LEADING IN PRODUCTION EFFICIENCY

EcoGun AS MAN EC
Manual Spray Gun with External Charging

Operation manual

MSG00022EN, V03

www.durr.com

N36180001V

Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

Validity range of the document

This document describes the following product:

N36180001V
EcoGun AS MAN EC

Applicable documents

MHT00005* - **Eco**HT 80 controller

An asterisk (*) in the document number replaces the symbol of the language variant.

Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

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1 Product overview

1.1 Overview

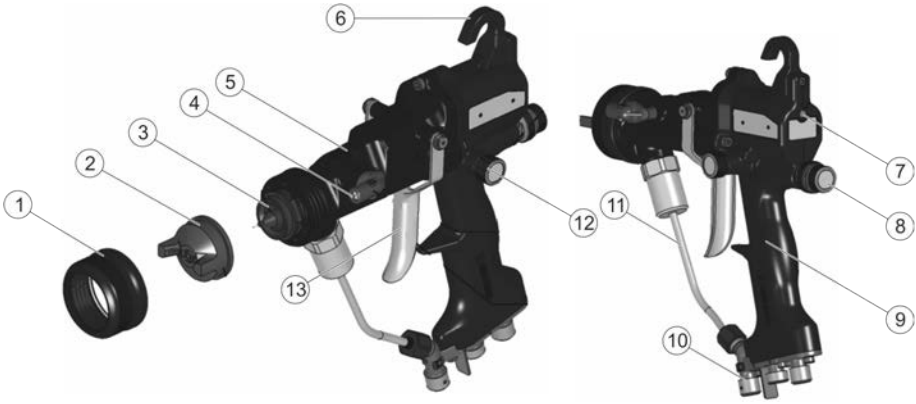

Fig. 1: Overview

1	Cap nut
2	Air cap
3	Nozzle
4	Electrode
5	Basic housing
6	Hook
7	H. V. indicator light
8	Material flow control
9	Housing
10	Connections
11	Paint tube
12	Flat jet control
13	Trigger

1.2 Short description

The spray gun is intended for electrostatic surface coating with non-flammable paints. Compressed air and external charging support the coating process. The spray gun is hand-held.

The following factors influence the spray jet and therefore the result:

- Alignment of the air cap ↳ 6.5 “Alignment of the air cap”
- Material quantity ↳ 5 “Commissioning”
- Spray width ↳ 5 “Commissioning”

2 Safety

2.1 Presentation of Notes

The following notes can appear in this instruction:

DANGER!

High risk situation that can lead to serious injuries or death.

WARNING!

Medium risk situation that can lead to serious injuries or death.

CAUTION!

Low risk situations that can lead to minor injuries.

NOTICE!

Situations that can lead to material damage.

Additional information and recommendations.

2.2 Intended Use

Use

The spray gun **Eco**Gun AS MAN EC is used exclusively for hand guided electrostatic coating of surfaces with non-flammable paints. The coating process must be conducted in a painting booth with suitable technical ventilation.

The spray gun **Eco**Gun AS MAN EC may only be operated in the industrial area and within the approved technical data 11 “Technical data”.

The **Eco**Gun AS MAN EC spray gun is approved for use in Class I Division 1.

Permitted device combination

The spray gun must only be combined with the following components:

Controller	Connection cable
EcoHT 80 controller (100 - 120V) E80020003	Connection cable, 10m E09070245
EcoHT 80 controller (200 - 240V) E80020004	

Misuse

If used incorrectly, it can cause serious injuries or death.

Examples of wrong use are:

- Aiming the spray gun at humans or animals
- Use outside of an spray booth
- Use without mechanical ventilation
- Atomization of fluid nitrogen
- Use of unapproved materials
- Combination of the spray gun with components that are not approved by Dürr Systems for operation.
- Unauthorized modifications
- Use in explosive dust atmospheres or in atmospheres with flammable fibers and fluff
- Use in other groups of substances, except D
- Use of the spray gun without knowing the operating instructions

Labelling according to CSA

Class I, Div 1, Group D; Tamb + 0°C to + 40°C

2.3 Residual risks

High voltage

High voltage can be present on components and cables. Electric shocks and discharges can cause serious injuries and death.

- Ground the spray gun.
- Ground the work piece.
- Connect any conducting objects and paint containers in the paint booth to the ground.
- Remove not required objects such as tools from the paint booth.
- Wear antistatic safety boots during operation.
- Wear antistatic protective gloves during operation.
- Do not touch the electrode during operation.

Explosion

Sparks, open flames and hot surfaces can cause explosions in explosive atmospheres. Serious injury and death could be the consequence.

- Before carrying out any work, make sure that there is no explosive atmosphere.
- Do not use sources of ignition and open light.
- Do not smoke.
- Ground the spray gun.
- Ground the work piece.
- Only use conductive lines.

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

- Ensure that the flashpoint of the fluid is at least 15 K above the ambient temperature.
- Note explosion group of the fluid.
- Follow the safety data sheet.
- Ensure that forced ventilation and fire protection equipment are in operation.
- Do not use sources of ignition and open light.
- Do not smoke.

Danger from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

- Ensure that the forced ventilation is operational.
- Follow safety data sheets.
- Wear specified protective equipment.

Escaping material

Material escaping under pressure can cause serious injuries.

Before working on the product:

- Disconnect the system, in which the product is installed, from compressed air and material supply.
- Depressurize the lines.
- Secure the system against being switched on again.

Noise

The noise during normal operation may cause severe hearing damage.

- Wear hearing protection.
- Do not spend more time then necessary in the work area.

2.4 Staff qualification

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

– Only sufficiently qualified persons may execute all work.
– Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

This document is intended for qualified personnel in industry and craftmanship.

Operator

The operator is trained specifically for the field of work in which he works.

Furthermore, the operator possesses the following knowledge:

- Technical Measures for occupational safety and health

The operator is responsible for the following work:

- Operate and monitor the system/ product.
- Introduce measures in the event of faults.
- Clean system/ product.

+ additional qualification explosion protection

In addition to the knowledge of the various specialist fields, the mechanic has knowledge of regulations and safety measures when working in potentially explosive areas.

+ additional qualification high tension technology
In addition to the knowledge of the various specialist fields, the mechanic has knowledge of the following specialist fields
- Painting process
- High voltage engineering for electrostatic coating

Dürr Systems offers special product training for “Hotline and Contact”.

2.5 Personal protective equipment

When working in explosive areas, the protective clothing, including gloves, must meet the requirements of explosion protection. Footwear must meet the requirements of ISO 20344 and IEC 61340-4-3. The volume resistivity must not exceed 100MΩ.

Wear the specified personal protective equipment when working. Provide the following personal protective equipment:

3 Transport, scope of supply and storage

3.1 Scope of delivery

Following components are included in the scope of supply:
- Spray gun
- Tool kit

Inspect delivery on receipt for completeness and integrity.

Report defects immediately “Hotline and Contact”.

3.2 Handling of packaging material

ENVIRONMENT!

Incorrect disposal

Incorrectly disposed packaging material can damage environment.
– Dispose of material no longer required in an environment-friendly manner.
– Observe local disposal specifications.

3.3 Storage

Requirements for the warehouse:
- Do not store outdoors.
- Store in a dry and dust-free place.
- Do not expose to aggressive media.
- Protect from solar radiation.
- Avoid mechanical vibrations.
- Temperature: 0°C to 40°C
- Relative humidity: 40% to 80%

4 Assembly

4.1 Requirements for the Installation point.

- The compressed air supply to the spray gun must be interrupted and secured against reconnection.
- The compressed air supply must be adjustable.
- Lines, seals and screw connections must be designed to conform to the requirements of the spray gun 11 “Technical data”.
- The workplace must have a mechanical ventilation.
- A hook or a lug must be provided for hanging the spray gun.

Working environment and grounding

The flooring of the working area must be anti-static according to DIN EN 50050-1:2014-03, measurement according to DIN EN 1081:1998-04. The antistatic flooring prevents electrostatic charges from building up. Dangerous flashovers are prevented.

4.2 Connecting

Personnel:

- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

1. **WARNING!**

   Sources of ignition may cause explosions!

   Ensure a non-explosive atmosphere.

