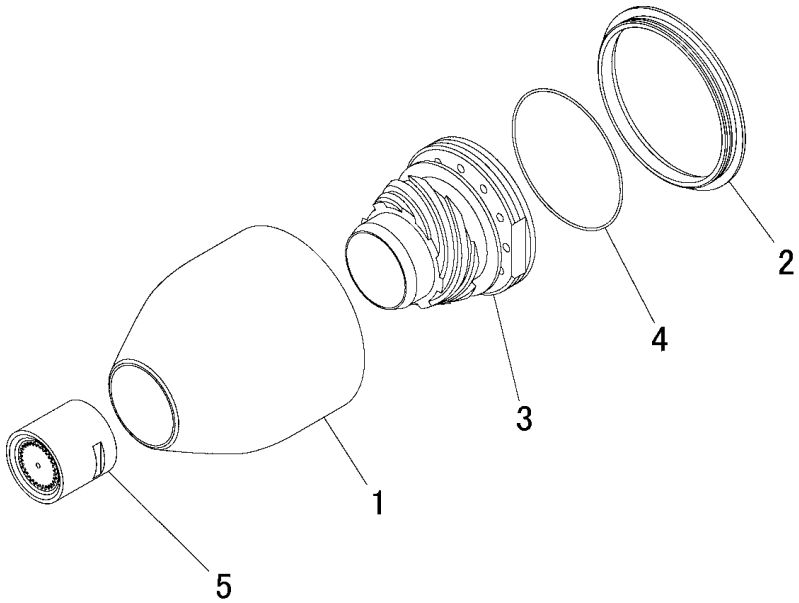
● Combination of 22 mm dia Bell Cup NC22 (156A) with
100 mm dia pattern air cap NC22-10 (156E)



No.	Part No.	Part name	Qty	Remarks
1	156E-001	Cap	1	
2	156E-002	Spacer	1	
3	156E-003	Jet	1	

No.	Part No.	Part name	Qty	Remarks
4	130-9048	O-ring	1	
5	156A	22 mm diameter Bell Cup	1	

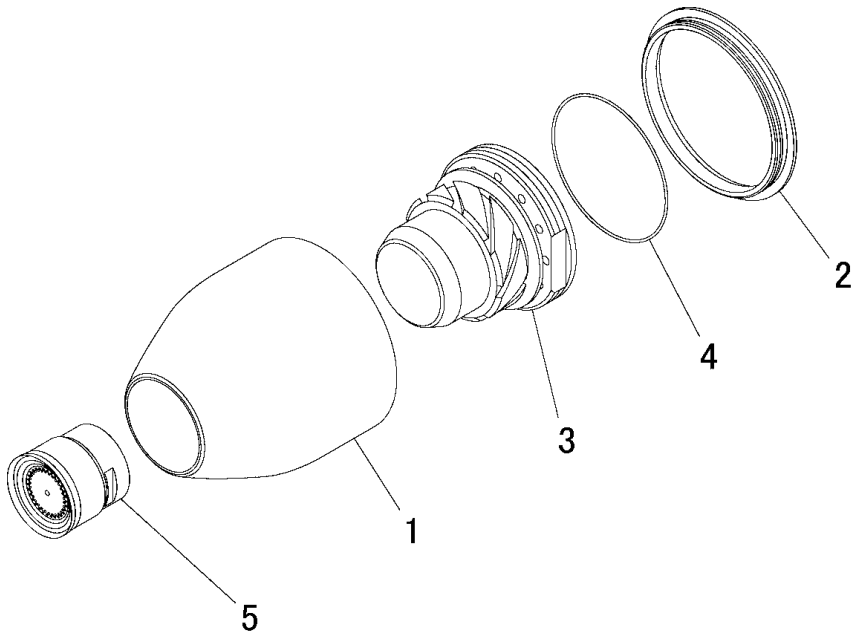
● Combination of 22 mm diameter Bell Cup NC22 (156A) with
200 mm diameter pattern air cap NC22-20 (156F)



No.	Part No.	Part name	Qty	Remarks
1	156F-001	Cap	1	
2	156E-002	Spacer	1	
3	156F-003	Jet	1	

No.	Part No.	Part name	Qty	Remarks
4	130-9048	O-ring	1	
5	156A	22 mm diameter Bell Cup	1	

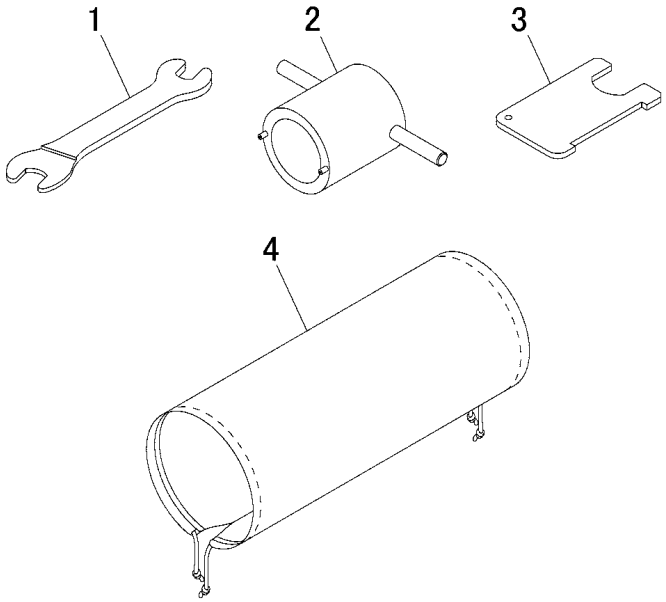
● Combination of 25 mm diameter Bell cup NC25 (156C) with
150 mm diameter pattern air cap NC25-15 (157A)



No.	Part No.	Part name	Qty	Remarks
1	157A-001	Cap	1	
2	156E-002	Spacer	1	
3	157A-003	Jet	1	

No.	Part No.	Part name	Qty	Remarks
4	130-9048	O-ring	1	
5	156C	25 mm diameter Bell Cup	1	

● Accessory tools (357E)

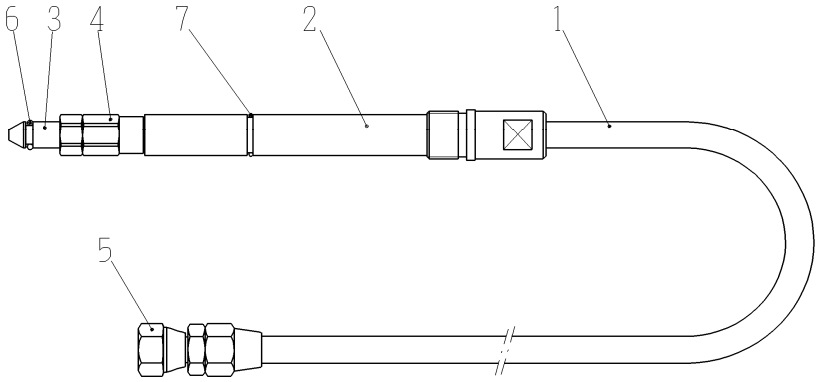


No.	Part No.	Part name	Qty	Remarks
1	357E-001	Bell removable tool	1	
2	357E-002	Air cap mounting tool	1	

No.	Part No.	Part name	Qty	Remarks
3	355E-001	Flat spanner	1	
4	3591-026	Hose cover	1	

● Paint hose with metal hose-end connector

1 m (3454) / 5 m (3454-1) / 10 m (3454-2)

