



LEADING IN PRODUCTION EFFICIENCY

EcoGun AS AUTO pro Automatic Air Spray Gun

Operation manual

MSG00005EN, V04



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:

N36210012V
EcoGun AS AUTO pro
and pro LVLP



Hotline and Contact

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

TABLE OF CONTENTS

1	Product overview	4	9.2	Defects table.....	19
	1.1 Overview.....	4	9.3	Troubleshooting.....	22
	1.2 Short description.....	4	9.3.1	Replace needle and nozzle.....	22
2	Safety	5	9.3.2	Replace needle seal.....	23
	2.1 Presentation of Notes.....	5	9.3.3	Set delay time.....	24
	2.2 Intended Use.....	5	9.3.4	Replace piston seals.....	25
	2.3 Staff qualification.....	6	10	Disassembly and Disposal	26
	2.4 Personal protective equipment.....	7	10.1	Safety recommendations...	26
	2.5 Residual risks.....	7	10.2	Disassembly.....	26
3	Transport, scope of supply and storage	8	10.3	Disposal	27
	3.1 Scope of delivery.....	8	11	Technical data	27
	3.2 Handling of packaging material.....	8	11.1	Dimensions and weight.....	27
	3.3 Storage.....	8	11.2	Connections.....	27
4	Assembly	8	11.3	Operating conditions.....	27
	4.1 Requirements for the Installation point.....	8	11.4	Emissions.....	27
	4.2 Assembly.....	8	11.5	Operating values.....	28
	4.3 Setting the spray jet.....	11	11.6	Type plate.....	28
5	Commissioning	11	11.7	Materials used.....	28
6	Operation	13	11.8	Operating and auxiliary materials.....	28
	6.1 Safety recommendations.....	13	11.9	Material specification.....	28
	6.2 General notes.....	13	12	Replacement parts, tools and accessories	29
	6.3 Rinsing.....	14	12.1	Replacement parts.....	29
	6.3.1 Safety recommendations..	14	12.2	Tools.....	37
	6.3.2 Rinsing.....	14	12.3	Accessories.....	38
7	Cleaning	14	12.4	Order.....	40
	7.1 Safety recommendations	14			
	7.2 Cleaning.....	15			
8	Maintenance	16			
	8.1 Safety notes.....	16			
	8.2 Maintenance schedule.....	17			
	8.3 Lubrication.....	18			
9	Faults	18			
	9.1 Safety recommendations	18			

1 Product overview

1.1 Overview

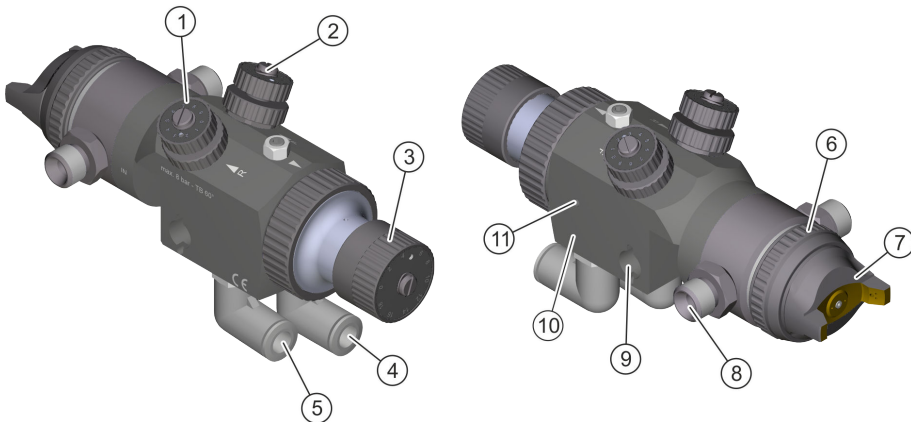


Fig. 1: Product overview

- 1 Atomizer air control (R)
- 2 Horn air control (F)
- 3 Material flow control
- 4 Control air connection (C)
- 5 Spraying air connection (A)
- 6 Cap nut

- 7 Air cap
- 8 Material connection
- 9 Fastening bore
- 10 Housing
- 11 Leakage bore

1.2 Short description

The spray gun is intended for surface coating. Compressed air is used to apply material. The coating material is fed through lines. The operation can be done with paint circulation or tap line.

The conventional air cap (CF) is used for decorative surfaces and an application with more focus on the atomization.

The features of the conventional air cap (CF) are:

- » Mist arm
- » Fine atomization
- » Transfer rate > 65 %

The conventional air cap (SF) is used for decorative surfaces and an application with more focus on the atomization.

The features of the conventional air cap (SF) are:

- » Suitable for low viscosity media
- » Low material outflow rate
- » Very fine atomization

The air cap LVLV (LF) is used for applications requiring a good transfer rate and spray pattern.

The features of the air cap LVLV are:

- » Mist arm
- » Transfer rate > 75 %

You can set a spray pattern from round to oval.

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

- » Alignment of the air cap
The alignment of the air cap determines the alignment of the spray jet.
- » Atomizer air pressure
The higher the atomizer air pressure, the higher the atomizing and the finer the spray jet
- » Horn air pressure
The higher the horn air pressure, the more oval is the spray jet.
- » Control air pressure
Opens the needle and controls the material outflow.
- » Material pressure
The higher the material pressure, the higher the material flow

Control air pressure is controlled externally via valves.

The horn air pressure and spraying air pressure can be adjusted on the spray gun by means of the horn air pressure (F) and the atomizer air control (R). The spraying air pressure (A) is controlled externally via valves.

You can also regulate the material flow via the material flow control, if it is not controlled externally. ↪ 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.



ENVIRONMENT!

Situations that can lead to environmental damage.



Additional information and recommendations.

2.2 Intended Use

Use

The **EcoGun AS AUTO pro/pro LVLP** spray gun is solely intended for automatic coating of surfaces by one of the following operating methods:

- » As independent, not hand guided device
- » As part of a semi- or fully automated paint booth
- » As part of a paint robot

The material feed can be effected optionally via the pressure line or under gravitation (flow beaker).

The product is only intended for use in industry and craftsmanship.

The use is only permitted within the specified technical data ↪ 11 “Technical data”.

The spray gun is approved for use in explosive areas of Ex zones 1 and 2.

Misuse

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

Examples of wrong use are:

- » Aiming the spray gun at humans or animals.
- » 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 areas Ex zone 0

EX labeling

 II 2G T6 X

- II - Device group II: all areas except mining
- 2G - Device category 2 for gas
- T6 - Temperature class T6: Surface temperature, max. 85°C
- X - Specific conditions for safe operation

The following conditions must be observed for safe operation:

- » Ground spray gun and work piece.
- » Only use conductive lines.
- » Ensure that static electricity can be discharged.