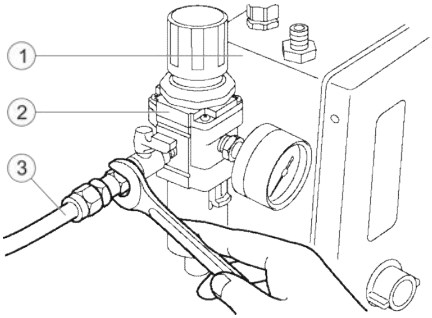

Fig. 2: Connect compressed air supply

2. Bolt compressed air supply (3) to the compressed air controller (2) of the electrostatic controller (1).

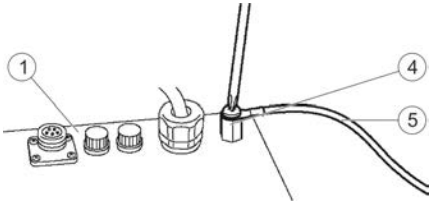

Fig. 3: Ground electrostatic controller

3. Screw on grounding cable (5) to the grounding bolt (4) of the electrostatic controller (1). Connect with the grounding point at the installation site.

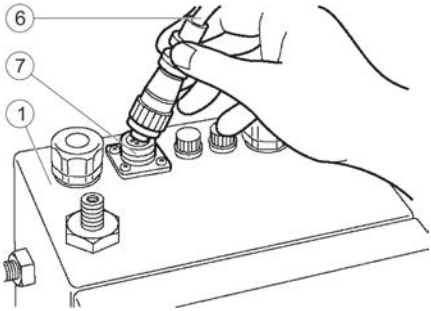

Fig. 4: Connect connection cable

4. Screw on connection cable (6) to the output (7) of the electrostatic controller (1).

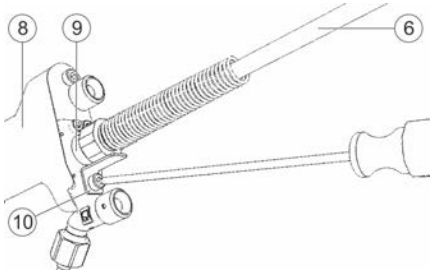

Fig. 5: Connect connection cable

5. Bolt connection cable (6) to the input (9) of the spray gun (8).
6. To prevent it from becoming loose, fasten connection cable (6) using the fastening bracket (10). Make sure that the cap nut of the connection cable (6) is positioned on the fastening bracket (10) with a flat side.

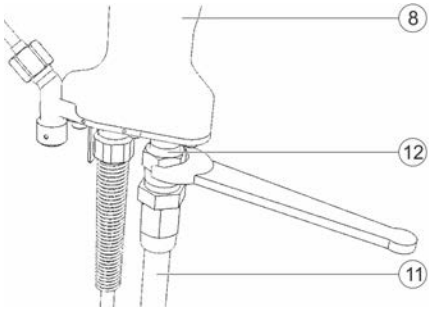

Fig. 6: Connect compressed air hose

7. Screw on compressed air hose (11) to the compressed air connection (12) of the spray gun (8).

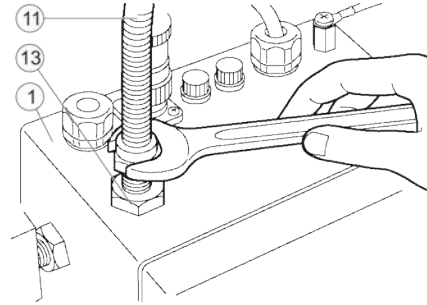

Fig. 7: Connect compressed air hose

8. Screw on compressed air hose (11) to the “AIR OUT” connection (13) of the electrostatic controller (1).

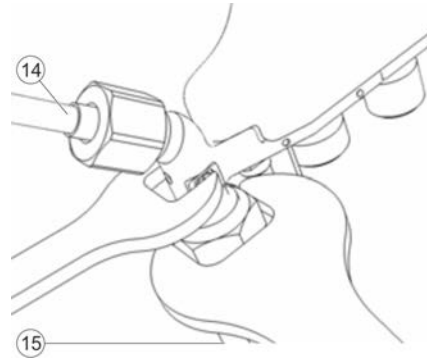

Fig. 8: Connecting material supply

9. Connect material supply (15) to the paint pipe (14).

Bundle connection cable

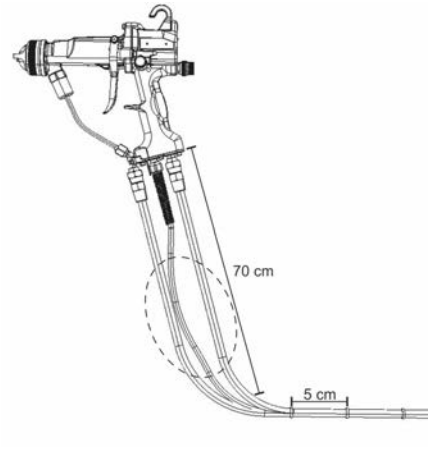

Fig. 9: Bundle connection cable

Adhere to the following conditions in order to avoid affecting the strength and live of the connection cable:

- Do not bundle the connection cable up to a distance of approx. 70cm from the spray gun.
- Bundle the connection cable with sufficient extra length to avoid it being pulled or overly bent during movements. Bundle the connection cable with a tie made of resin or plastic material.
- Bundle connection cable loosely every 5cm.
- Do not glue plastic tape and metal ties around the connection cable.

5 Commissioning

Ground spray gun and surroundings

Ground spray gun and the surroundings to ensure safe operation and good painting results.

Personnel:

- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots
- Protective workwear
- Eye protection
- Respiratory protection device
- Use ear protection

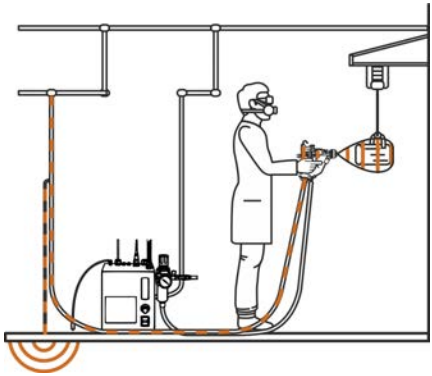

Fig. 10: Ground spray gun

1. Ground the spray gun.
   ⇨ With a correct installation, the spray gun is grounded via the controller and the material supply.

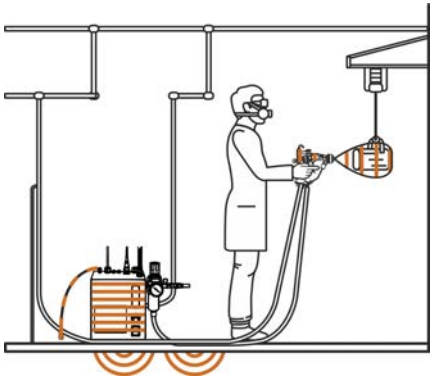

Fig. 11: Ground material supply system

2. Ground material supply system.

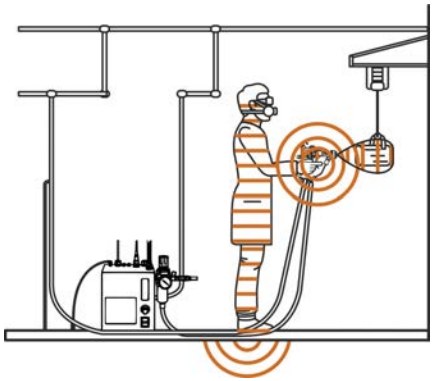

Fig. 12: Ground operator

3. Ground operator.

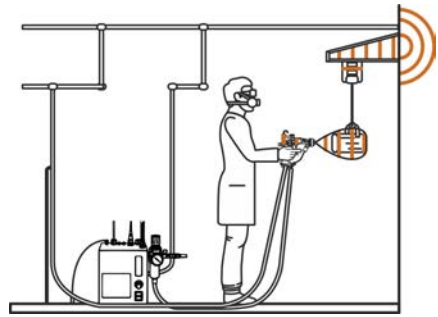

Fig. 13: Ground work piece

4. Ground the work piece.

Perform functional check of high voltage

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Protective workwear
- Eye protection
- Respiratory protection device
- Use ear protection

Requirements:
- The connection cable, the compressed air hose and the material supply were assembled ↳ 4.2 “Connecting”.

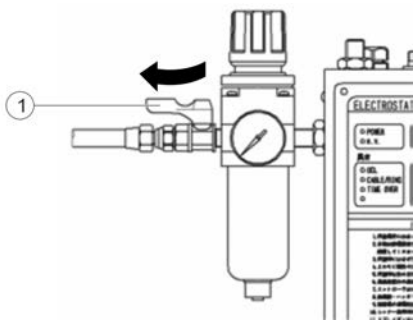

Fig. 14: Open ball valve

1. Open ball valve (1).

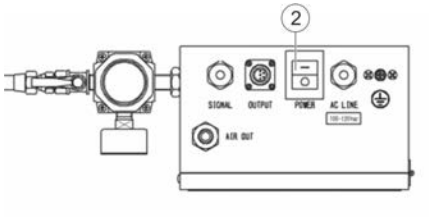

Fig. 15: Switch on electrostatic controller

2. Switch on the electrostatic controller (2).

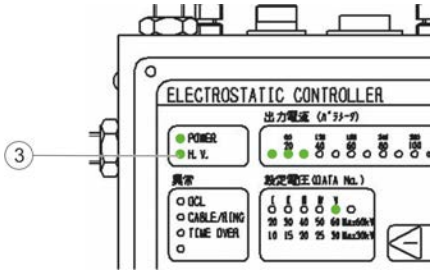

Fig. 16: “H. V.” indicator light

3. Pull the trigger of the spray gun.
   ⇨ The “H. V.” indicator light (3) on the electrostatic controller lights up green.