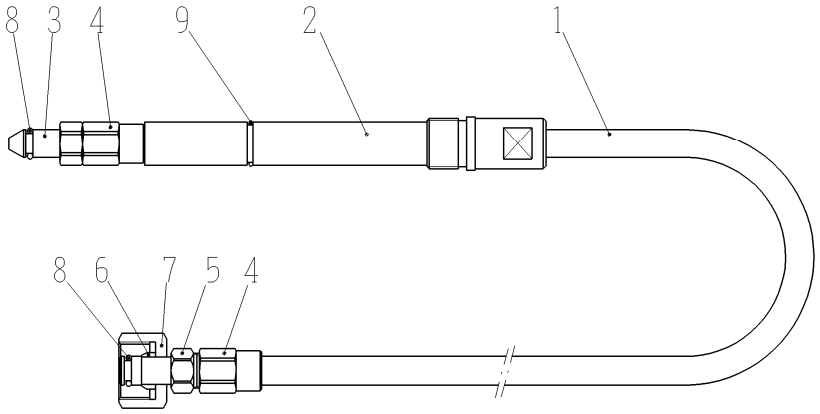


No.	Part No.	Part name	Qty	Remarks
1	558-0010	Double-layer tube	1	1 m
	558-0050	Double-layer tube	1	5 m
	558-0100	Double-layer tube	1	10 m
2	3454-002	Sleeve	1	
3	3401-001	Nipple	1	

No.	Part No.	Part name	Qty	Remarks
4	3401-002	Nut	1	
5	3438	Hose end connector	1	
6	101-9007	O-ring	1	
7	130-90125	O-ring	1	

● Paint hose with plastic hose end connector

1 m (3455) / 5 m (3455-1) / 10 m (3455-2)



No.	Part No.	Part name	Qty	Remarks
1	558-0010	Double-layer tube	1	1 m
	558-0050	Double-layer tube	1	5 m
	558-0100	Double-layer tube	1	10 m
2	3454-002	Sleeve	1	
3	3401-001	Nipple	1	
4	3401-002	Nut	2	

No.	Part No.	Part name	Qty	Remarks
5	3404-001	Hose end connector	1	
6	3404-013	Sleeve (A)	1	
7	3414-003	Cap nut	1	
8	101-9007	O-ring	2	
9	130-90125	O-ring	1	

5 Installation and Connections

① Installation of the main body

The general installation system diagram of the coating machine is shown in Figure 2.

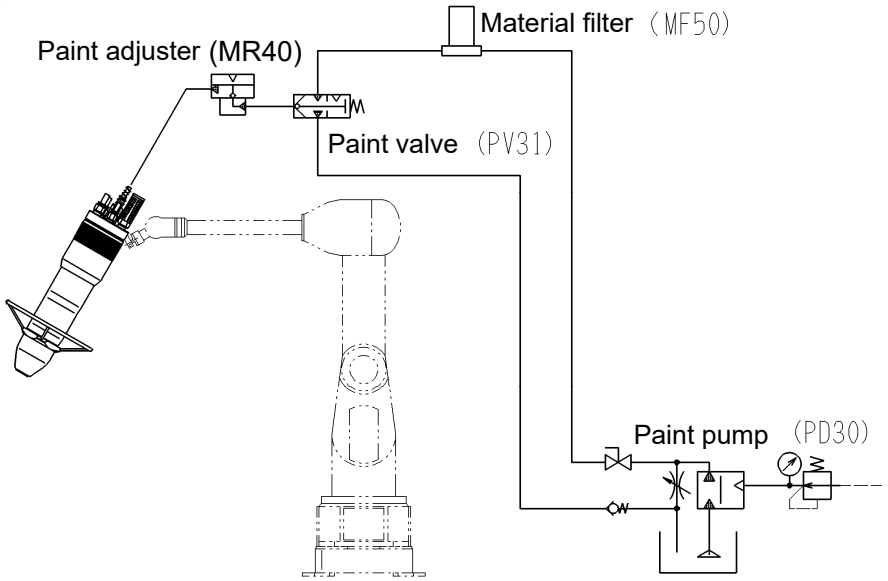


Figure 2 Installation system diagram

⚠ CAUTION

Lay out a paint route and a valve in the structure where it does not cause a temporary rise of the paint discharge rate at the paint valve opening and closing. That may not only result in a paint problem but also a damage in the turbine shaft as thinner spills from Bell Cup.

(1) Fasten the gun securely to the reciprocator arm, stationary stand or others.
(2) Make sure to select an installation location where the gun tip is kept at least 600 mm away from the nearest grounded object in the paint booth, such as water tank or conveyor rail.
(3) For the reciprocator, set 40 m/min or less for the reciprocator speed.
Otherwise, not only does it deteriorate the paint transfer, also it may cause a paint deposit or damage on the reciprocator or the gun body.
Please set the acceleration level applied on the gun to 0.3 G or less if it is installed on an automated device.
(4) Keep the gun installation angle between directly below and the horizontal position. If it is installed higher than the horizontal position, the turbine may be damaged after paint spills out of the cup and enters inside the turbine.
(5) Do not increase the paint discharge rate slowly through the control at spray start.
It may cause burning as paint travels through the feed tube and enters inside the turbine.

② Air route connections

(1) Bearing air

NC Bell uses a precision air bearing that supports the turbine shaft in a lifted position with air pressure. If oil, water, chip sealing tape or another foreign object is included and used for the bearing, it may cause not only significantly a shorter bearing life but also a failure.
The following cautions shall be strictly observed.

① Set up the air dryer process for bearing air of the air bearing. In addition, use the air after fully removing oil, water, or dust.
② Be sure to install a micro mist separator on each gun on the air bearing.
③ Install this micro mist separator as close to the gun as possible (10 m or less).
④ When installing a downstream air route after the micro mist separator, take caution not to include a seal tape or liquid seal, etc. into the route.
⑤ Release air from the air route fully and be sure to eject dust out of this air route before connecting to the gun.
⑥ Supply air to the bearing all time except for maintenance. The shaft sticks at supply stop due to a small amount of impurity of some air quality, which may result turbine seizure.

(2) Other air routes

The air supply to the gun should be arranged in accordance with the following table to ensure enough air quantity and pressure.

Item	Role	Requirement	Tube
(1) Bearing air	Supports the high-speed rotary bearing.	50 L/min (ANR) (0.4 MPa or more)	φ6 × 4∗ (at 10 m)
(2) Turbine air	High-speed rotary drive of the bearing.	220 L/min (ANR) (at 0.5 MPa)	φ8 × 6∗ (at 10 m)
(3) Shaping air	Atomization pattern adjustment.	300 L/min (ANR) (at 0.5 MPa)	φ8 × 6∗ (at 10 m)

* If the tube length is over 10 m, the tube diameters need to be thick all the way to the immediate proximity to the gun.

⚠ CAUTION

Use of low pressure of bearing air supply or poor quality air with oil, water, or foreign object inclusion leads to an accident caused by motor rotation problems such as orifice clogging of the bearing or shaft galling. That results in abrasion and damage on the shaft or/and the bearing inside the turbo motor. Replace and clean the filter element periodically to keep clean air all time. Faulty turbo motor is not subject our guarantee if it is due to insufficient air quality management.

⚠ CAUTION

Be sure to check that bearing air pressure is maintained at 0.4 MPa or more all time.
Sufficient air supply amounts need to be secured. If not, it may result in air bearing burning.
Do not increase the air pressure to 0.7 MPa or more.