2.3 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 craftsmanship.

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.

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

2.4 Personal protective equipment

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



2.5 Residual risks

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.
- » Ground the spray gun.

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- » Spray gun Check regularly for leakage. Observe local regulations and maintenance schedule.
- » Ensure that the forced ventilation is operational.
- » Follow the safety data sheet.
- » 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.

Movable components

There is a risk of death if components or equipment in the vicinity move unexpectedly.

- » Switch off and lock out all system components against being switched on again before working on the product.

Noise

The sound pressure level during operation may cause severe hearing damage.

- » Wear ear protection.
- » Do not spend more time than necessary in the work area.

Hot surfaces

During normal operation the surfaces of components can get extremely hot. Contact with it can cause burns.

Before carrying out any work:

- » Check the temperature.
- » Do not touch hot surfaces.
- » Let components cool down.
- » Wear protective gloves.

3 Transport, scope of supply and storage

3.1 Scope of delivery

The scope of supply includes the following components:

- » Spray gun
- » Tool kit ↪ 12.1 "Replacement parts"

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

Storage provisions:

- » Do not store outdoors.
- » Store Spray gun only when dry.
- » Store in a dust-free place.
- » Do not expose to aggressive media.
- » Protect from solar radiation.
- » Avoid mechanical vibrations.
- » Temperature: 10°C to 40°C
- » Relative humidity: 35% to 90%

4 Assembly

4.1 Requirements for the Installation point.

- » The control air supply and the material feed to the spray gun must be interrupted and secured against reconnection.
- » Lines, seals and screw connections must be designed to conform to the requirements of the spray gun ↪ 11.5 "Operating values".
- » A support bracket capable of securing the spray gun is required.
- » The control air supply must be adjustable.
- » The control air supply must have venting.

4.2 Assembly

Stationary assembly

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Observe the following at assembly:

- » Diameter of the fastening bore: 10mm
- » Nominal diameters: ↪ 11.2 "Connections"

1.



WARNING!

Sources of ignition may cause explosions!

Ensure a non-explosive atmosphere.

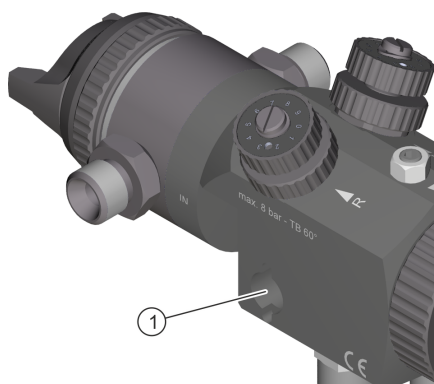



Fig. 2: Assembly

2. Push spray gun with the fastening bore (1) on the support bracket.

 Alignment is arbitrary. The distance to the work piece must be 15 to 25cm.

3.  **WARNING!**

Statically charges components may cause explosions during operation!

Ground the spray gun through the fastening bore or material connection lines, if the support bracket itself is non-conductive or is not grounded. Ensure housing contact.

» Resistance between housing and grounding terminal $\leq 1M\Omega$.

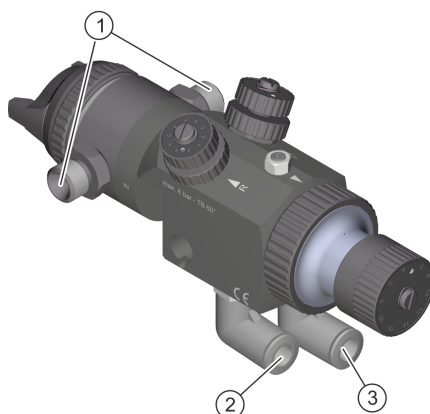





Fig. 3: Connect

4.  The spray gun does not work when the lines are not connected correctly.

Connect lines. Ensure correct assignment.

- 1 - Material (M)
- 2 - Spraying air (A)
- 3 - Control air (C)

 Connect lines to both material connections for paint circulation mode. For tap line mode, connect line to a material connection. Close the other material connection with the locking screw ( 12.3 "Accessories") supplied as accessory.

Robot assembly

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

For a robot assembly, the corresponding robot version of the spray gun must be used or the spray gun must be reconstructed with the components of the optional robot kit ↪ 12.3 "Accessories" for robot version. The regular inserts are exchanged here against connecting pieces.

The reconstruction and the connection of the robot version of the spray gun are described below.

1. **WARNING!**
Sources of ignition may cause explosions!

WARNING!
Statically charges components may cause explosions during operation!

Attach spray gun on the support bracket as for the stationary assembly and ground it properly ↪ "Stationary assembly".

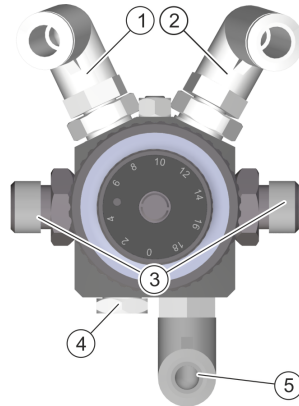


Fig. 4: Assembling robot accessories

2. Lock spraying air connection (A) with the blind plugs of the robot kits (4).
3. Replace regulating inserts of the atomizer air control (R) and the horn air control (F) by the regulating inserts and the screw-in plug connections of the robot kits (1 and 2).

4. The spray gun does not work when the lines are not connected correctly.

Connect lines. Ensure correct assignment.

- 1 - Atomizer air (R)
- 2 - Horn air (F)
- 3 - Material (M)
- 4 - Unused
- 5 - Control air (C)

Connect lines to both material connections for paint circulation mode. For tap line mode, connect line to a material connection. Close the other material connection with the locking screw (↪ 12.3 "Accessories") supplied as accessory.

4.3 Setting the spray jet

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

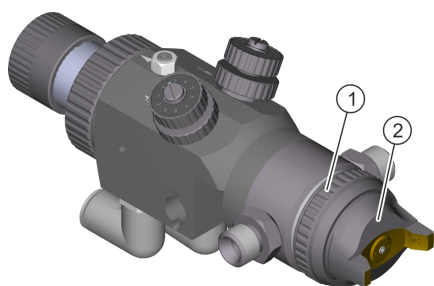


Fig. 5: Adjust spray jet

The orientation of the spray jet can be changed to any direction by rotating the air cap (2).