   The “H. V.” indicator light on the spray gun lights up red.
4. Switch off the electrostatic controller (2).

Setting the spray pattern

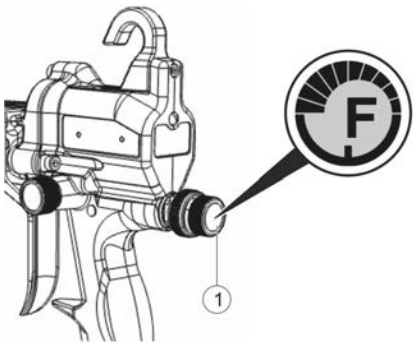

Fig. 17: Setting the material flow

1. Set the material quantity by turning the material flow control (1).
   - Right turn: Reduce material quantity.
   - Left turn: Increase material quantity.

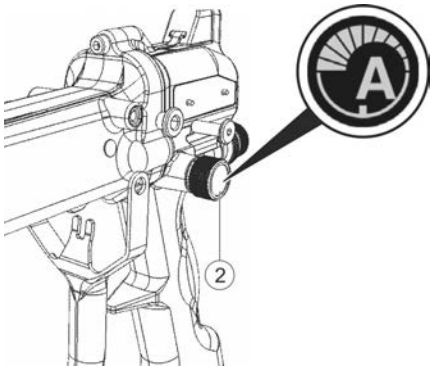

Fig. 18: Set spray width

2. Set the spray width by turning the flat jet setting (2).
   - Right turn: Minimize spray width.
   - Left turn: Maximize spray width.

6 Operation

6.1 Safety recommendations

WARNING!

Danger of explosion due to chemical reactions

Material, halogenated hydrocarbon-based rinsing agent or cleaning agent can chemically react with aluminum components of the product. Chemical reactions can cause explosions. Serious injuries and death can be the consequence.

– Only use rinsing agents and cleaning agents that do not contain any halogenated hydrocarbons.

NOTICE!

Material damage due to dried material residues

If material residues dry in the product, that can harm components.

– Rinse product immediately after each use.

6.2 General notes

1. Perform the following checks during operation:
   - Check O-rings for correct seating and tightness.
   - Check air car for cleanliness.
   - Check nozzle for cleanliness.

6.3 Selecting air cap

The spray gun is suitable for different applications. The selection of the air cap determines the area of application.

Air cap HN 400

The air cap HN 400 is used for small and narrow applications:

- Spray pattern width 30 - 170mm
- Flow rate 50 - 160mL/min

Air cap HN 600

The air cap HN 600 is the standard type. It achieves a great degree of efficiency with fine atomizing:

- Spray pattern width 90 - 300mm
- Flow rate 150 - 280mL/min

Air cap HN 800

The air cap HN 800 is a highly atomizing model for applications with higher viscosity or higher flow rates:

- Spray pattern width 230 - 350mm
- Flow rate 230 - 400mL/min

6.4 Changing the air cap

Personnel:

- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

Requirements:

- The electrostatic controller is switched off.

Remove air cap

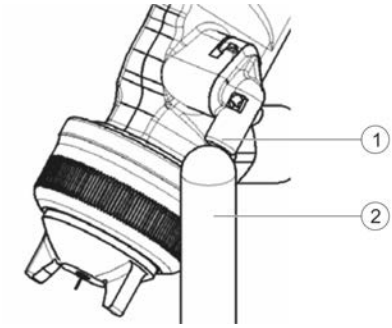

Fig. 19: Ground electrode

1. Discharge electrode (1) using a grounding rod (2). In this, pull the trigger completely.

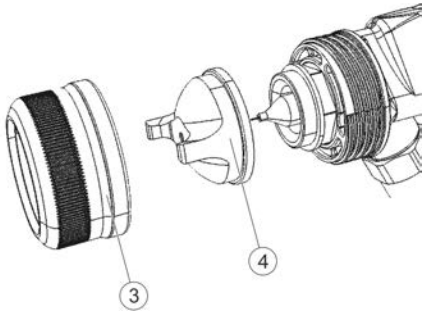

Fig. 20: Replace air cap

2. Loosen cap nut (3).
3. Remove air cap (4).

Assemble air cap

4. **CAUTION!**

   Risk of injury from pointed electrode

   Fit air cap (4).

5. Align air cap (4) as required ↳ 6.5 “Alignment of the air cap”.
6. Tighten cap nut (3) by hand.

6.5 Alignment of the air cap

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

The position of the air cap determines the alignment of the spray pattern.

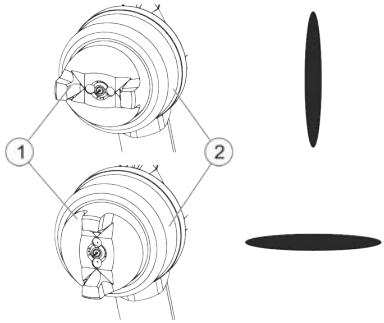

Fig. 21: Align air cap

1. Lightly loosen the cap nut (2).
2. Turn the air cap (1) as required for the desired spray pattern.
3. Tighten cap nut (2) by hand.

6.6 Guiding the spray gun

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Protective workwear
- Eye protection
- Respiratory protection device
- Use ear protection
- Protective gloves

WARNING!

Spark discharging in explosive atmosphere

Spark discharging in explosive atmosphere can cause explosions. Serious injury and death could be the consequence.
- Use antistatic protective gloves.
- If no conductive protective gloves are available, the glove guiding the spray gun must have a hole in the palm of the hand. This hole must ensure extensive contact of the palm of the hand with the handle of the spray gun.

Requirements:

- The spray gun has been put into operation 5 “Commissioning”.
- The electrostatic controller is switched on.

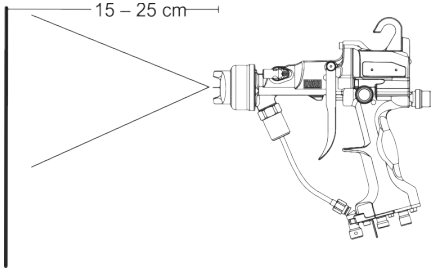

Fig. 22: Guide the spray gun

1. Guide spray gun as follows:
   - Guide spray gun at 90 degrees to the surface.
   - Maintain a distance of 15 to max. 25cm to the surface.

   The distance can vary for effect coatings.

6.7 Rinsing

6.7.1 Safety recommendations

NOTICE!

Material damage due to unsuitable rinsing agent

If the rinsing agent reacts chemically with the components or the material, components get damaged.

– Use only the rinsing agents that are compatible with the components and the material.
– Refer to safety data sheet of material manufacturer.

6.7.2 Rinsing spray gun

NOTICE!

Clogged air channels

If the material or rinsing agent reaches into the air channels, air channels can clog up. This can result in faulty painting results.

– Keep spray gun horizontal or directed downwards during the rinsing process.

Rinse the spray gun in the following cases:

- After end of operation
- Before every change of material
- Prior to cleaning
- Prior to dismantling
- Before a long time of non-use
- Before placing in storage

Rinsing intervals depend on the material used.

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Respiratory protection device
- Eye protection
- Use ear protection
- Protective gloves
- Anti-Static Safety Boots

Requirements:
- Technical ventilation is in operation.
- Material pressure is switched off.
- A collecting tray for material and detergent is available.

1. Switch off electrostatic controller.
2. Set air pressure at the compressed air controller to 0bar.
3. Disconnect spray gun from the material supply.
4. Pull trigger.
   ⇨ The residual paint is blown out of the spray gun.

   Collect residual paint in the collecting tray.
5. Connect detergent supply.
6. Rinse the spray gun with an appropriate detergent until the detergent runs clean without any material residue.
   ⇨ Collect detergent in the collecting tray.
7. Ensure proper disposal of the exiting material and rinsing agent.
8. Depressurize detergent supply.
9. Disconnect detergent supply.

7 Cleaning

7.1 Safety recommendations

DANGER!

High voltage

High voltage can be present on components and cables. There is a risk of death due to electric shocks and discharges.