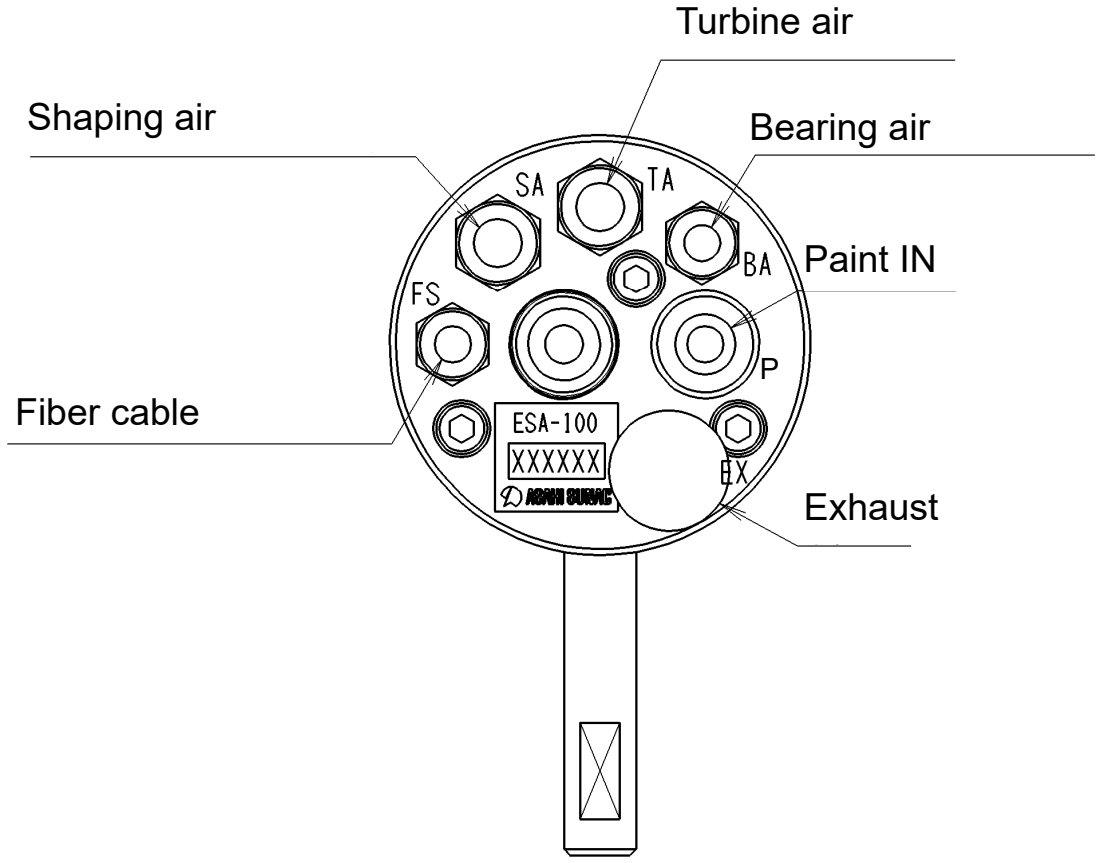


Figure 3 Connection points of air routes

③ Connection of paint routes

An ON/OFF valve for paint is not built in NC Bell. Please prepare separately if an ON/OFF valve for paint is needed.

Connect paint hoses to the main unit of NC Bell via paint pipe routes such as paint pump, paint regulator, or color changing valve.

⚠ CAUTION

Install a regulator, etc. in the thinner route to keep the thinner discharge rate at not more than 500 mL/min at thinner cleaning and prevent damages on the turbine shaft from thinner spill out of Bell Cup.

To adjust the paint hose length, loosen sleeves that fix the paint hose before pulling out. To set it up, check that there is no scratch on the sleeves or O-rings on the nipple at the hose tip.

④ Cable connection

Connect cables to NC Bell. The standard connection cable length is 10 m and can be extended up to 30 m. It can be extended and used up to 30 m in combination of extended cables of 10 m and 20 m.

Part number	Cable type	Length
2552	Connection cable (standard product)	10 m
2549	Extension cable	10 m
2549-1	Extension cable	20 m

The gun will be grounded when it is connected with the cable. Be sure to use the cables above.

Be sure to apply ground works on the controller as well. The gun will be also grounded with the ground wire line of the controller.

⚠ CAUTION

Use a ground wire line with a thickness of at least 3.5 mm^2 for the high-voltage generator and apply a wiring work that fully secures the line not running over an area where class A grounding is applied.

⚠ CAUTION

The controller is not explosion-proof. Be sure to install outside the explosion-proof zone.

⚠ WARNING

There is a risk of fire or explosion.

Be sure to ground the gun and workpieces.
(1 kΩ for metal and under 1 MΩ for resin)
For electrostatic paint, a high-voltage electrostatic phenomenon is applied to positively generate static electricity.
If not suitably grounded, electrostatic discharge or sparks may be generated, resulting in fire or explosion.

⑤ Connection of fiber optic cable

The cable is inserted to a green tube installed on NC Bell. The standard cable length is 10 m. It can be replaced to 20 m on custom order.

Please use KEYENCE FS-V21 as the amplifier to connect a fiber cable.

(1) Install the tip of the fiber cable out of the green tube to the amplifier according to the steps below.
1) Open the cover of the amplifier and bring down the fiber fixed lever.
2) Insert an adapter (with two pins out on a square shape) to the tip of the fiber cable.
3) Insert the fiber amplifier firmly into the insertion holes on the side so that it will not be loosened from the adapter.
4) Bring back up the fiber fixed lever.
5) Press the SET button for 3 to 4 seconds while the turbine is rotating.
The rotation indicator will be automatically tuned.
6) Close the cover of the amplifier.

⚠ CAUTION

The amplifier unit of the optical fiber is not explosion-proof.
Be sure to install outside the explosion-proof zone.

⚠ CAUTION

Take caution not to bend the optical fiber.
Also, use amplifier cords with a cross section area of 0.3 mm^2 or more and length of 100 m or less. Do not lay out at the same wiring with power lines and high-tension lines.

⑥ Cable/hose bundling and cautions

⚠ CAUTION

The next cautions about cable/hose bundling shall be strictly observed for protection of cable strength and prevention from shorter life.

① Do not bundle for approximately 70 cm from the gun. Loosely bundle at intervals of 50 cm or longer after that. If plastic tapes or wide spiral tubes are wrapped up closely to each other, it may cause cable disconnection or hose damage, because that will hold up the wrapped section in the shape of rod and its both ends will be bent.

② Keep some margins in length so that the gun will not be pulled when the reciprocator or the robot is installed. If the cables/hoses are repeatedly pulled with strong force, that may cause cable disconnection and hose damage.

③ Do not step on the cables/hoses during the paint work.
This may cause disconnection especially when they are stepped on the top of metal duckboards.

④ Do not dip in a solvent for a long time. Strength or service life of the cables/hoses will extremely deteriorate.

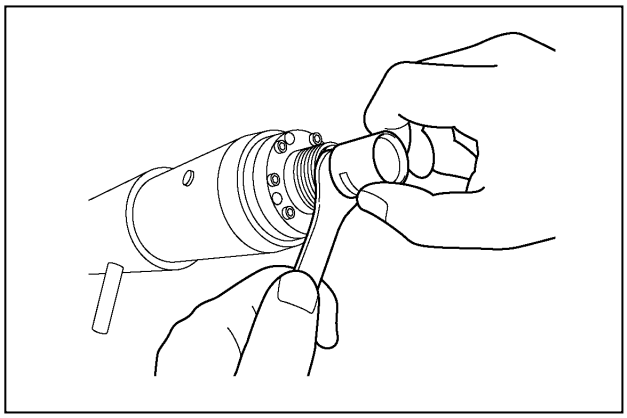
⑤ Do not use metal band to bundle. The metal may be electrically charged.

① Removing Bell Cup and air cap

(1) Mounting and removing Bell Cup

1) Mounting Bell Cup

Fit a flat spanner to the width across flat of the spindle and fix the shaft from rotation. Fasten Bell Cup manually.