1. Lightly loosen the cap nut (1).

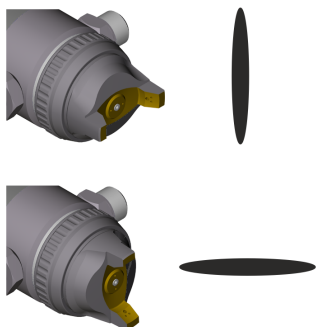


Fig. 6: Align air cap

2. Rotate air cap (2) into the required position.
3. Hand-tighten cap nut (1).

5 Commissioning

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Use ear protection
- » Eye protection
- » Respiratory protection device
- » Protective workwear
- » Protective gloves

Depending on the design of the application system, two technicians must be present to execute the commissioning:

- » Technician 1: Operates the controls.
 - » Technician 2: Check on the spray gun.
1. Actuate the spray gun without material via the control unit or the visualizer.
 2. Check the switching behavior.
 - » Does the needle open and close as required?
 - » Are all types of air supply connected?
 3. Purge spray gun ↪ 6.3 "Rinsing".
 4. Connect material.
 5. Create a trial spray pattern on a test work piece.

Setting the spray pattern

! NOTICE!

Wrong handling of the material flow control

If the material quantity is set using the material flow control, it must not be used for closing the material nozzle. Otherwise, cracks and fractures can occur on the material nozzle, ultimately leading to the failure of the spray gun.

- Do not use the material flow control for closing the nozzle.
- Close the material flow control by turning it only with slight force (two fingers). Do not continue turning it if resistance is increasing.

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Use ear protection
- » Eye protection
- » Respiratory protection device
- » Protective workwear
- » Protective gloves

You can adjust the spray pattern continuously between round and flat, by using horn air.

i You can vary the size of the spray pattern by adjusting the distance between the spray gun and the work piece.

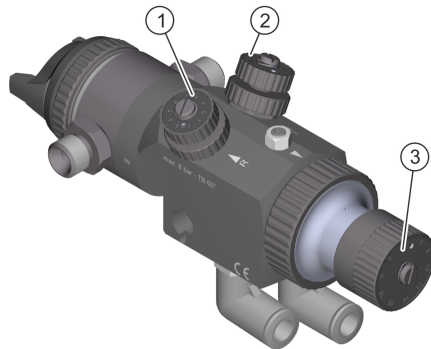


Fig. 7: Setting the spray pattern

1. Set material quantity via valves in control cabinet or at material flow control (3).

i Open the material flow control on the spray gun when controlling via the regulation cabinet.

2. Set atomizer air using valves in the control cabinet or on the atomizer air control (R) (1).

i Observe the following characteristic curve.

3. Set horn air using the horn air control (F) (2) or, in the case of robot assembly, using valves in the control cabinet.
 - ⇒ When the horn air is blocked, the spray pattern is round.

Characteristic curve

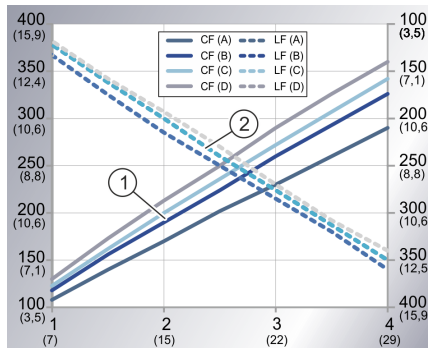


Fig. 8: Characteristic curve

- 1 Conventional air cap
- 2 Air cap LVLP
- A 0.5 to 0.8mm (CF)/0.5 to 1.2mm (LF)
- B 1.4 to 1.6mm (CF)/1.3 to 1.6mm (LF)
- C 1.8 to 2.5mm (CF and LF)
- D 3.0mm (CF and LF)
- X-Achse Spraying air pressure [bar (psi)]
- Y-Achse Flow rate [NI/min (CFM)]

The characteristic curves shows the relation between spraying air pressure and air consumption for four conventional air caps (CF) (1) and four air caps LVLP (LF)(2) with different diameters.

6 Operation

6.1 Safety recommendations



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 injury and death could be the consequence.

- Only use purging agents and cleaning agents that do not contain any halogenated hydrocarbons.



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 Rinsing

6.3.1 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.

6.3.2 Rinsing

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Use ear protection
- » Eye protection
- » Respiratory protection device
- » Protective workwear
- » Protective gloves

The spray gun must be rinsed:

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

Additional rinsing intervals depend on the material used.

1. Rinse the spray gun with an appropriate rinsing agent until the rinsing agent runs clean without any material residue.

7 Cleaning

7.1 Safety recommendations

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 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.
- Check grounding.

WARNING!

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Spray gun Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective clothing.
- Avoid contact (e.g. with eyes, skin).

**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.

**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 injury and death could be the consequence.

- Only use purging agents and cleaning agents that do not contain any halogenated hydrocarbons.

**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.

**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.

7.2 Cleaning

Clean spray gun

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Use ear protection
- » Eye protection
- » Respiratory protection device
- » Protective workwear
- » Protective gloves

1. Purge spray gun ↪ 6.3 “Rinsing”.
2. Use a cleaning agent to carefully clean the spray gun. Dry with a soft cloth.

Cleaning the air cap und nozzle

For a thorough cleaning you can remove the air cap and the nozzle.

Disassembly

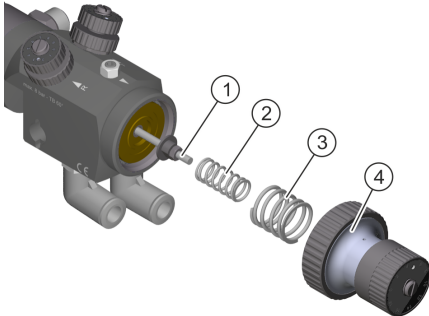


Fig. 9: Disassemble needle

1. Thread off and remove nozzle (4) with end cap.
2. Remove needle spring (2) and plunger spring (3).
3. Pull back complete needle (1) out of the housing.

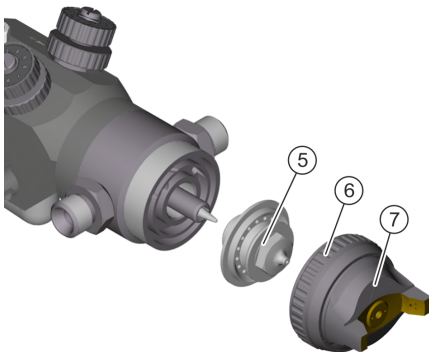


Fig. 10: Disassemble nozzle

4. Loosen the cap nut (6).

5. Remove cap nut (6) and air cap (7).
6. Remove the nozzle (5) with an open-end wrench (SW13).
7. Clean air cap using cleaning agent and cleaning brush ↻ 12.2 "Tools".
8. Wipe the cleaned air cap dry with a cloth.
9. Clean the nozzle in the cleaning bath.