Before carrying out any work:
- Switch off electrostatic controller.
- Discharge electrode by means of a grounding rod. In this, pull the trigger completely.
- Verify no current is present.

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.
- Ensure that the flashpoint of the fluid is at least 15 K above the ambient temperature.
- Note explosion group of the fluid.
- Follow safety data sheets.
- Ensure that forced ventilation and fire protection equipment are in operation.
- Do not use sources of ignition and open light.
- Do not smoke.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

– Ensure that the forced ventilation is operational.
– Follow safety data sheets.
– Wear specified protective clothing.

WARNING!

Danger of explosion due to chemical reactions

Material, halogenated hydrocarbon-based rinsing agent or cleaning agent can chemically react with aluminum components of the product. Chemical reactions can cause explosions. Serious injuries and death can be the consequence.

– Only use rinsing agents and cleaning agents that do not contain any halogenated hydrocarbons.

NOTICE!

Damage due to unsuitable cleaning tools

Unsuitable cleaning tools can damage the product.

– Only use cloths, soft brushes and paintbrushes.
– Do not use abrasive cleaning tools.
– Do not poke blocked nozzles with metallic objects.
– Do not use compressed air for cleaning.
– Do not use any thinner spray guns.
– Do not use high pressure for cleaning agents.

NOTICE!

Unsuitable cleaning agents

Unsuitable cleaning agents can damage the product.

– Only use cleaning agents approved by the material manufacturer.
– Follow safety data sheets.
– Place heavily soiled components in a cleaning bath.
  – Only place those parts in the cleaning bath, which are suitable for the cleaning bath.
  – Use only electrically conductive containers.
  – Ground the container.
  – Do not use ultrasound baths.

» Use alcohols (isopropanol, butanol) for non-flammable coating materials.
» Remove dried non-flammable coating materials using a material manufacturer-approved organic thinner.
» When cleaning with flammable detergent, do not spray into a closed container. An explosive gas-air mixture can form inside closed containers.

7.2 Cleaning

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Use ear protection
- Eye protection
- Respiratory protection device
- Protective workwear
- Protective gloves
- Anti-Static Safety Boots

1. Purge spray gun ↳ 6.7 “Rinsing”.
2. Remove material residues with a cloth or a soft brush.
3. Clean the spray gun carefully and dry it with a soft cloth.

Clean air cap and nozzle

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Protective gloves
- Anti-Static Safety Boots

For a thorough cleaning, air cap and nozzle must be disassembled.

Disassembly

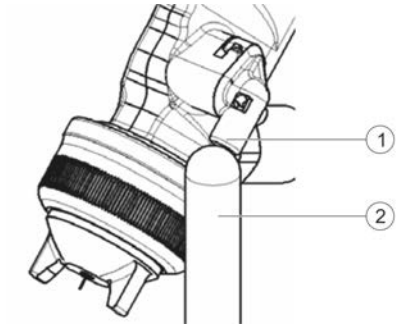

Fig. 23: Ground electrode

1. Discharge electrode (1) using a grounding rod (2). In this, pull the trigger completely.

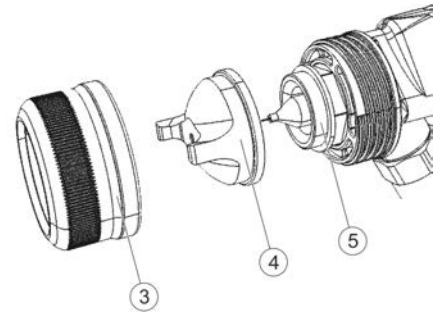

Fig. 24: Replace air cap

2. Loosen cap nut (3).
3. Remove air cap (4).
4. Pull trigger.
   ⇨ The needle is pulled backwards so that it will not be damaged during disassembly of the nozzle (5).
5. Unscrew and remove the nozzle (5) with the supplied open-end wrench (included in the tool kit).

6. Release trigger lever.
7. Clean air cap (4) using cleaning agent and cleaning brush.
8. Dry cleaned air cap (4) using compressed air (at max. 2bar).
9. Clean the nozzle (5) in the cleaning bath using a soft brush.

Assembly

10. Insert and tighten nozzle (5).
    » Tightening torque: 10Nm
11. Fit air cap (4).
12. Hand-tighten cap nut (3).

8 Maintenance

8.1 Safety notes

DANGER!

High voltage

High voltage can be present on components and cables. There is a risk of death due to electric shocks and discharges.

Before carrying out any work:

– Switch off electrostatic controller.
– Discharge electrode by means of a grounding rod. In this, pull the trigger completely.
– Verify no current is present.

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the explosion protection specifications can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

– Ensure that the forced ventilation is operational.
– Follow safety data sheets.
– Wear specified protective clothing.

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before carrying out any work:

– Disconnect the system, in which the spray gun is installed, from compressed air and material supply.
– Secure the system against being switched on again.
– Depressurize the lines.

8.2 Maintenance schedule

The intervals of some maintenance work depend on the used materials. The intervals can be adapted to the operating conditions.

Interval	Maintenance work
After each use	Purge spray gun ↳ 6.7 “Rinsing”.
Daily	Check state and tightness of the spray gun as well as of the connections and lines.
After each disassembly and after each cleaning	Lubricate material flow control ↳ 9.3.3 “Replace material flow control”.
	Lubricate flat jet control ↳ 9.3.2 “Replace flat jet control”.

9 Faults

9.1 Safety recommendations

DANGER!

High voltage

High voltage can be present on components and cables. There is a risk of death due to electric shocks and discharges.

Before carrying out any work:

– Switch off electrostatic controller.
– Discharge electrode by means of a grounding rod. In this, pull the trigger completely.
– Verify no current is present.

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the explosion protection specifications can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

NOTICE!

Property damage due to improper handling

Mechanical load can damage needle and nozzle.

– Handle with care during installation and dismantling.
– Do not subject the needle to any mechanical pressure.
– Avoid collisions of components to be assembled and disassembled with the needle.
– Do not excessively tighten components.

9.2 Defects table

Visualizer of typical spray pattern problems

Spray pattern	Fault identification
	Spray jet is distorted.
	Spray jet is bent or tapered.
	Spray jet is too thick in the middle.
	Spray jet is split.
	Spray jet is uneven.

The numbers after the components refer to the explosion views in chapter ↳ 12.1 “Replacement parts”.

Fault description	Cause	Remedy
Spray jet is distorted.	Air cap is misaligned	Rotate air cap into the desired position. ↳ 6.5 “Alignment of the air cap”
Spray jet is bent or tapered.	Bores in air cap are soiled	Clean and check air cap. Replace air cap if defective. ↳ 7.2 “Cleaning”
	Nozzle seat soiled	Clean nozzle seat. ↳ 7.2 “Cleaning”
	Nozzle (27) soiled or defective.	Clean and check the nozzle. If nozzle is defective, replace it along with the needle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
	Electrode needle (26) is bent.	Replace electrode needle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
Spray jet is too thick in the middle.	Material too viscous	Change material consistency.
	Horn air pressure too low	Decrease the horn air pressure via the flat jet control.
	Air pressure too low	Increase the air pressure via the total air control.
Spray jet is split.	Material too thin	Change material consistency.
	Horn air pressure too high	Decrease the horn air pressure via the flat jet control.
	Air pressure too high	Decrease the air pressure via the total air control.
Spray jet is uneven. The spray pattern quality is bad.	Nozzle (27) soiled or defective.	Clean and check the nozzle. If nozzle is defective, replace it along with the needle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
	Cap nut (28) or nozzle (27) not properly tightened	Tighten cap nut and nozzle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”

Fault description	Cause	Remedy
No material	Feed line pinched or broken.	Check the line.
Too much overspray or poor transfer rate (efficiency)	Distance to the work piece is too large.	Reduce distance to 15 to 20cm.
	Atomizer air pressure is too high.	Decrease atomizer air pressure.
	Work piece is not properly grounded.	Ground the work piece properly.
Low covering capacity	Live voltage is too low.	Increase output voltage at the electrostatic controller.
Air escapes between valve pin (17) and housing (19).	Sealing ring (18) is worn out.	Replace sealing ring.
Paint drops from the work piece.	Layer of paint is too thick.	Reduce feed rate or move spray gun more quickly.
	Viscosity is too low.	Increase viscosity.
Paint leakage on the nozzle	Nozzle (27) is soiled or defective.	Replace nozzle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
	Electrode needle (26) is defective.	Replace electrode needle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
	Dried-on paint residues on the needle (11)	Disassemble and clean needle. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
Paint leakage on the sealing ring (23).	Seal kit (25) is defective.	Replace seal kit. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
	Poorly seating seal kit (25).	Check if the seal kit is properly assembled. ↳ 9.3.1 “Replace needle, nozzle and seal kit”
Air escapes from the nozzle, even though the trigger is not pulled.	Valve set (17) is soiled or defective.	Clean valve set. ↳ 9.3.5 “Replace valve set”
	Valve set (17) is defective.	Replace valve set. ↳ 9.3.5 “Replace valve set”