⚠ CAUTION

Mount or remove Bell Cup while bearing air is supplied.
Fasten manually, instead of a spanner, when mounting. Fastening strongly with a spanner may cause a paint problem as Bell Cup is deformed.

⚠ CAUTION

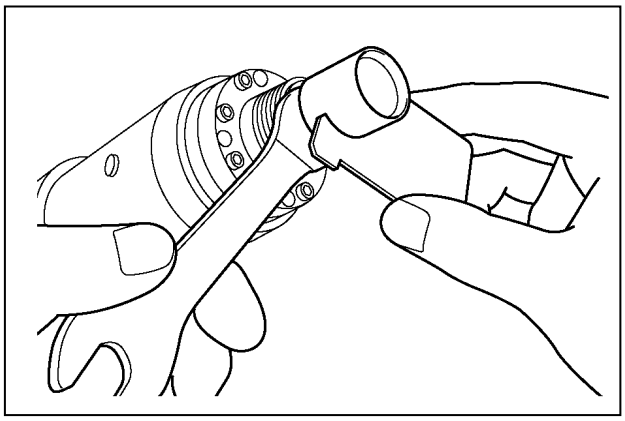
Check that no paint is attached on screws of Bell Cup and the fitting section before installing them. If they are installed with paint attached, Bell Cup rotates out of balance, which may cause air bearing burning.

⚠ CAUTION

Install after checking that paint holes of Bell Cup are not clogged.
If they are installed with clogging, it may cause not also paint problems but also bearing burning, because paint spills from Bell Cup and enters inside the spindle.

2) Removing Bell Cup

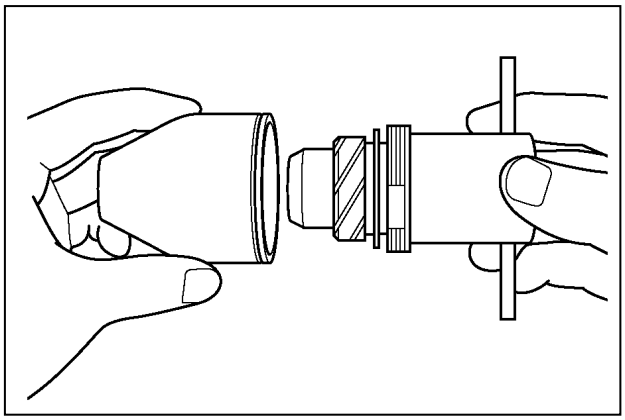
Fit a flat spanner to the width across flat of the spindle and Bell Cup. Loosen Bell Cup while stopping the shaft from rotating.



(2) Mounting and removing the shaping caps

1) Mounting the shaping caps

Fit a jet to the air cap and fasten with a special tool.



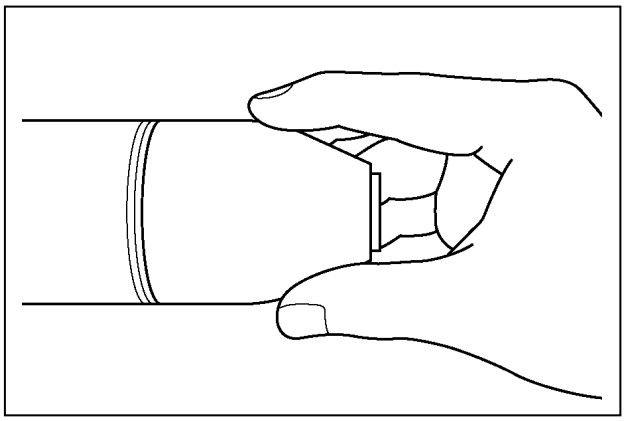
⚠ CAUTION

Do not change the combination of an air cap and a jet. Moreover, the air caps and the jets are available in a small diameter pattern and a medium diameter pattern. Wrong combination causes a scratch on the slip of the air jet section at fastening, which may change the pattern and thus cause a paint problem.

2) Mounting the shaping cap

Fit an O-ring to the air cap and set them on the gun.

Do not fasten tightly. Return for approximately 1 cm after fastening.

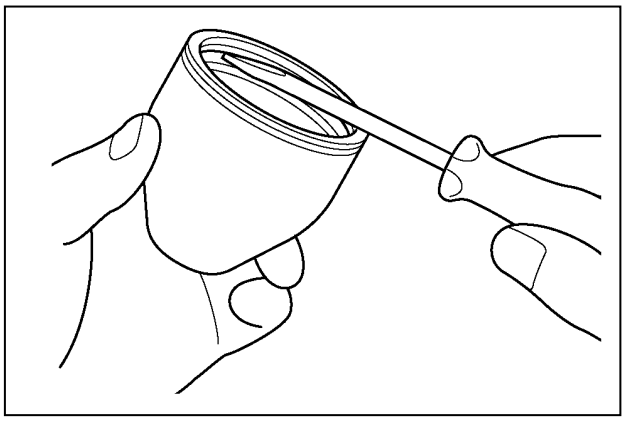


⚠ CAUTION

Do not fasten the air cap tightly on the gun. It may change the pattern. Moreover, the air caps and the jets are available in a small diameter pattern and a medium diameter pattern. Wrong combination causes a scratch on the slip of the air jet section at fastening, which may change the pattern and thus cause a paint problem.

3) Use of counter electrode

Insert a flat-ended driver, pry with it into a gap and remove a spacer fitted in the air caps. Fit a counter electrode on the shaping cap side and mount.



② **Paint preparation**

This system enables to apply electrostatic paint with general synthetic resin paint.

However, it may not be enabled with two-component paint with quick hardening reaction, air drying paint, UV paint, or the paint with high body pigments. Please consult us prior to your use.

In addition, effects of electrostatic paint may not be expected from some of paints of which electrical resistance is either extremely low or high. Check paint resistant values with a paint ohm meter.

If the paint resistance value is adjusted between 10 to 100 MΩ･cm as guideline, high effects of electrostatic paint is expected.

⚠ CAUTION

- **To see effects of electrostatic paint, paint from front with a φ20 to 30 mm steel pipe grounded. If the back side is also painted, it proves a good effect.**
- **For metallic paints or other conductive paints with extremely low electric resistance values, use an insulation stand to insulate the pump unit and the paint route so that it can bring out the electrostatic effect.**

⚠ WARNING

There is a risk of breathing problems or organic solvent poisoning.

- **Some types of substances contained in the paint or solvent do harm if inhaled or brought into contact with your skin. See instructions of the material safety data sheet provided by a paint/solvent manufacturer.**
- **Work in a place well ventilated to prevent the accumulation of such harmful substances.**

③ **Operation method**

Be sure to read respective instruction manuals for the paint feeder including paint squeeze pump and the controller.

(1) Inspection prior to operation

Before starting operations, check that the paint hose, air hose, and cable are fully set up and the paint feeder including paint squeeze pump and the high voltage controller are fully grounded.

⚠ WARNING

There is a risk of fire or explosion.

Be sure to ground the gun and workpieces. (1 kΩ for metal and under 1 MΩ for resin) For electrostatic coating, a high-voltage electrostatic phenomenon is applied to positively generate static electricity. If not suitably grounded, electrostatic discharge or sparks may be generated, resulting in fire or explosion.

(2) Bearing air supply

Supply air after checking that the turbine air switch of the air control panel is “OFF”.

Check that the pressure gauge of bearing air indicates 0.4 to 0.7 MPa.

Rotate the cup lightly with hand and check that it rotates lightly and the shaft is lifted.

⚠ CAUTION

Do not rotate the turbine if the cup does not rotate lightly or rotates but gets stuck during the rotation. Repair the spindle immediately. If the rotation continues, it may cause bearing burning.

(3) Paint supply

Remove Bell Cup and the air cap.