Assembly

10. Insert and tighten nozzle (5).
 - » Tightening torque: 18 to 20Nm
11. Fit the cap nut (6) and air cap (7).
12. Align air cap (7).
13. Hand-tighten cap nut (6).
14. Lubricate needle shank lightly with silicone-free oil. Push in needle (1) carefully into the housing from the back.
15. Insert needle spring (2) and plunger spring (3).
16. Hand-tighten end cap (4).

8 Maintenance

8.1 Safety notes



WARNING!

Unsuitable replacement parts in explosive areas

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.



WARNING!

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Spray gun Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective clothing.
- Avoid contact (e.g. with eyes, skin).



CAUTION!

Risk of injury due to spring tension

The end cap of the spray gun is under spring tension. If you remove the end cap, the spring tension could cause the end cap to jump out unexpectedly and cause light injuries.

- Removing and installing end cap



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 maintenance intervals given below are based on experiential values. Maintenance intervals, adjust individually if necessary.

Interval	Maintenance work
Daily	Check condition and tightness (also of the connections and lines). Check fastening.
Before every change of material	Clean ↪ 7.2 "Cleaning".
Monthly	Lubricate internal components ↪ 8.3 "Lubrication".
After each alteration	Check grounding ↪ 4.2 "Assembly".

8.3 Lubrication

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Piston axis, needle shank, piston sleeve and piston glide surface in the gun housing must be lubricated every month so that there will not be any leakages.

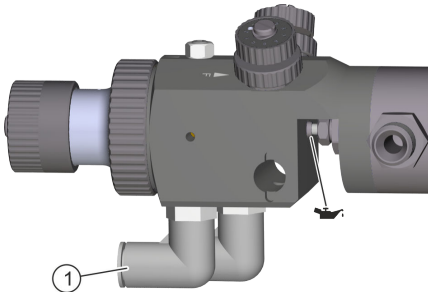


Fig. 11: Lubricate piston components

1. Feed lubricant (silicone-free oil) at the control air connection (C) (1) using control air.

9 Faults

9.1 Safety recommendations



CAUTION!

Risk of injury due to spring tension

The end cap of the spray gun is under spring tension. If you remove the end cap, the spring tension could cause the end cap to jump out unexpectedly and cause light injuries.

- Removing and installing end cap



NOTICE!

Property damage due to improper replacement of needle and nozzle

Replacing only the needle or only the nozzle could damage spray gun components. This can compromise the tightness of the spray gun. The spray pattern deteriorates.

- Observe order of replacement steps (needle – nozzle).
- Observe order of assembly steps (nozzle – needle).
- Always replace nozzle and needle at the same time.



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.

! NOTICE!

Improper setting causes damage





The delay time is factory-set. Setting a wrong delay time can damage the nozzle and the needle.



- You should only change the delay time upon inserting a new needle or in case there are problems with the spray pattern.

- If in doubt, contact Dürr Systems ↪ "Hotline and Contact".

9.2 Defects table

Visualizer of typical spray pattern problems

Spray pattern	Fault identification
	<p>Spray jet is distorted.</p>
	<p>Spray jet is bent or tapered.</p>
	<p>Spray jet is too thick in the middle.</p>
	<p>Spray jet is split.</p>

Spray pattern	Fault identification
	Spray jet is uneven.
	Spray jet is sickle-shaped.

Fault description	Cause	Remedy
No material	Line pinched or broken	Check the line.
	Needle does not open.	Check Control air.
Material leaking when needle is closed.	Needle does not close correctly.	Check control air venting. Check operation of needle. Replace needle, if defective, together with the nozzle ↪ 9.3.1 "Replace needle and nozzle."
	Nozzle soiled or defective	Clean and check the nozzle. If nozzle is defective, replace it along with the needle ↪ 9.3.1 "Replace needle and nozzle."
Air leaks from the material flow control	Piston sleeve worn out	Replace piston sleeve ↪ 9.3.4 "Replace piston seals."
Air leak from the leakage bore	O-rings of the piston worn out	Replace O-rings ↪ 9.3.4 "Replace piston seals."
	Sealing rings worn out	Have the sealing rings replaced by Dürr Systems.
Air leak between piston axis and housing	Lip seal worn out	Have the lip seal replaced by Dürr Systems. Or replace lip seal with assembly / disassembly tool for lip seal (↪ 12.2 "Tools").
Spray jet misaligned	Air cap is misaligned	Rotate air cap into the required position ↪ 4.3 "Setting the spray jet".
Spray jet too strong in center	Too much material	Reduce material feed. Increase spraying air pressure (A).
	Material too viscous	Change material consistency.

Fault description	Cause	Remedy
	Horn air pressure too low	Raise horn air pressure using the horn air control (F).
Split spray jet	Not enough material	Increase material feed. Reduce spraying air pressure (A).
	Material too thin	Change material consistency.
	Horn air pressure too high	Raise horn air pressure using the horn air control (F).
Cone-shaped spray jet	Bores in air cap are soiled	Clean and check air cap. Replace air cap if defective ↪ 7.2 "Cleaning".
	Nozzle soiled or defective	Clean and check the nozzle. If nozzle is defective, replace it along with the needle ↪ 9.3.1 "Replace needle and nozzle.".
Sickle-shaped spray jet	Bores in air cap are soiled	Clean and check air cap. Replace air cap if defective ↪ 7.2 "Cleaning".
	Nozzle soiled or defective	Clean and check the nozzle. If nozzle is defective, replace it along with the needle ↪ 9.3.1 "Replace needle and nozzle.".
	Cap nut or nozzle is not properly tightened	Tighten cap nut and nozzle ↪ 7.2 "Cleaning".
Uneven spray jet	Nozzle soiled or defective.	Clean and check the nozzle. If nozzle is defective, replace it along with the needle ↪ 9.3.1 "Replace needle and nozzle.".
	Material pressure too low.	Increase material pressure.
	Infeed line pinched or broken	Check infeed line.
	Needle does not close correctly.	Check Control air. Check operation of needle. Replace needle, if defective, together with the nozzle ↪ 9.3.1 "Replace needle and nozzle.".
	Cap nut or nozzle is not properly tightened	Tighten cap nut and nozzle ↪ 7.2 "Cleaning".
	Needle seal worn out	Replace needle seal ↪ 9.3.2 "Replace needle seal".

Fault description	Cause	Remedy
Formation of large drops	Delay time too short	Set delay time ↪ 9.3.3 "Set delay time".