Fault description	Cause	Remedy
Air escapes on the material flow control (6) or the valve (7).	O-ring (33, 34) is defective.	Replace O-ring. ↳ 9.3.3 “Replace material flow control”
Sparking on the electrode	Cascade (10) is defective.	Replace cascade. ↳ 9.3.9 “Replace cascade”
	Electrode (21) is defective.	Replace electrode. ↳ 9.3.10 “Replace electrode”
“H.V.” LED lights up, even though the gun trigger is released.	Air leakage on gun or air hose	Rectify air leakage.
	Flow switch in the controller is defective.	Replace flow switch. ↳ “Applicable documents”, operating instructions of the controller
	Flow switch is contaminated with oil, water or dirt.	Replace flow switch. ↳ “Applicable documents”, operating instructions of the controller
Warning tone or alarm on the controller	Basic housing (24) contaminated with paint	Clean basic housing. ↳ 7.2 “Cleaning”
	Paint hose contaminated with paint	Clean paint hose.
	Spray distance is too close	Increase spray distance or decrease voltage value.
	Water build-up in the air ducts of the basic housing	Drain water on the maintenance unit. Blow out the air ducts.
	Electrode (21) contaminated with paint	Clean or replace electrode (21). ↳ 9.3.10 “Replace electrode”
	Worn out seal kit (25).	Replace seal kit. ↳ 9.3.1 “Replace needle, nozzle and seal kit”

9.3 Troubleshooting

9.3.1 Replace needle, nozzle and seal kit

Personnel:

- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Eye protection
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled ↳ 10.2 “Disassembly”.

Disassembly

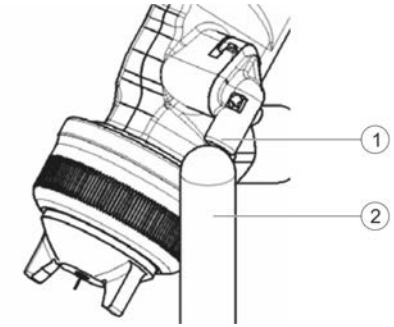

Fig. 25: Ground electrode

1. Discharge electrode (1) using a grounding rod (2). In this, pull the trigger completely.

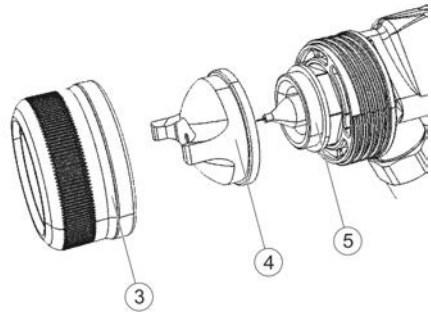

Fig. 26: Disassemble air cap and nozzle

2. Loosen cap nut (3).
3. Remove air cap (4).
4. Pull the trigger (11) completely.
   ⇨ The needle is pulled backwards so that it will not be damaged during disassembly of the nozzle (5).
5. Unscrew and remove the nozzle (5) with the supplied open-end wrench (included in the tool kit).
6. Release trigger (11).

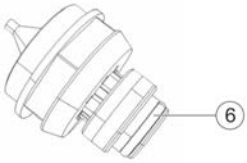

Fig. 27: Replace O-ring of nozzle

7. Replace O-ring (6) if damaged.
8. Pull the trigger (11) completely.

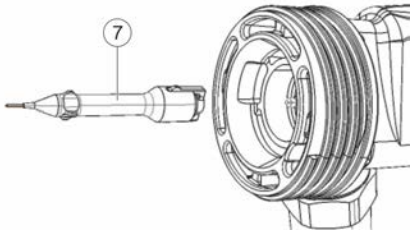

Fig. 28: Disassemble electrode needle

9. Turn electrode needle (7) counterclockwise using the fingers and remove it.

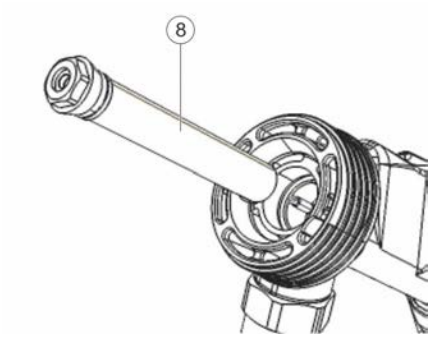

Fig. 29: Disassemble seal set

10. Unscrew and remove the seal kit (8) with the supplied socket wrench (included in the tool kit).

    For easier removal of the seal kit, pull and release the trigger several times.

11. Release trigger (11).

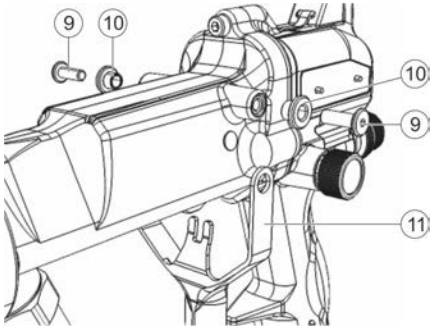

Fig. 30: Disassemble trigger

12. Loosen both screws (9) on the trigger (11) using a hexagon socket wrench and remove them.
13. Remove collar bushings (10).
14. Remove trigger (11).

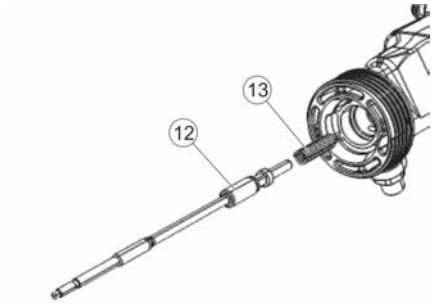

Fig. 31: Disassemble needle

15. Remove needle (12) and compression spring (13).

Assembly

16. Insert compression spring (13) and needle (12) in the housing.
17. Move trigger (11) over the housing until the bores are one over the other.
18. Insert collar bushings (10) into the bores.
19. Insert and tighten screws (9).
20. Pull the trigger (11) completely and keep it pulled.
21. Insert seal kit (8). Tighten carefully.
22. Insert electrode needle (7). Tighten by hand in clockwise direction.
23. Insert nozzle (5). Tighten carefully.
24. Release trigger (11).
25. Insert air cap (4).
26. Tighten cap nut (3).

9.3.2 Replace flat jet control

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled 10.2 “Disassembly”.

Disassembly

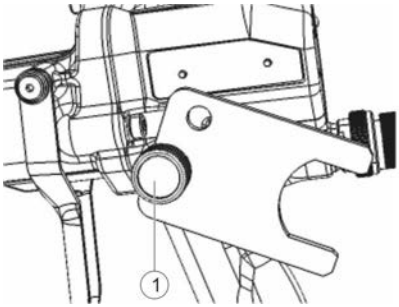

Fig. 32: Disassemble valve

1. Open valve (1).
2. Unscrew and remove the valve (1) with the supplied open-end wrench (included in the tool kit).

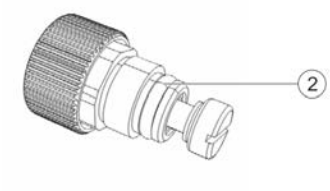

Fig. 33: Replace O-ring of valve

3. Replace O-ring (2).

Assembly

4. Lightly grease new O-ring (2).
5. Insert and tighten valve (1).

9.3.3 Replace material flow control

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled 10.2 “Disassembly”.