Decrease the regulator of shaping air of the air control panel to 0 MPa and stop shaping air. Check that the power switch of the high pressure generator is “OFF”.

Turn the gun downward and supply paint at the low pressure of 0.1 to 0.2 MPa from the paint squeeze pump.

Open the paint ON/OFF valve and test-blow paint from the tip of the feed tube to drain air from the paint route. Check that there is no leak in the paint route and no leak from the tip of the feed tube when the paint ON/OFF valve is closed.

⚠ CAUTION

Do not use if even slightest paint leak is found from the tip of the feed tube. Paint leak from the feed tube enters inside the spindle, and that may cause bearing burning.

⚠ CAUTION

Turn the gun lower than the horizontal position when paint is discharged. If the gun discharges upward, paint enters inside the spindle, and that may cause bearing burning.
Moreover, set the paint discharge to 300 mL/min or less. Set to 500 mL/min or less even for cleaning with solvent. It spills in the cup and enters inside the spindle, and that may cause bearing burning.

(4) Spray check

Install Bell Cup and the air cap. Increase the regulator of shaping air of the air control panel to approximately 0.4 MPa.

Return the regulator of shaping air of the air control panel to avoid rapidly having high pressure air on the turbine. Then, turn on the turbine air switch to “ON”. Adjust the pressure gauge of the turbine air of the regulator to 0.1 MPa.

Be sure to first check that the cup rotates, then turn the gun obliquely downward and spray paint.

⚠ CAUTION

Note that, if balance of Bell Cup is not in place, that may cause a spindle failure. If Bell Cup or the installing section of the bell with the shaft has paint on, it will be out of balance and cause a spindle failure.

⚠ CAUTION

Be sure to supply bearing air before the spindle rotation starts.
Should the spindle rotation start without bearing air, critical damage will be caused on the bearing. It is recommended that bearing air is supplied all time. If the spindle runs with bearing air pressure of below 0.4 MPa, it causes damage on the bearing, too.

⚠ CAUTION

When paint is discharged from the bell, the turbine should be rotated and shaping air is supplied. At low speed, paint is not discharged from the holes of the bell front due to the centrifugal force. Please well aware that paint runs reversely into a gap between the motor shaft and the feed tube from the rear bell section, and that may be a failure cause. Also, be sure to remove Bell Cup if the discharge rate is measured.

(5) Electrostatic charge

Check that the power lamp of the high-voltage generator is lighted ON.

It is normally coupled with shaping air. When shaping air is sent up, the high voltage lamp is lighted ON. At this point, high voltage is being applied on the tip of the gun.

⚠ WARNING

<u>There is a risk of fire or explosion.</u>
Be sure to shut down static electricity before thinner is released during cleaning, etc.
If a can near the gun is electrically charged, there is a risk of fire or explosion due to static electricity discharging or spark.

(6) Paint work

Please start the paint work.

1) Turbine speed adjustment

The following table shows a relation of the turbine speed with the pressure when a 10 m air hose is used.

The rotation slows down at paint discharge. It also varies depending on paint viscosity. Please use this as guideline. Installation of the “rotation controller” (optional setting) enables to minimize rotation fluctuation that is caused by influences of paint discharge loads and to maintain setting speed through operations.

Turbine air pressure	0.1 MPa	0.16 MPa	0.23 MPa	0.32 MPa	0.46 MPa
Speed at no discharge	20000 r.p.m.	30000	40000	50000	60000
At 200 mL/min discharge	13000 r.p.m.	21000	29000	37000	45000
At 300 mL/min discharge	11000 r.p.m.	18000	25000	32000	39000

With regular painting, the turbine air pressure of 0.2 to 0.3 MPa delivers excellent finish and paint transfer.

At faster speed, paint particles become finer. But the gun becomes unclean and the paint transfer drops as it splashes more paints around. Please adjust according to discharge rates and paint viscosity.

2) Shaping air adjustment

It is adjusted with the regulator of shaping air on the air control panel. With regular painting, the shaping air pressure of 0.3 to 0.4 MPa delivers excellent finish. The adjustment needs to be done while the gun trigger is pulled and air is supplied.

Drawing shaping air down enables to expand patterns but splash is intensified more around and paint particles become rough.

3) High voltage adjustment

It is adjusted with the controller.

High voltage helps to penetrate paint and improve paint transfer. But the gun installing section and the gun become unclean as it splashed more paint deposits around.

In this case, adjust a booth air direction and have it blown towards workpieces while preventing paint particles blown back to the gun.

④ Cleaning at color changing

(1) For cleaning with thinner valve

1) Be sure to turn “OFF” the high voltage power.

2) Set up turbine air of the air control panel to approximately 25,000 rpm.

⚠ CAUTION

Be sure to rotate at approximately 25,000 rpm during cleaning to prevent thinner spill from Bell Cup. If the cup is cleaned without rotation, paint or solvent enters inside the spindle. That may cause bearing burning.

3) Adjust the pressure of shaping air to approximately 0.2 MPa.

4) Open the thinner feed valve and supply thinner to Bell Cup.

5) After stopping the thinner supply as well as the spindle rotation, wash off paint from the sides of the cup and the air cap with a cloth or brush with solvent.

6) Supply the next color.

(2) For cleaning with the paint feeder

1) Start 1), 2), and 3) of the previous section to clean the thinner valve.

2) Start the paint feeder at low pressure to release paint from the paint route to Bell Cup.

⚠ CAUTION

If air is included in the paint route during cleaning, the discharge rate temporarily rises and paint spills out of Bell Cup. Operate the paint feeder slowly for cleaning.
Paint or solvent enters inside the spindle, and that may cause bearing burning.

3) Supply thinner from the paint feeder and supply thinner to Bell Cup.

4) After stopping the thinner supply as well as the spindle rotation, wash off paint from the sides of the cup and the air cap with a cloth or brush with solvent.

5) Rotate the spindle and then eject thinner to supply the next color.

⑤ Finish the work

(1) When pausing or resuming the work within 2 to 3 hours

1) Be sure to turn “OFF” the high voltage power.
2) Decrease pressure of the paint feeder to 0 MPa.
3) Turn “OFF” turbine air of the air control panel to stop rotation. Wash off paint from the cup front and the air cap with a cloth or brush with solvent.
4) Release shaping air and rotate the spindle for another 1 to 2 seconds to eject remaining solvent from the air cap and the cup.

⚠ CAUTION

Turn the gun downward below the horizontal position while cleaning the cup front and the air cap.
If cleaning the gun upward, paint or solvent enters inside the spindle, and that may cause bearing burning.

⚠ CAUTION

Do not spray solvent with the air spray gun when washing the gun. Never clean with the thinner gun. It may cause an air motor stop accident as paint or dust, etc. enters. If cleaning with pressure applied, solvent enters inside the spindle, and that may cause bearing burning.

⚠ CAUTION

Release paint pressure and then turn the gun downward below the horizontal position to stop the gun.
If the gun is turned upward and the paint valve sheet does not properly function due to dust, etc., paint or solvent enters inside the spindle, and that may cause bearing burning.

(2) For 24 hours or longer break from the work

⚠ CAUTION

According to the section, clean every time the work with two-component paint or another chemical reaction system hardening type paint or the paint that likely makes precipitate is interrupted.