9.3 Troubleshooting

9.3.1 Replace needle and nozzle.

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Disassembly

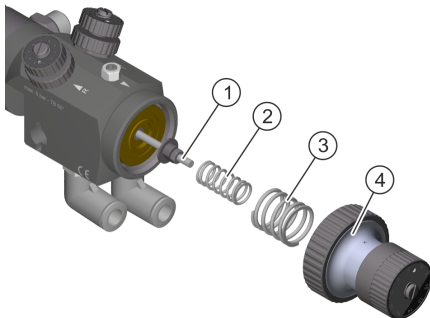


Fig. 12: Disassemble needle

1. Thread off and remove nozzle (4) with end cap.
2. Remove needle spring (2) and plunger spring (3).
3. Pull back complete needle (1) out of the housing.

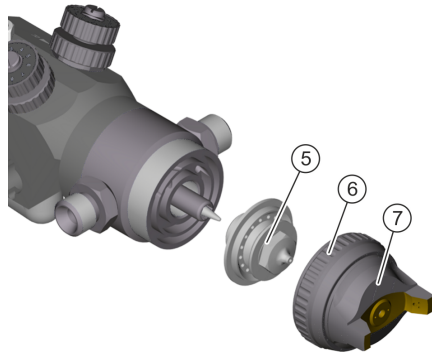


Fig. 13: Disassemble nozzle

4. Loosen the cap nut (6).
5. Remove cap nut (6) and air cap (7).
6. Remove the nozzle (5) with an open-end wrench (SW13).
7. Replace worn out or defective components.

Assembly

8. Insert and tighten nozzle (5).
 - » Tightening torque: 18 to 20Nm



Depending on the use case, use a nozzle with a suitable diameter.

9. Fit the cap nut (6) and air cap (7).
10. Align air cap (7).
11. Hand-tighten cap nut (6).

Faults

12. Lubricate needle shank lightly with silicone-free oil. Push in needle (1) carefully into the housing from the back.
13. Insert needle spring (2) and plunger spring (3).
14. Hand-tighten end cap (4).

9.3.2 Replace needle seal

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Disassembly

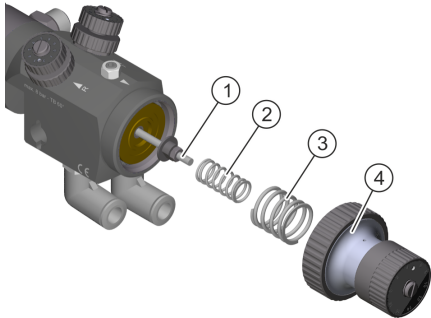


Fig. 14: Disassemble needle

1. Thread off and remove nozzle (4) with end cap.
2. Remove needle spring (2) and plunger spring (3).
3. Pull back complete needle (1) out of the housing.

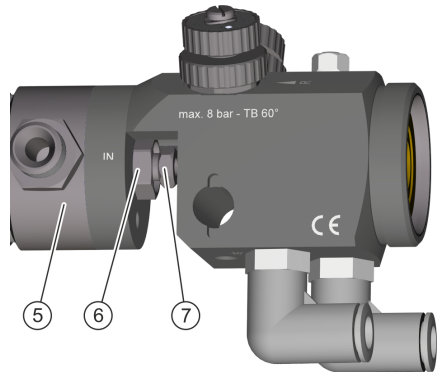


Fig. 15: Disassemble needle seal

4. Unscrew custom nut (6) using open-end wrench (14mm).
5. Pull out connector (5). Collect custom nut (6).
6. Screw off needle plug (7).

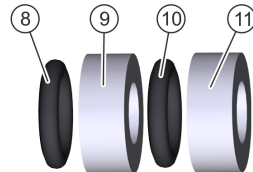


Fig. 16: Remove seals

7. Remove needle seals (9 and 11) and O-rings (8 and 10).
8. Use a cleaning agent to clean the contact face of the needle seal (9 and 11).

Assembly

9. Insert needle seals (9 and 11) and O-rings (8 and 10) in the illustrated sequence.
10. Screw-on needle plug (7) loosely.

11. Insert connecting piece (5).
12. Thread in and screw custom nut (6).
13. Lubricate needle shank lightly with silicone-free oil. Push in needle (1) carefully into the housing from the back.
14. Insert needle spring (2) and plunger spring (3).
15. Hand-tighten end cap (4).
16. Tighten needle gland (7) sensitively.

9.3.3 Set delay time

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Disassembly

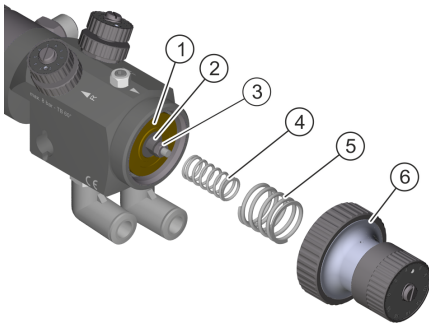


Fig. 17: Set delay time

1. Thread off and remove nozzle (6) with end cap.
2. Remove needle spring (4) and plunger spring (5).

3. Loosen locknut (3).

Setting

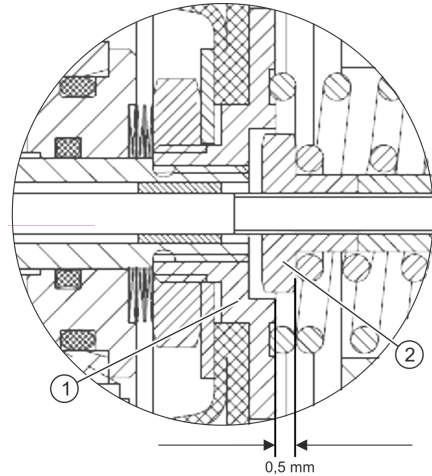


Fig. 18: Adjust distance from piston holder to pre-air stop nut.

4. Rotate pre-air stop nut (2).
 - » Turn it to the right to reduce the delay time.
 - » Turn it to the left to increase the delay time.



The recommended distance from the pre-air stop nut (2) to the piston holder (1) is about 0.5mm. If a longer delay is needed, the distance must be increased.

5. Tighten the locknut (3).

Assembly

6. Insert needle spring (4) and plunger spring (5).
7. Hand-tighten end cap (6).

Faults

9.3.4 Replace piston seals.

Personnel:

- » Operator
- » + additional qualification explosion protection

Protective equipment:

- » Protective workwear
- » Protective gloves

Disassembly

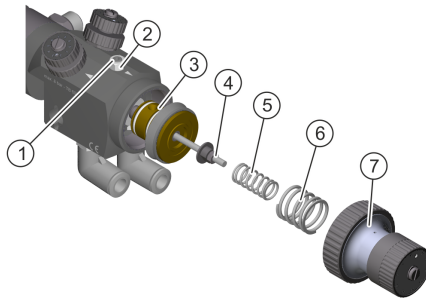



Fig. 19: Disassembling Piston

1. Thread off and remove nozzle (7) with end cap.
2. Remove needle spring (5) and plunger spring (6).
3. Pull back complete needle (4) out of the housing.
4. Loosen hex nut (2).
5. Thread off and remove screw (1).
6. Pull out the complete piston axis (3).