Disassembly

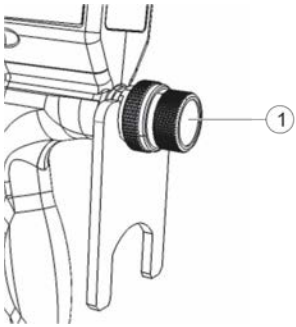

Fig. 34: Disassemble adjusting screw

1. Unscrew and remove the adjusting screw (1) with the supplied open-end wrench (included in the tool kit).

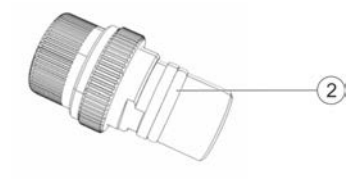

Fig. 35: Replace O-ring of the adjusting screw

2. Replace O-ring (2).

Assembly

3. Lightly grease new O-ring (2).
4. Insert and tighten adjusting screw (1).

9.3.4 Replace handle

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Disassembly

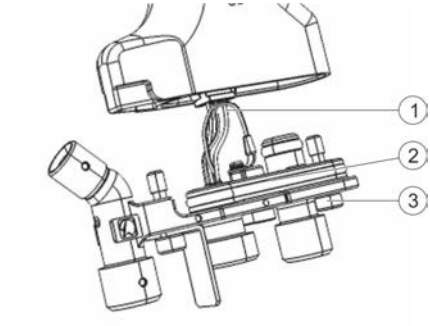

Fig. 36: Replace handle

1. Loosen screws (3) using a hexagon socket wrench.
2. Remove connecting piece (2).
3. Disconnect cable (1).

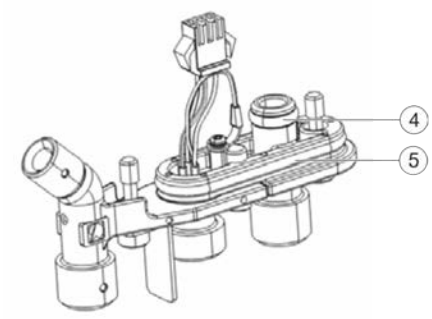

Fig. 37: Replace O-rings of the handle

4. Replace O-rings (4, 5).

Assembly

5. Grease new O-rings (4, 5).
6. Insert cable (1).
7. Insert connecting piece (2).
8. Insert and tighten screws (3).
   - Tightening torque: 1Nm

9.3.5 Replace valve set

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The material flow control is disassembled ↳ 9.3.3 “Replace material flow control”.

Disassembly

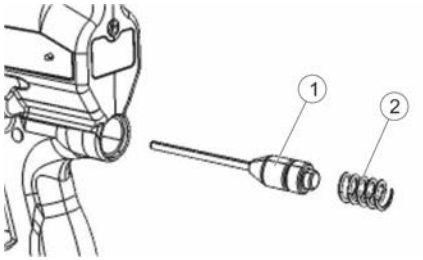

Fig. 38: Replace valve set

1. Remove compression spring (2) using pliers.
2. Remove valve set (1).

Assembly

3. Insert valve set (1).
4. Insert compression spring (2).
5. Assemble material flow control ↳ 9.3.3 “Replace material flow control”.

9.3.6 Replace hook

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled ↳ 10.2 “Disassembly”.

Disassembly

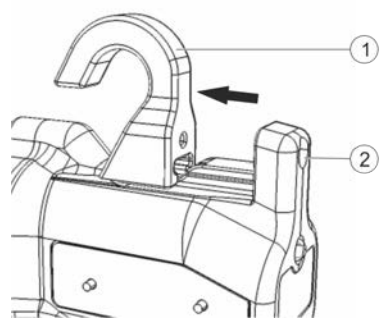

Fig. 39: Replace hook

1. Loosen and remove screw (2) using a hexagon socket wrench.
2. Push hook (1) from the base body.

Assembly

3. Push hook (1) onto the base body.
4. Insert and tighten screw (2).

9.3.7 Replacing sealing ring

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The trigger is disassembled 9.3.1 “Replace needle, nozzle and seal kit”.

Disassembly

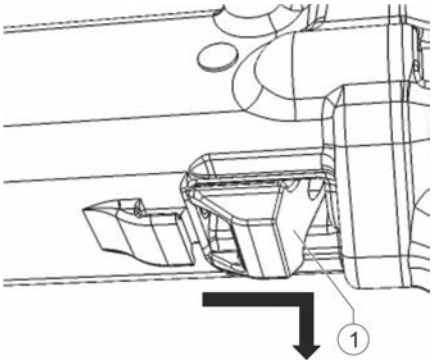

Fig. 40: Disassemble cover

1. Remove cover (1).

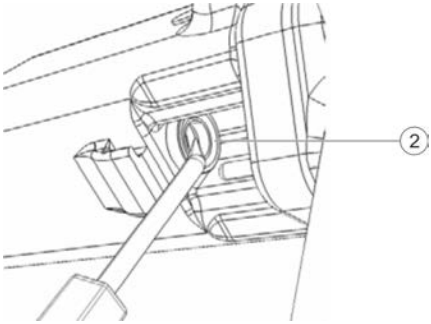

Fig. 41: Assemble sealing ring

2. Remove sealing ring (2).

Assembly

3. Insert sealing ring (2).
4. Fit cover (1).
5. Press against the cover (1) (such as by using a screwdriver) in order to press the sealing ring (2) in.

> **NOTICE!**
>
> If the sealing ring is pressed into the housing without the cover, the sealing ring may become damaged.

6. Assemble trigger 9.3.1 “Replace needle, nozzle and seal kit”.

9.3.8 Replace paint pipe

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled 10.2 “Disassembly”.

Disassembly

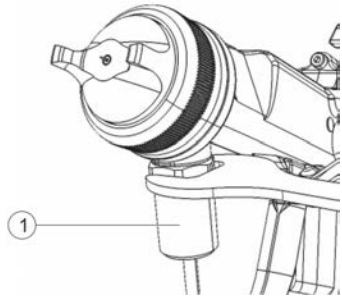

Fig. 42: Disassemble cover

1. Loosen cover (1) with open-end wrench SW22.

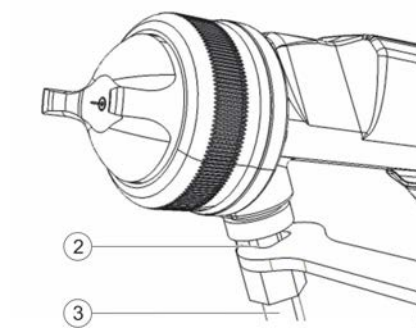

Fig. 43: Loosen nuts

2. Loosen the nuts (2, 4) with the supplied open-end wrench (included in the tool kit).
3. Remove paint pipe (3).

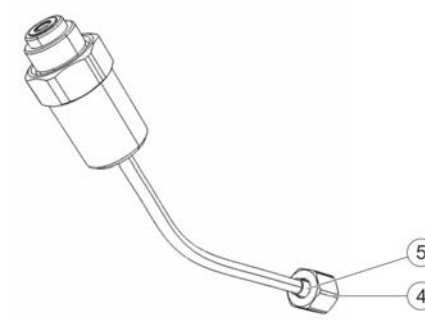

Fig. 44: Replace plug sleeve

4. Replace plug sleeve (5).

Assembly

5. Insert paint pipe (3).
6. Tighten nuts (2, 4).
7. Tighten cover (1).

9.3.9 Replace cascade

Personnel:

- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

Requirements:

- The spray gun is disassembled 10.2 “Disassembly”.

Disassembly

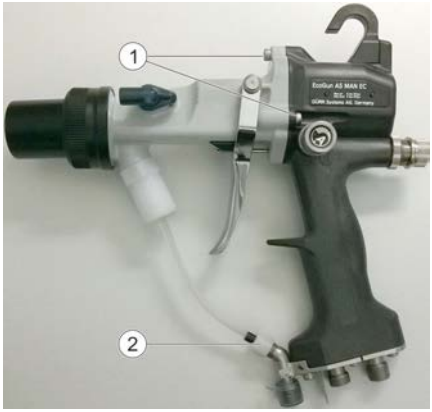

Fig. 45: Loosening Screws

1. Loosen the nut (2) with the supplied open-end wrench (included in the tool kit).
2. Loosen three screws (1).

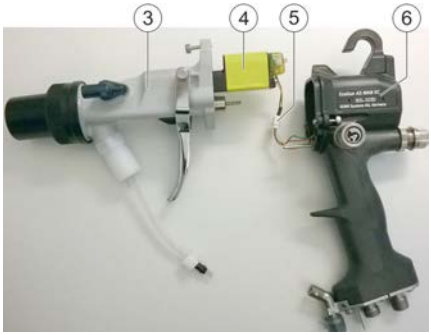

Fig. 46: Disconnect cascade connection

3. Carefully pull housing (6) and basic housing (3) apart.
4. Disconnect connection (5) of the cascade (4).
5. Pull cascade (4) out of the basic housing (3).

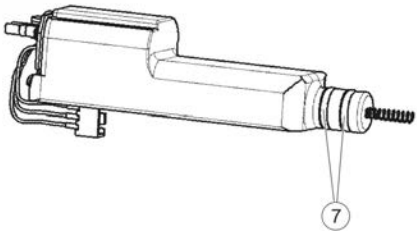

Fig. 47: Replace O-rings of the cascade

6. Replace O-rings (7).

Assembly

7. Lightly grease new O-rings (7).
8. Insert cascade (4) into the basic housing (3).
9. Connect connection (5) of the cascade (4).