1) Be sure to turn “OFF” the high voltage power.
2) Turn “OFF” turbine air of the air control panel to stop rotation.
3) Set the regulator of shaping air of the air control panel to 0 MPa.
4) Remove Bell Cup and the air cap of the gun.
   Wash off paint from the cup and the air cap with a cloth or brush with solvent.
5) Take out an inlet pipe of the paint feeder from the paint container.
   Decrease pressure of the paint feeder and run it at low pressure. The paint feeder will eject from its return side.
6) Draw solvent in from the inlet pipe and eject from the return side of the paint feeder. Repeat cleaning until the pump internal is clean.
7) Open the paint ON/OFF valve to eject paint and solvent from the paint hose. Repeat until it is clean.
8) Stop the drive of the paint feeder and close the paint ON/OFF valve.
9) Install Bell Cup and the air cap.
10) Stop supplying air to the air control panel and fix the gun tip obliquely downward. The work is completed.
11) To start the work, reset the regulator setting of shaping air of the air control panel to the initial state.

⚠ CAUTION

To turn OFF turbine air after work completion, check before stopping the air that Bell Cup rotation completely stops.
If bearing air is shut off with Bell Cup rotating, damage will be caused on the air bearing motor.

7 Maintenance

① About the gun

(1) Keep the gun clean all time. Do not dip the gun into solvent when the entire gun needs to be cleaned. Put solvent on a bristle brush or cloth and clean with care.

⚠ WARNING

There is a risk of electric shock and fire.
Before cleaning, be sure to wait for at least 10 seconds after the power switch of the high-voltage generator is turned OFF.
Check that rotation stops before installing or removing Bell Cup.
Moreover, do not stop Bell Cup with hand while it is rotating.

⚠ CAUTION

Never dip the gun into solvent. Also, putting solvent on the gun unit or spraying to clean may cause bearing burning as solvent enters inside the spindle.

(2) Do not disassemble any section of the gun unless otherwise specified. Please contact us for troubles.

② About Bell Cup and the air cap

(1) Keep Bell Cup and the air cap clean all time.
Do not dip them into solvent for cleaning. Put solvent into a bristle brush or cloth and clean with care.

⚠ CAUTION

Do not use a wire brush to clean Bell Cup and the air cap.
Scratches on Bell Cup and the air cap may deteriorate pattern distributions or shapes.

(2) Do not dip Bell Cup and the air cap in solvent for a long time.
It may be swelled and its service life may be drastically shortened, depending on solvent types.

(3) Dry Bell Cup and the air cap after cleaning.

(4) If you drop or strike Bell Cup, be sure to replace it with a new one.
Dents or scratches may cause air bearing burning as Bell Cup rotates out of balance.

③ About the spindle

(1) Do not disassemble the spindle. The air spindle is made up of high precision parts. Once you take them apart, the spindle may not be able to deliver its original performance.

Also, note that, once disassembled, it is no longer subject to our guarantee.

(2) The turbine shaft keeps on turning for a while on inertia even after the turbine air is turned OFF.

If you touch Bell Cup or the shaft by hand in a case like this, you may get injured.

Be sure to check that Bell Cup and the shaft stop during inspection.

(3) The spindle uses a precision air bearing. Replace the air filter and the micro mist separator that are connected to the air bearing and turbine air regularly.

④ About hoses and cables

(1) Keep the hoses/cables clean all time.

(2) Take caution not to damage with mechanic impacts.

(For example, avoid the situations such as pulling, placing an item on, or driving over with car.)

(3) Do not trail the hoses/cables on the floor.

⚠ WARNING

There is a risk of electric shock or fire.

Never use a damaged cable. Inspect slits, abrasion, swelling, scratches and loose metals over the entire cable length.

If any fault is found, stop using immediately and replace.

(4) The hoses and the cables are consumables. Replace them according to consumed levels.

⚠ CAUTION

Please contact and ask our representative for cable replacement.

8 Paint Problems and Solutions

Multiple faulty phenomena may occur simultaneously, depending on the situation of paint problems.

① Poor spray atomization

Cause	Countermeasure
① Too low shaping air pressure.	① Increase the shaping air pressure.
② Too much paint discharge.	② Decrease the discharge rate or increase atomization air pressure.
③ Too high paint viscosity.	③ Decrease the paint viscosity.
④ Low turbine speed.	④ Increase the turbine speed.
⑤ Scratch on the cup.	⑤ Replace the cup.
⑥ Scratch on the air cap.	⑥ Replace the air cap.
⑦ Not suitable solvent.	⑦ Consult with the paint manufacturer.

② Frequent paint splash

Cause	Countermeasure
① Too high shaping air pressure.	① Decrease the shaping air pressure.
② Too wide for the pattern. (Too low shaping air pressure.)	② Increase the shaping air pressure.
③ Too high paint resistance value.	③ Adjust the paint resistance value higher than the present.
④ Too high turbine speed.	④ Decrease the turbine speed.
⑤ Too long blowing distance.	⑤ Adjust the blowing distance shorter.
⑥ Scratch on the cup.	⑥ Replace the cup.
⑦ Scratch on the air cap.	⑦ Replace the air cap.
⑧ Incomplete grounding of workpieces.	⑧ Ground the product perfectly.
⑨ Low exhaust speed.	⑨ Increase exhaust speed.

③ Poor paint transfer.

Cause	Countermeasure
① Too high shaping air pressure.	① Decrease the shaping air pressure.
② Too wide for the pattern. (Too low shaping air pressure.)	② Increase the shaping air pressure.
③ Too high resistance value of paint.	③ Adjust the paint resistance value within 10 to 100 MΩ･cm.
④ Low applied voltage.	④ Increase the voltage setting of the high-voltage generator.
⑤ High turbine speed.	⑤ Decrease the turbine speed.
⑥ Incomplete grounding of workpieces.	⑥ Ground the product perfectly.
⑦ Too long blowing distance.	⑦ Adjust the blowing distance shorter.
⑧ Too fast exhaust speed of the booth.	⑧ Slow down the exhaust speed.

④ Paint is attached on the side of the cup or the air cap, producing electrostatic paint dirt or thread-like matters on workpieces.

Cause	Countermeasure
① Too quick evaporation of solvent.	① Change to solvent with slower evaporation or adjust with additives.
② High paint viscosity.	② Decrease the paint viscosity.

⑤ Object on paint surface.

Cause	Countermeasure
① Poor spray atomization	① See Section 1 of this chapter, “Poor spray atomization”
② High paint viscosity.	② Decrease the paint viscosity.
③ It is highly dusty in the paint booth. Dust on the paint surface.	③ Set up a dust-proof filter and remove dust in the paint booth.
④ Paint pigment distribution problem.	④ Consider other solvents or filter paints well.

⑥ Orange peel occurs.

Cause	Countermeasure
① High temperature in the paint booth or quick solvent evaporation.	① Adjust the booth temperature or change to the solvent with slower evaporation.
② High workpiece temperature.	② Adjust the drying oven to decrease temperature of workpieces.

⑦ Fish eyes occur.

Cause	Countermeasure
① Insufficient workpiece cleaning.	① Fully clean and degrease.
② Atomization air pollution.	② Inspect the mist separator of the air route.
③ Exhaust problem of the bake oven.	③ Ventilate well.

⑧ Paint dripping on the paint surface.

Cause	Countermeasure
① High applied voltage.	① Decrease the voltage setting of the high-voltage generator.
② Too thick paint film (high paint discharge rate).	② Decrease the paint discharge rate or increase the gun travel speed.
③ Too low paint viscosity.	③ Increase the paint viscosity.
④ Slow evaporation of solvent.	④ Change to the solvent with faster evaporation.

⑨ Transparent paint film.

Cause	Countermeasure
① Low applied voltage.	① Increase the voltage setting of the high-voltage generator.
② Low paint discharge rate.	② Increase the paint discharge rate or decrease the gun travel speed.
③ Too low paint viscosity.	③ Increase the paint viscosity.

⑩ Pin holes (pores) occur.