 For simpler disassembly, a M5 screw can be screwed into the piston axis (3).

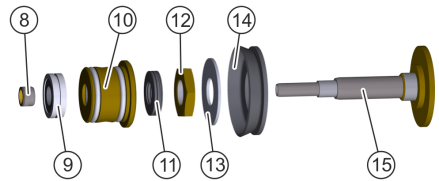



Fig. 20: Replace piston seals

7. Loosen locknut (8).
8. Pull out sealing body (9) from piston axis (15).
9. Pull off stop bush (10).
10. Pull off ball bearing plate springs (11).
11. Loosen bracket nut (12).
12. Pull off counter-washer (13).
13. Pull off piston sleeve (14).
14. Replace seals of the stop bush (10), sealing body (9) and piston sleeve (14).

 Worn out sealing rings, which are inside of the stop bush, need to be replaced by Dürr Systems.

Assembly

15. Use a drop of oil to wet the piston axis (15).
16. Push piston sleeve (14) and counter-washer (13) on to the piston axis (15).
17. Insert and tighten bracket nut (12).
18. Push ball bearing plate springs (11) and stop bush (10) on to the piston axis (15).
19. Push sealing body (9) on to the piston axis (15).
20. Insert and tighten locknut (8).

21. Lubricate piston sleeve (14) and piston glide surface in the housing lightly with silicone-free oil.

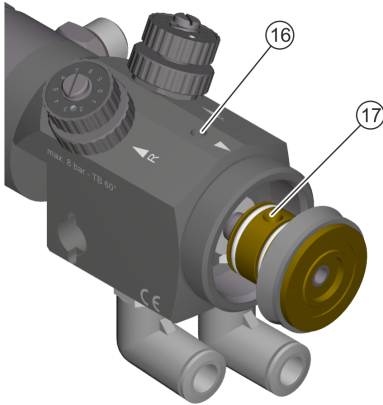


Fig. 21: Insert piston axis

22. Ensure that the tapering bore of the piston axis (17) is perpendicular to the tapped hole (16) in the housing.
23. Push in complete piston axis from behind into the housing.
24. Thread-in the screw (1).
25. Screw-on hex nut (2) and tighten it.
26. Lubricate needle shank lightly with silicone-free oil. Push in needle (4) carefully into the housing from the back.
27. Insert needle spring (5) and plunger spring (6).
28. Hand-tighten end cap (7).

10 Disassembly and Disposal

10.1 Safety recommendations



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 explosion protection

Protective equipment:

- » Use ear protection
- » Eye protection
- » Respiratory protection device
- » Protective workwear
- » Protective gloves

1. Rinsing ↻ 6.3 "Rinsing".
2. Disconnect the compressed air supply and material feed. Secure against reconnection.
3. Disconnect all lines.
4. Disassemble the spray gun from the support bracket.

10.3 Disposal



ENVIRONMENT!

Improper waste disposal

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

- Clean components before their disposal.
- Always dispose of components in accordance with their characteristics. ↪ 11.7 “Materials used”
- Collect leaked out utilities and auxiliaries completely.
- Dispose of work equipment soaked in coating materials or operating substances according to the disposal provisions in force.
- Dispose of utilities and auxiliaries 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

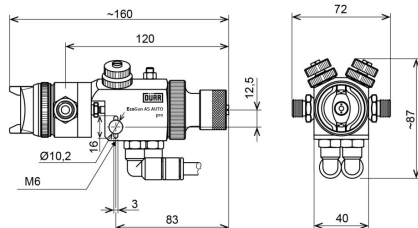


Fig. 22: Dimensions

Detail	Value
Length	approx. 160mm
Width	72mm

Detail	Value
Height	approx. 87mm
Weight	850g
Nozzle diameter (with CF air cap and LVLP air cap)	0.5 to 3.0mm
Nozzle diameter (with SF air cap)	0.5 to 1.2mm

11.2 Connections

Connection	Nominal width
Material (2x)	1/4" thread
Control air and spraying air (version -dependent)	Control air Ø 6mm or Ø 4mm or Ø 1/4" Spraying air: Ø 8mm or Ø 3/8"

11.3 Operating conditions

Detail	Value
Ambient temperature, minimum	2°C
Ambient temperature, maximum	55°C

11.4 Emissions

Detail	Value
Emission sound pressure level L_{pA} , A – according to EN 14462	76dB
Uncertainty K_{pA}	5dB
Sound power level L_{WA} , A – according to EN14462	-
Uncertainty K_{WA}	-

11.5 Operating values

Detail	Value
Air consumption of spraying air (pro)	240 to 270 NI/min
Air consumption of spraying air (pro LVLP)	260 to 305 NI/min
Spraying air pressure, maximum	8 bar
Spraying air pressure, optimum	2.0 to 2.5 bar
Control air pressure	3.5 to 6 bar
Material pressure, maximum	4 bar
Material temperature, maximum	60°C

Quality of compressed air

- » Purity classes ISO 8573-1:2010 1:4:1
- » Limitations for purity class 4 (pressure dew point max.):
 - » ≤ -3 °C at 7 bar absolute
 - » $\leq +1$ °C at 9 bar absolute
 - » $\leq +3$ °C at 11 bar absolute

11.6 Type plate

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

- » Product designation
- » Material number
- » Year of manufacture
- » Serial number
- » EX labelling
- » Manufacturer
- » CE labelling

11.7 Materials used

Component	Material
Housing	Nickel plated aluminum
Compression springs	Stainless steel
Materials in contact with material	Stainless steel
Seals in contact with material	PTFE, FEPM
Seals without material contact	NBR

11.8 Operating and auxiliary materials

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

11.9 Material specification

Suitable Material:

- » Flammable and inflammable coating materials



Do not use halogen - hydrocarbon based material.