10. Pull housing (6) and basic housing (3) together.
11. Insert and tighten three screws (1).
12. Tighten nut (2).

9.3.10 Replace electrode

Personnel:
- Operator
- + additional qualification high tension technology
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots

Requirements:
- The spray gun is disassembled 10.2 “Disassembly”.

Disassembly

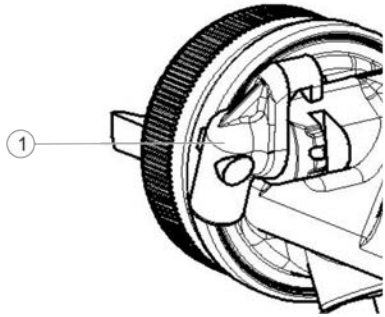

Fig. 48: Disassemble electrode

1. Rotate electrode (1) by hand by 90° and pull it off.

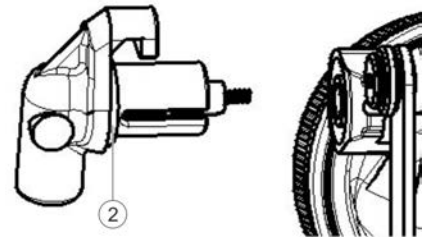

Fig. 49: Replace O-ring

2. Replace O-ring (2).

Assembly

3. Insert electrode (1) by hand up to the stop. Turn into spraying direction, until a clicking sound is heard.

10 Disassembly and Disposal

10.1 Safety recommendations

DANGER!

High voltage

High voltage can be present on components and cables. There is a risk of death due to electric shocks and discharges.

Before carrying out any work:
- Switch off electrostatic controller.
- Discharge electrode by means of a grounding rod. In this, pull the trigger completely.
- Verify no current is present.

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before carrying out any work:

– Disconnect the system, in which the spray gun is installed, from compressed air and material supply.
– Secure the system against being switched on again.
– Depressurize the lines.

10.2 Disassembly

Personnel:

» Operator
» + additional qualification high tension technology
» + additional qualification explosion protection

Protective equipment:

» Use ear protection
» Eye protection
» Respiratory protection device
» Protective workwear
» Anti-Static Safety Boots

1. Purge spray gun ↳ 6.7 “Rinsing”.
2. Switch off electrostatic controller.
3. Disconnect the compressed air supply and material feed. Secure against reconnection.
4. Disconnect all lines.
5. Clean spray gun ↳ 7 “Cleaning”.

10.3 Disposal

ENVIRONMENT!

Incorrect disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

– Always dispose of components in accordance with their characteristic. ↳ 11.6 “Materials used”
– Collect leaked out operating and auxiliary materials completely.
– Dispose of operating and auxiliary materials according to the disposal provisions in force.
– In case of doubt, refer to the local disposal authorities.

11 Technical data

11.1 Dimensions and weight

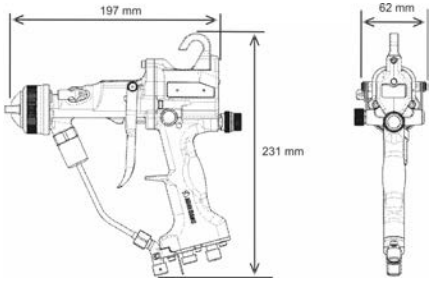

Fig. 50: Dimensions

Detail	Value
Weight	520g
Height	231mm
Length	197mm
Width	62mm

11.2 Connections

Connection	Nominal width
Material	G3/8"
Air	G1/4"

11.3 Operating conditions

Detail	Value
Maximum allowable material temperature	40°C
Operating temperature	0 - 40°C
Relative humidity	40 - 80%

11.4 Operating values

Detail	Value
Max. air pressure	0.6MPa 6bar 90psi
Material pressure, max.	0.6MPa 6bar 90psi
Voltage (DC), max.	30kV
Current, max.	80µA
Discharge energy, max.	0.23mJ

11.5 Type plate

The type plate is placed on the housing and features the following details:

- Product name
- Material number
- Year of manufacture
- Serial number
- CSA logo
- CSA information
- Manufacturer

11.6 Materials used

Component	Material
Connections	Stainless steel
Screws, bolts	Stainless steel
Materials in contact with material	Stainless steel, PBT, PE, POM, PA

11.7 Operating and auxiliary materials

Material	Material number
Grease tube Syntheso GLEP 1, 100g (for seals and threads)	W32020010

11.8 Material specification

Suitable Material:

- Non-flammable fluid coating materials and their approved detergents

12 Replacement parts, tools and accessories

12.1 Replacement parts

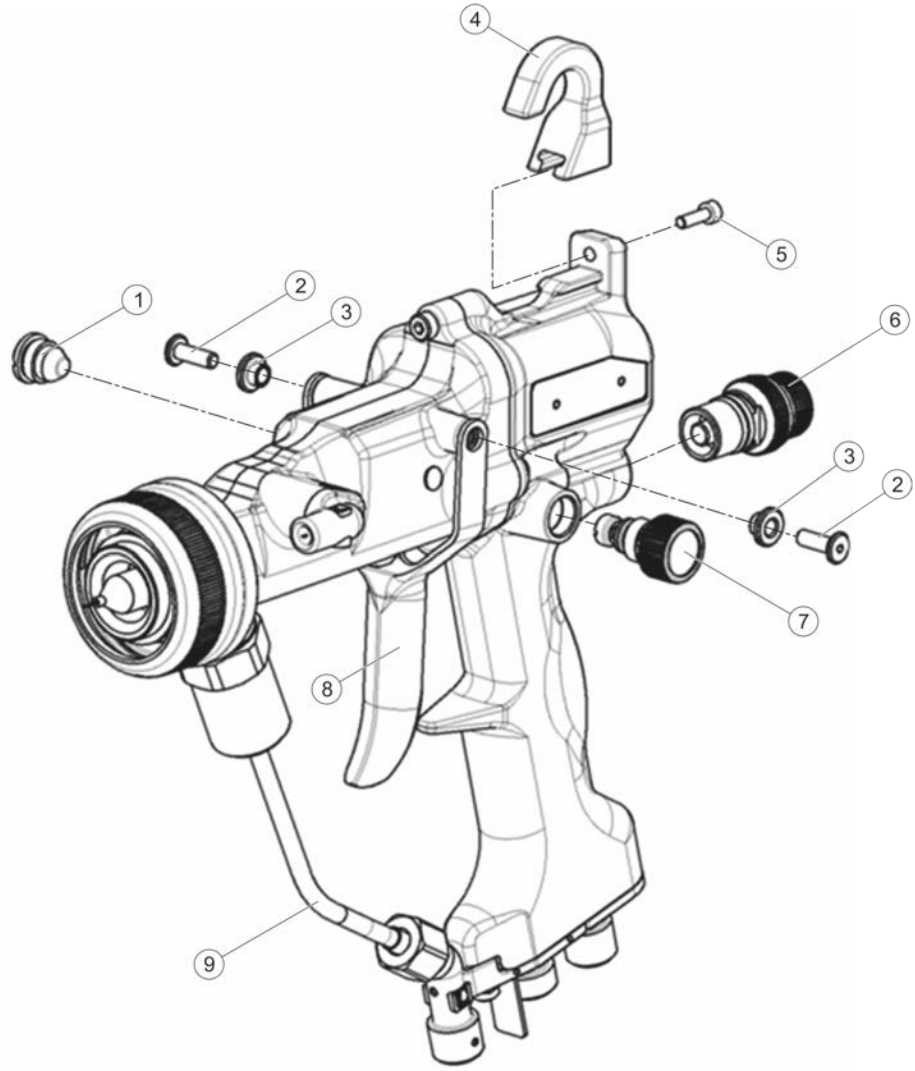

Fig. 51: Exploded view

Item	Denomination	Quan-tity	Material number
1	Plug	1	M48010274
2	Hex screw	2	M41010031
3	Collar bushing	2	M05020112
4	Hook	1	M19060021
5	Hex screw	1	M41010030
6	Adjusting screw, color	1	M41040155
7	Valve	1	M54990029
8	Trigger	1	M69040007
9	Pipe, set, straight	1	N36960222