Cause	Countermeasure
① Atomization air pollution.	① Clean the filter in the air route or replace.
② Too quick solvent evaporation.	② Change to the solvent with slower evaporation.
③ High workpiece temperature.	③ Decrease the workpiece temperature.
④ Undercoat is insufficiently dried.	④ Dry fully.
⑤ Short setting time.	⑤ Take enough time to set up.

⑪ Blushing occurs.

Cause	Countermeasure
① High temperature of the paint booth and high temperature.	① Change to the solvent with slower evaporation or inspect air conditioning.
② Unsuitable solvent selection.	② Consult with the paint/evaporation manufacturer or our company.

⑫ Pin holes occur.

Cause	Countermeasure
① Atomization air pollution.	① Clean the filter in the air route or replace.
② Insufficiently dried after water sanding.	② Dry fully.
③ Too thick paint film.	③ Decrease the paint discharge rate.
④ Too quick solvent evaporation.	④ Change to the solvent with slower evaporation.
⑤ Too high temperature of the bake oven.	⑤ Adjust the bake oven temperature to a suitable value.

9 Troubleshooting

Multiple faulty phenomena may occur simultaneously, depending on the situation of problems.

① Paint is spitted during the paint work (pattern fluctuates).

Cause	Countermeasure
① Air is included in paint.	① Check the paint feed route.
② Insufficient fastening of the air cap or jet of shaping air.	② Tighten the air cap and the jet fully.
③ Extremely low paint discharge rate.	③ Increase the paint discharge rate.

② Poor pattern shape (cracked pattern)

Cause	Countermeasure
① Scratch on the edge of the cup.	① Replace the cup.
② Insufficient fastening of the air cap or jet of shaping air.	② Tighten the air cap and the jet fully.
③ Scratch on the air cap or jet of shaping air.	③ Replace the air cap and the jet.
④ The cup is decentralized or insufficiently fastened.	④ Fasten the cup fully or replace.

③ The cup rotates unstably or does not rotate (the axis is not lifted).

Cause	Countermeasure
① Bearing air is not supplied or oil or another foreign object is included in bearing air.	① Check bearing air routes such as micro mist separator.
② The cup is decentralized or insufficiently fastened.	② Fasten the cup fully or replace.
③ The air cap of shaping air or the jet is decentralized or insufficiently fastened.	③ Fasten the air cap and the jet fully or replace.
④ The feed tube is deformed and makes contact with the cup.	④ Replace the feed tube.
⑤ Paint is adhered on the feed tube or the cup, and the cup and the cup feed are in contact.	⑤ Use a blush and clean the paint that is adhered on the feed tube or the cup.
⑥ Paint is adhered inside the cup, and the cup rotates out of balance.	⑥ Use a blush and clean the paint that is adhered on the cup.
⑦ Paint entered in the bearing because the paint was discharged with the gun upward.	⑦ Replace the spindle or request us for repair. *1
⑧ Paint entered in the bearing because the paint was discharged without cup rotation.	⑧ Replace the spindle or request us for repair. *1
⑨ Paint entered in the bearing after paint spilled inside the cup because paint is stuck in the paint discharge holes of the cup.	⑨ Clean paint discharge holes of the cup, replace the spindle or request us for repair. *1
⑩ Due to a high discharge rate of paint or solvent during cleaning, it spilled in the cup and entered the bearing.	⑩ Replace the spindle or request us for repair. *1
⑪ Scratch on an O-ring or a packing in the air route. Or there is a loose retainer or screw.	⑪ Replace an O-ring or a packing. Additionally fasten the retainer and screws.
⑫ The exhaust route is clogged due to dirt of the exhaust muffler.	⑫ Replace or remove the exhaust muffler.
⑬ Low supply temperature of bearing air.	⑬ Install the air heater.

④ Paint leaks from the rear barrel/ exhaust port.

Cause	Countermeasure
① Defective packing or O-ring of the needle.	① Remove two fastening bolts of the barrel and replace a packing set or an O-ring.
② Paint or solvent spilled out in the cup and entered in the spindle.	② See Section 3 of this chapter, “The cup rotates unstably or does not rotate”.

⑤ No speed display.

Cause	Countermeasure
① Adjustment failure of the fiber optic amplifier.	① Press the SET button of the fiber optic amplifier for 3 to 4 seconds.
② Fiber optic disconnection or loosening.	② Check that the fiber optic route is not bent so that it is not loosened. Or request us for repair. *1
③ Paint or solvent entered inside the spindle or the rotation detector.	③ See Section 3 of this chapter, “The cup rotates unstably or does not rotate”. Replace the spindle and the optical fiber cable or request us for repair. *1

⑥ Spark from the cup.

Cause	Countermeasure
① The high resistance tip of the high-voltage generator was damaged.	① Replace the cascade. *2
② The paint electric resistance value is low or paint was changed to metallic paint (use of the insulation stand only).	② Decrease the high voltage output.

⑦ The overcurrent buzzer goes ON.

Cause	Countermeasure
① Paint is adhered to the barrel.	① Clean the barrel.
② Paint leaked the rear barrel due to damage on the O-ring on the tip of the paint hose.	② Clean the paint hose and replace the O-ring.
③ The paint electric resistance value is low or paint was changed to metallic paint.	③ Decrease the high-voltage output or use the insulation stand.
④ Paint or solvent spilled out in the cup and entered in the spindle.	④ See Section 3 of this chapter, “The cup rotates unstably or does not rotate”.
⑤ There is a grounding object near the insulation stand. (Use of the insulation stand only)	⑤ Keep away the insulation stand from the grounding object for at least 300 mm.
⑥ Paint is adhered on the insulation rod of the insulation stand. (Use of the insulation stand only)	⑥ Clean the paint that is adhered on the insulation rod.
⑦ The section above the insulation rod of the insulation stand is grounded.	⑦ Separate the grounding of the section above the insulation rod.

⑧ The high voltage ON lamp is lighted up but the electrostatic effect is low or none.

Cause	Countermeasure
① Too low or too high electric resistance value of paint.	① Adjust the electric resistance value of the paint within 10 to 100 MΩ･cm with Asahi Sunac Electrostatic Tester.
② Paint is adhered to the barrel.	② Clean the barrel.
③ Connection cable is disconnected.	③ Replace the connector cable.
④ Faulty workpiece grounding.	④ Ground fully. Also, remove paint that is adhered on the conveyor or the hanger.

⑨ When touching a workpiece or a device, that delivered an electrical shock.

Cause	Countermeasure
① Incomplete grounding on workpieces or devices.	① Remove the paint from the conveyor hook or hanger, and be sure to ground devices in the working booth. (1 kΩ for metal and under 1 MΩ for resin)
② The worker him/herself is electrically charged.	② Use electrostatic shoes or others to avoid electric charging during the works.

About *1 in the above column, it cannot be recoverable if a non-expert disassembles the spindle. Be sure to request us for repair.
Also, about the *2 in the above column, incorrect adjustment may lead to risk of serious accidents. Our specialized engineers are only allowed.
If the applicable section is disassembled and repaired not by us, it is no longer subject to our guarantee. Moreover, please let us know the serial number marked under the cable installation section of the product in addition to the description of the failure when you contact us.