12 Replacement parts, tools and accessories

12.1 Replacement parts

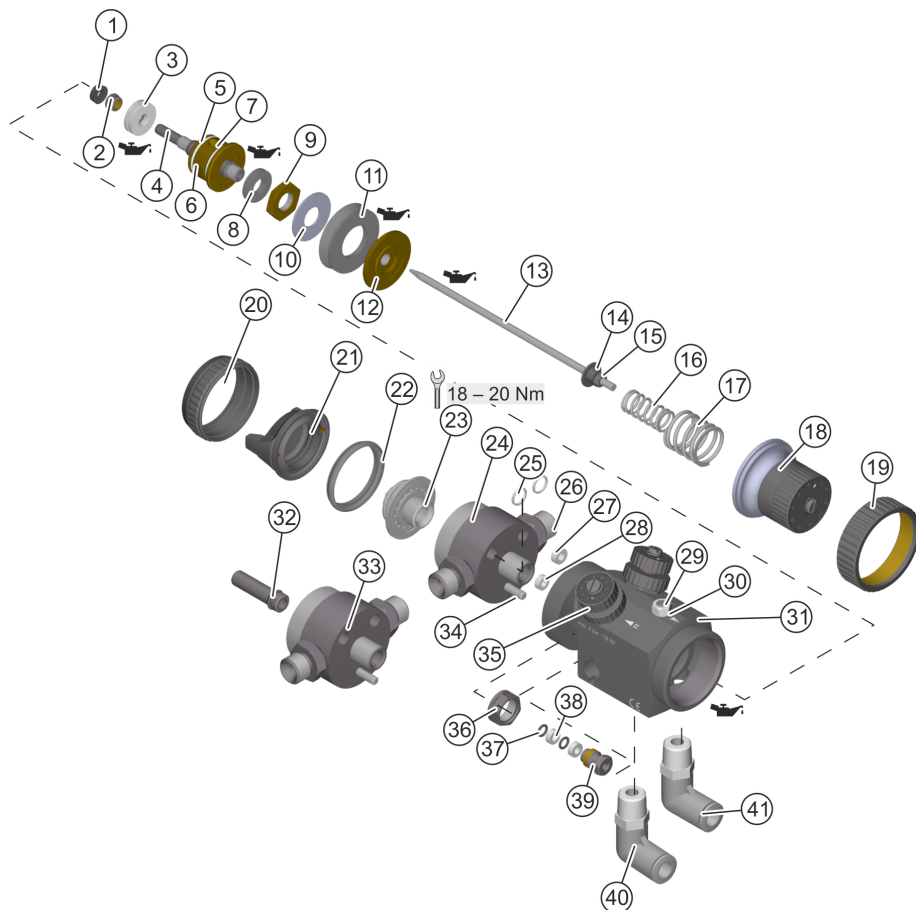


Fig. 23: Exploded view

Klüber Syntheso GLEP 1

Item	Denomination	Quantity	Material number	
1	Lip seal 5.0 x 9.0 x 2.9	1	↳ "Spare part sets"	
2	Locknut	1	M67010082	
3	Sealing body	1	M67010082	
4	Piston axis	1		
5	Sealing ring	2		
6	Stop bush	1		
7	O-ring 16.0 x 2.0	2		
8	Ball bearing plate spring	6		
9	Bracket nut	1		
10	Counter-washer	1		
11	Piston sleeve	1		
12	Piston holder	1		
13	Needle	1		Included in the nozzle set ↳ "Overview - Air caps and nozzles"
14	Pre-air stop nut	1		
15	Locknut	1		
16	Needle spring	1	M68010223	
17	Plunger spring	1	M68010224	
18	End cap	1	M25010065	
19	Cap nut	1		
20	Cap nut	1	↳ "Overview - Air caps and nozzles"	
21	Air cap	1		
22	Seal 36.0 x 33.0 x 3.5	1	M08280029	
23	Nozzle	1	↳ "Overview - Air caps and nozzles"	
24	Connecting piece	1	M01010207	
25	Seal 9.0 x 7.5 x 1.0	2	M08010522	
26	Double nipple	2	M56110426	
27	Sleeve inside Ø 3.4 (only pro LVLP, horn air)	1	M57930018	

Item	Denomination	Quantity	Material number
28	Sleeve inside Ø 2.3 (only pro LVLP, atomizer air)	1	M57930016
29	Threaded pin	1	D09140095
30	Hex nut	1	D09340024
31	Housing	1	-
32*	Paint guide sleeve	1	M01010210
33*	Connector M36x1 D40 L41	1	M34040021
34	Cylinder pin Ø 4x20	1	-
35	Control screw	2	M57930010
36	Tightening nut	1	M30050073
37	O-ring 4.0 x 1.2	2	M08220019
38	Needle seal	2	
39	Needle gland	1	M08320002
40	Elbow (spraying air A)	1	M57310089 (Ø 8) or M55170052 (Ø 3/8")
41	Elbow (control air C)	1	M55170053 (Ø 6) or M57310085 (Ø 4) or M55170051 (Ø 1/4")

Paint guide sleeve with connection for self-setting materials, is installed instead of connector (24).

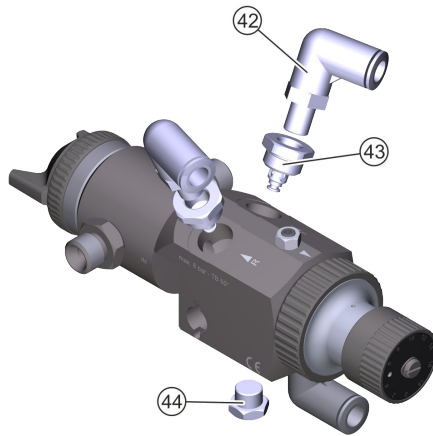


Fig. 24: Exploded view robot accessories

Item	Denomination	Quantity	Material number
42	Elbow plug-in connection	2	↳ 12.3 "Accessories"
43	Regulator insert	2	
44	Sealing screw 1/4"	1	

Overview - Air caps and nozzles



Nozzle sets consist of needle and nozzle with or without air cap.

Nozzle sets with air cap

Nozzle diameter	Item	Nozzle set conventional (CF)	Nozzle set conventional (SF)	Nozzle set LVLP (LVLP)
0.5mm	13, 14, 15, 20, 21, 22, 23	M09800210	M09800211	M09800225
0.8mm		M09800212	M09800213	M09800226
1.0mm		M09800214	M09800215	M09800227
1.2mm		M09800216	M09800397	M09800228
1.3mm		M09800217	-	M09800229

Nozzle diameter	Item	Nozzle set conventional (CF)	Nozzle set conventional (SF)	Nozzle set LVLP (LVLP)
1.4mm		M09800218		M09800230
1.5mm		M09800219		M09800231
1.6mm		M09800220		M09800232
1.8mm		M09800221		M09800233
2.0mm		M09800222		M09800234
2.5mm		M09800223		M09800235
3.0mm		M09800224		M09800236

Nozzle sets TiN* with air cap

Nozzle diameter	Item	Nozzle set conventional (CF)	Nozzle set LVLP (LVLP)
0.5mm	13, 14, 15, 20, 21, 22, 23	M09800296	M09800284
0.8mm		M09800297	M09800285
1.0mm		M09800298	M09800286
1.2mm		M09800299	M09800287
1.3mm		M09800300	M09800288
1.4mm		M09800301	M09800289
1.5mm		M09800302	M09800290
1.6mm		M09800303	M09800291
1.8mm		M09800304	M09800292
2.0mm		M09800305	M09800293
2.5mm		M09800306	M09800294
3.0mm		M09800307	M09800295

* Nozzle and needle coated with titanium nitride (TiN) to increase the service life.