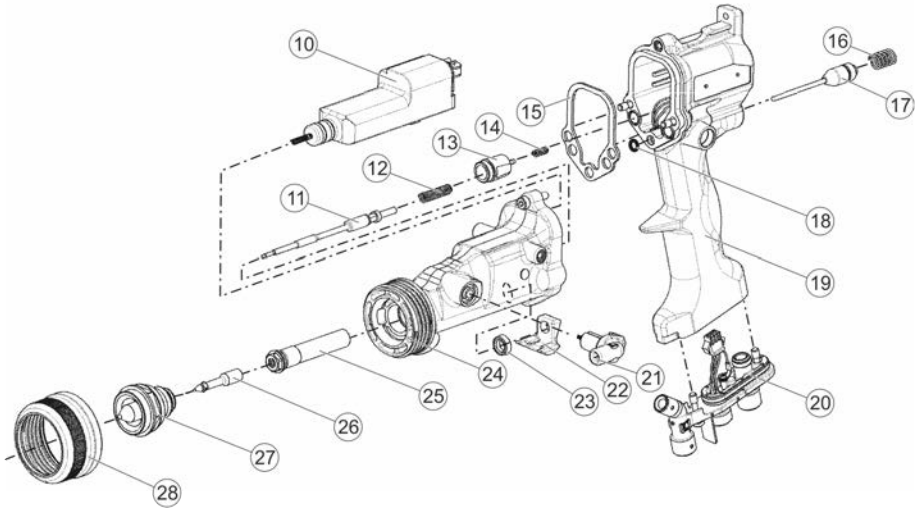

Fig. 52: Exploded view

Item	Denomination	Quan-tity	Material number
10	Cascade, complete	1	E10110015
11	Needle, set	1	N36960220
12	Compression spring	1	M68010283
13	Contact pin	1	M49090004
14	Compression spring	1	M68010284
15	Seal	1	M08280108
16	Compression spring	1	M68010285
17	Valve set, air	1	N36960226
18	Sealing ring	1	M08010561
19	Housing, set	1	N36960213
20	Handle, set	1	N36960216
21	Electrode, set	1	N36960208
22	Cover	1	M59012347
23	Sealing ring	1	M08010560
24	Basic housing	1	M16120035
25	Seal set	1	N36960207
26	Electrode needle, set	1	N36960080
27	Needle, set	1	N36960210
28	Cap nut, complete	1	M30090045

Screws

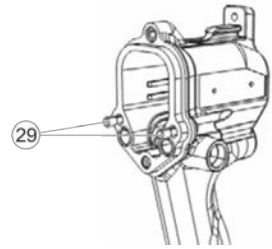

Fig. 53: Replacement parts, housing

Housing

Item	Denomination	Quantity	Material number
29	Hex screw	2	M41010033

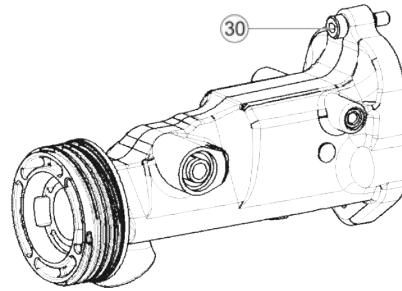

Fig. 54: Replacement parts, basic housing

Basic housing

Item	Denomination	Quantity	Material number
30	Hex screw	1	M41010033

Seals

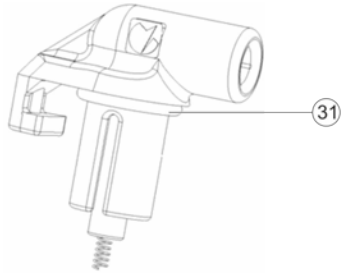

Fig. 55: Replacement parts, electrode

Electrode

Item	Denomination	Quantity	Material number
31	O Ring	1	M08030958

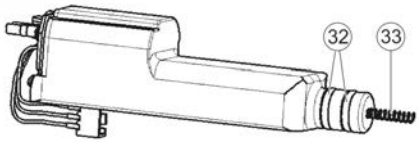

Fig. 56: Replacement parts, cascade

Cascade

Item	Denomination	Quantity	Material number
32	O Ring	2	M08030956
33	Spring	1	M68010291

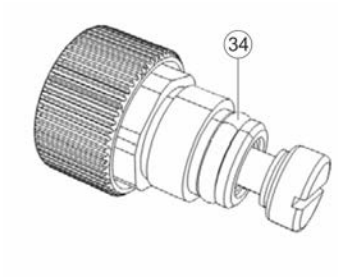

Fig. 57: Replacement part, valve

Valve

Item	Denomination	Quantity	Material number
34	O Ring	1	M08030952

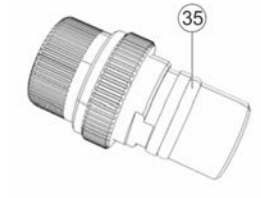

Fig. 58: Replacement parts, adjusting screw, color

Adjusting screw, color

Item	Denomination	Quantity	Material number
35	O Ring	1	M08030954

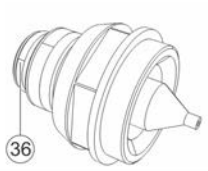

Fig. 59: Replacement parts, nozzle, color

Nozzle, color

Item	Denomination	Quantity	Material number
36	O Ring	1	M08030959

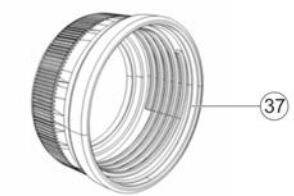

Fig. 60: Replacement parts, cap nut

Cap nut

Item	Denomination	Quantity	Material number
37	Sealing ring	1	M08010562

Handle

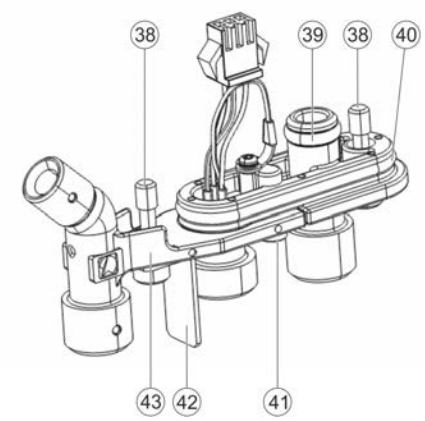

Fig. 61: Replacement parts, handle

Item	Denomination	Quan-tity	Material number
38	Hex screw	2	M41010033
39	O Ring	1	M08030953
40	O Ring	1	M08030955
41	Hex screw	2	M41010034
42	Stop	1	M47060304
43	Handle end A	1	N36960232

Tube

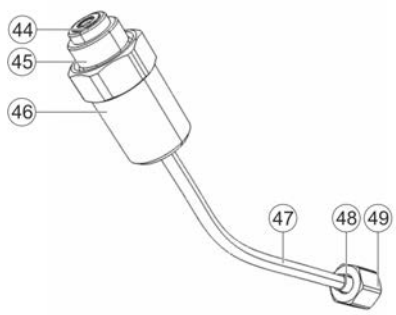

Fig. 62: Replacement parts, pipe

Pipe, straight

Item	Denomination	Quantity	Material number
44	Seal	1	M08280116
45	Connection	1	M01010241
46	Cover	1	M59012350
47	Pipe, straight	1	M34010667
48	Plug sleeve	1	M20050004
49	Nut	1	M30180068

Air cap overview

Air cap type	Item	Material number
HN400	–	M35030249
HN600		M35030250
HN800		M35030251

12.2 Tools

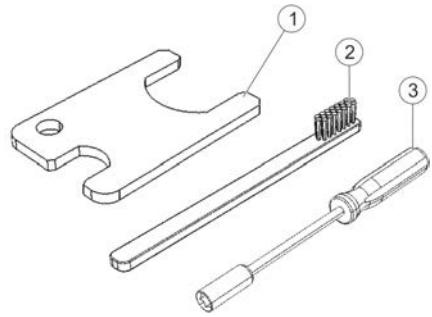

Fig. 63: Tool kit

Tool kit N36960228

Item	Denomination	Quantity	Material number
1	Open-end wrench	1	W09020020
2	Cleaning brush	1	W20020008
3	Box wrench	1	W11020037

12.3 Accessories

Denomination	Material number
Extension cable, plug connection, 10m	E09070247
Extension cable, plug connection, 20m	E09070248
Cleaning set (21 parts)	N36960038
Maintenance kit **Eco**Gun AS MAN DC/EC	N36960248
Quick change coupling for air G1/4" - external threads	N40030046

Denomination	Material number
Quick change coupling for paint G3/8" - external threads	N40040062
Push-on nipple for quick change coupling for paint G3/8" - internal threads	M58940013

Push-on nipple for quick-action coupling

Description	Material number
Push-on nipple for quick-action coupling, fixed D7, d10/12 (EU)	M01010185
Push-on nipple for quick-action, fixed D5 d8/11 (US)	M01010186
Push-on nipple for quick-action coupling, fixed D7.5 d11/13 (ASIA)	M01010187

12.4 Order

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the explosion protection specifications can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

WARNING!

Risk of injury from unsuitable replacement parts

Parts of third party suppliers may not bear the loads. Serious injuries and death can result.

– Only use original replacement parts.

Ordering replacement parts, tools and accessories as well as information on products that are listed without order number ↳ “Hotline and Contact”.

13 INDEX

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V

W

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