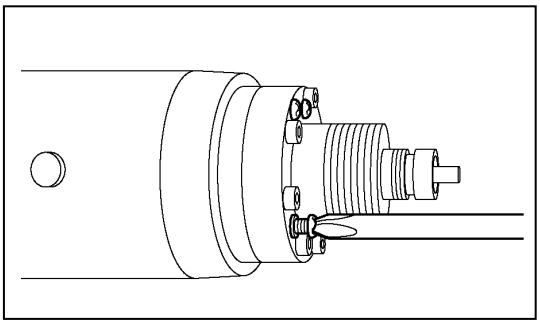
10 Parts Replacement Procedure and Adjustments

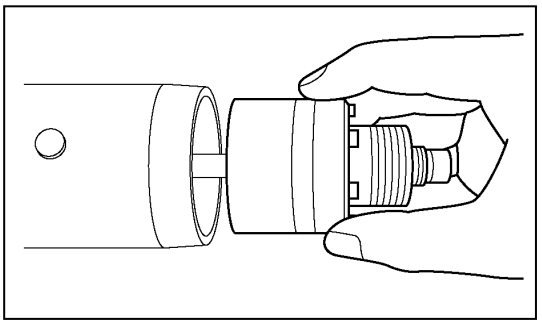
Follow the procedures below when replacing or repairing parts.

Be sure to turn OFF the power supplied to the gun. Clean and eject paint from the paint route and shut OFF compression air before replacement or repair.

① Removing the spindle

After the cup is removed, use a cross-ended screwdriver to remove four cross-recessed pan-head screws that fix the spindle. Pull the spindle straight and slowly to remove from the barrel.





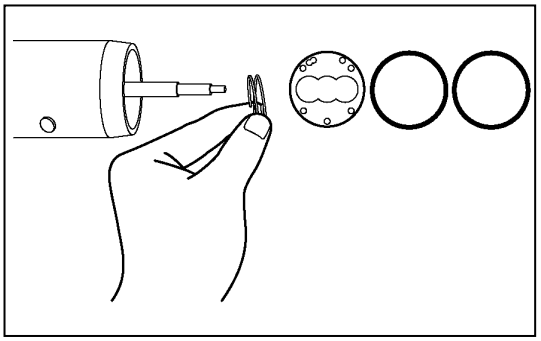
⚠ CAUTION

Be sure to pull straight out when pulling out the spindle. If it is pried or pulled at an angle, that may damage the feed tube. Also, contact and ask our representative for disassembly of the spindle. If disassembled without enough attention, it may not be able to be re-assembled.

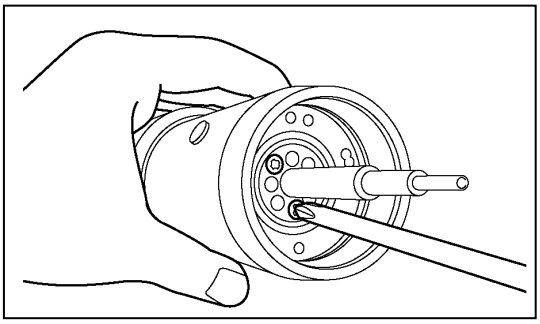
② Removing the feed tube

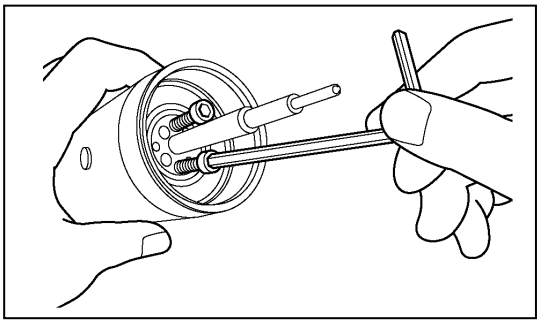
Eject solvent fully out of the paint route so that the fiber optic for rotatory detection is kept clear of paint or solvent.

(1) Remove the spindle and then an O-ring, a packing, and springs.



(2) Remove three flat-head bolts. Fit two M5-size screws next to them and fasten them slowly and equally to pull out the feed tube. If the M5-size screws are not available, use Hex. socket head cap screws (03-50525) that fix the gun to the base.

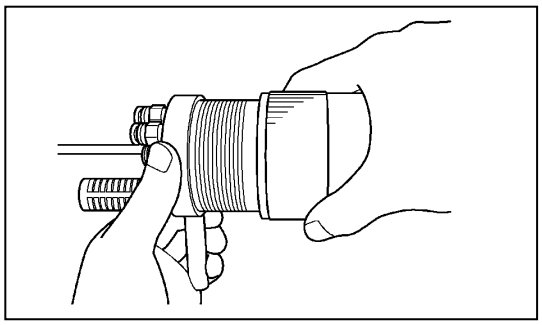




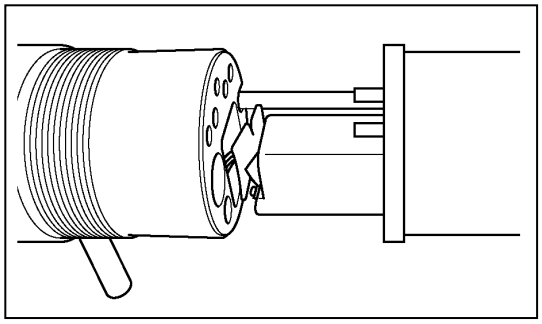
③ Removing the barrel

Eject solvent fully out of the paint route so that paint or solvent does not enter the spindle. Or try after the spindle and the feed tube are removed.

(1) Loosen the retainer.



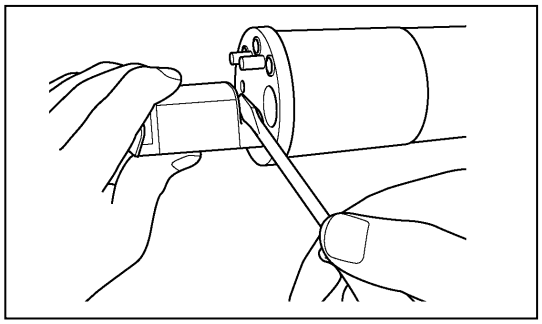
(2) Pull the barrel straight out to front. Pull out the cascade, the paint hose, and the fiber optic cable halfway.



⚠ CAUTION

Be sure to pull straight out and slowly when pulling out the barrel.
If it is pried or pulled at an angle, that may damage the cascade.

(3) Insert a flat-ended driver into a gap between the cascade and the barrel and lightly pry and pull out the cascade.
Then, remove the barrel while paying attention not to pull or bend the fiber optic cable.
Take caution likewise when you mount it as well.



(4) Be sure to replace new O-rings of the cascade and the paint hose at barrel installation.
To assemble to the barrel, fit the cascade first into the back of the barrel. Then, mount with care not to pinch an electric wire of the cascade.
In addition, pay attention not to pull or bend the fiber optic cable.

⚠ CAUTION

Slowly push the barrel in while pushing and returning.
If it is forcibly pushed, the O-ring is ripped and that may cause paint leak.

④ Removing the fiber optic cable

Eject solvent fully out of the paint route so that paint or solvent does not enter the spindle.

(1) See "③ Removing the barrel" to loosen the retainer. Pull the barrel straight out to front and pull out the cascade, the paint hose, and the fiber optic cable halfway.

(2) Carefully remove the green tube from a quick-connect joint and slowly the fiber from the gun.

⚠ CAUTION

Do not pull strongly when removing the tube or the fiber optic cable from a quick-connect joint. It may cause disconnection.

11 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.

Equipment name			NC Bell <ESA100>		Purchase date:	
Date of service			Portion worked on	Description	Result	Who serviced
						In-house / Dealer / Asahi Sunac
						In-house / Dealer / Asahi Sunac
						In-house / Dealer / Asahi Sunac
						In-house / Dealer / Asahi Sunac
						In-house / Dealer / Asahi Sunac
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						In-house / Dealer / Asahi Sunac
						In-house / Dealer / Asahi Sunac

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

12 Warranty

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 to 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. Failures resulting from misuse or non-conformance to the methods specified herein.
  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. Failures resulting from any other causes not attributable to us

- 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.

15th Edition: June 25, 2025

ASAHI SUNAC CORPORATION

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15th Edition: June 25, 2025