Nozzle sets without air cap

Nozzle diameter	Item	Nozzle set conventional (CF) and LVLP (LF)	Nozzle set conventional (SF)
0.5mm	13, 14, 15, 23	M09800332	M09800398
0.8mm		M09800333	M09800399
1.0mm		M09800334	M09800400
1.2mm		M09800335	M09800401
1.3mm		M09800336	-
1.4mm		M09800337	
1.5mm		M09800338	
1.6mm		M09800339	
1.8mm		M09800340	
2.0mm		M09800341	
2.5mm		M09800342	
3.0mm		M09800343	

Nozzle sets TiN* without air cap

Nozzle diameter	Item	Nozzle set conventional (CF) and LVLP (LF)
0.5mm	13, 14, 15, 23	M09800344
0.8mm		M09800345
1.0mm		M09800346
1.2mm		M09800347
1.3mm		M09800348
1.4mm		M09800349
1.5mm		M09800350
1.6mm		M09800351
1.8mm		M09800352
2.0mm		M09800353

Nozzle diameter	Item	Nozzle set conventional (CF) and LVLP (LF)
2.5mm		M09800354
3.0mm		M09800355

* Nozzle and needle coated with titanium nitride (TiN) to increase the service life.

Conventional air cap (CF)

Nozzle diameter	Item	Material number
0.5 to 0.8mm	20, 21, 22	M35030174
1.0 to 1.2mm		M35030175
1.3 to 1.6mm		M35030176
1.8 to 2.5mm		M35030177
3.0mm		M35030178

Conventional air cap (SF)

Nozzle diameter	Item	Material number
0.5 to 0.8mm	20, 21, 22	M35030179
1.0 to 1.2mm		M35030180

Air cap LVLP (LF)

Nozzle diameter	Item	Material number
0.5 to 1.2mm	20, 21, 22	M35030170
1.3 to 1.6mm		M35030171
1.8 to 2.5mm		M35030172
3.0mm		M35030173

Spare part sets

Seal set N36960097

Denomination	Item	Quantity
Sealing ring 9.2 x 7.0 x 2.5 for control screw	-	2
Lip seal 5.0 x 9.0 x 2.9*	1	1
Locknut	2	1
Sealing body	3	1

Denomination	Item	Quantity
Sealing ring	5	2
O-ring 16.0 x 2.0	7	2
Piston sleeve	11	1
Seal 36.0 x 33.0 x 3.5	22	1
Sealing ring 9.0 x 7.5 x 1.0	25	2
O-ring 4.0 x 1.2	37	2
Needle seal	38	2

* Tool W02850035 is required for disassembling a worn out lip seal. In addition, a contact adhesive (cyanacrylate) is required for assembly.

Repair kit N36960098

Denomination	Item	Quantity
Seal set N36960097	-	1
Piston with piston axis, complete	2 to 12	1
Pre-air stop nut	14	1
Locknut	15	1
Needle spring	16	1
Plunger spring	17	1
Control screw	35	1
Needle gland	39	1

Piston axis complete, pre-assembled M67010082

Denomination	Item	Quantity
Locknut	2	1
Sealing body	3	1
Piston axis	4	1
Sealing ring	5	2
Stop bush	6	1

Denomination	Item	Quantity
O-ring 16.0 x 2.0	7	2
Ball bearing plate spring	8	6
Bracket nut	9	1
Counter-washer	10	1
Piston sleeve	11	1
Piston holder	12	1

Sealing collar set M08220019

Denomination	Item	Quantity
O-ring 4.0 x 1.2	37	2
Needle seal	38	2

12.2 Tools

Denomination	Item	Material number
Assembly / disassembly tool for lip seal (1)	–	W02850035

Tool and connection set N36960129

Denomination	Item	Quantity
Cap nut, hexagonal for screw connection 1/4"	-	2
Screw connection 1/4" for material hose 6x8		2
Open-end wrench double SW 6/7		1
Open-end wrench double SW 7/9		1
Open-end wrench double SW 13/14		1
Ball valve R 1/4" i/o		1
Cheese-head screw M6x20 DIN912 8.8 z St		1
Hex screw M10x90 DIN933		1

Denomination	Item	Quantity
Hexagonal nut M10 DIN934 8 Z St		3
Seal 1/4"		2

12.3 Accessories



A complete overview of the accessories is available from the Dürr Webshop.

Denomination	Item	Quantity	Material number
Cleaning set (21 parts)	-	1	N36960038
Flexible protective sleeve for spray gun	-	1	W20910224
Plastic cover for needle and needle seal, protection for snap-in attachment	-	1	M59012317

Robot kit EU N36960141

Denomination	Item	Quantity	Material number
Elbow plug-in connection for air hose Ø 8	42	2	M57310090
Regulator insert	43	2	
Sealing screw 1/4"	44	1	

Robot kit US N36960142

Denomination	Item	Quantity	Material number
Elbow plug-in connection for air hose Ø 3/8"	42	2	M55170054
Regulator insert	43	2	
Sealing screw 1/4"	44	1	

Sealing screw for tap line mode

Denomination	Item	Quantity	Material number
Sealing screw G1/4" SW 17 L19.5	-	1	M41090179

Closure set for operation without horn air

Denomination	Item	Quantity	Material number
Closure set	-	1	N36960148

Support bracket

Denomination	Item	Quantity	Material number
Support bracket for stand tube Ø 26	-	1	N66030005
Gun support bracket with angular gauge	-	1	M33120007

Elbow fitting

Denomination	Item	Quantity	Material number
90°-elbow union G1/4" – 1/4" NPSM in stainless steel, adjustable	-	1	M55030173
90°-elbow union G1/4" – G1/4" in stainless steel, adjustable	-	1	M55030171
90°-elbow connection set for material hose 4x6, adjustable	-	1	N36960192

Feed cup (for material supply via feed cup)

Denomination	Item	Quantity	Material number
Feed cup connection G1/4" – G3/8", complete	-	1	N36960186
Feed cup, plastic, G3/8" with filter, 600mL	-	1	N08010034
Feed cup, plastic, G3/8" with filter, 125mL	-	1	N08010032

12.4 Order

**WARNING!****Unsuitable replacement parts in explosive areas**

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

**WARNING!****Unsuitable replacement parts**

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

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

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Translation of the original operation manual

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