GB
Operating instructions
Automatic spray gun Mikro 3

Item number: 200-0152 • 200-0154 • 200-0190
Translation of the original operating instructions

Krautzberger
Thank you for selecting a Krautzberger product.

This product has been manufactured following state-of-the-art manufacturing procedures and extensive quality assurance measures. We promise you a product of the highest quality.

If you have questions, requests or suggestions, please contact us. We are always glad to assist you.

**Information about the operating manual**

This manual provides important information on how to work with the device safely and efficiently. The manual is part of the device and must always be kept in the immediate proximity of the device so that it is accessible to the personnel at all times.

The personnel must have read and understood this manual before starting any work. Compliance with all specified safety information and instructions is a basic requirement for safe working conditions.

In addition, the local occupational safety regulations and general safety rules apply for the area of application of the device.

Due to optional finishing variants, it is possible that the figures shown in this operating manual deviate from your device.

**Information about explosion protection**

Many of our competitors have been marking their products with the Ex symbol as a matter of principle for some time now.

At Krautzberger we do not do that.

We engineer and manufacture our products in line with currently applicable directives.

If the labelling on the product is required, it is affixed to the product as the result of the necessary analysis of ignition sources. If no labelling is affixed, the analysis of ignition sources and previous experience with the assessment of the suitability of products for use in a potentially explosive area have shown that the product described in this operating manual does not represent a potential source of ignition, with the exception of an electrostatic charge.

Taking into account the potential equalisation (provided by proper earth connection), the use in an area at risk for explosions is permitted in accordance with the currently valid directives.
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# 1 Function and identification

## 1.1 Function

Automatic spray guns are used for:

- automatic coating/marking of surfaces
- dosing of fluids
- placement of adhesive or marking points

Typical spray fluids are paints, dyes, adhesives, glazes, enamels, release agents, etc.

The spray medium is fed into the automatic spray gun under pressure. This pressure is typically generated by pumps or pressure containers. The automatic spray gun is controlled via compressed air.

For the precise control of the automatic spray gun, electrically-activated solenoid valves can be used.

Upon opening the control, the control piston charged with compressed air first opens the atomizer air valve and then with a short delay the fluid nozzle of the automatic spray gun. Upon closing the control, first the fluid nozzle and then the atomizer air valve is closed in order to prevent a subsequent dripping of the spray fluid.

The spray medium is atomized using compressed air. The geometry of the spray jet and the sprayed quantity of the spray medium can be adjusted with the following measures:

- Selection of air and fluid nozzle
- Changing of atomizer air pressure
- Changing of spray medium pressure
- Adjustment of the needle stroke on the regulator of the spray gun

The automatic spray gun consists of the following materials:

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head piece</td>
<td>Stainless steel or anodised aluminium</td>
</tr>
<tr>
<td>Control section</td>
<td>Aluminium anodised/hard-coated</td>
</tr>
<tr>
<td>Main element</td>
<td></td>
</tr>
<tr>
<td>Needle</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>Seals</td>
<td>Rubber and plastic</td>
</tr>
</tbody>
</table>

## 1.2 Identification

### Scope of delivery

<table>
<thead>
<tr>
<th>Type</th>
<th>Nozzle size</th>
<th>Item number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat/round jet</td>
<td>M24 x 1</td>
<td>200-0152</td>
</tr>
<tr>
<td>Round jet</td>
<td>M14 x 0.75</td>
<td>200-0154</td>
</tr>
</tbody>
</table>
### Scope of delivery

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th><strong>Nozzle size</strong></th>
<th><strong>Item number</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dosing nozzle</td>
<td>M8 x 0.75</td>
<td>200-0190</td>
</tr>
<tr>
<td>Operating manual</td>
<td></td>
<td>T-Dok-220</td>
</tr>
</tbody>
</table>

### Serial number

The serial number of the automatic spray gun is located on the main element. It serves as a unique identifier.
2 Using this operating manual

2.1 Information about the operating manual
- Knowledge of the fundamental safety instructions and safety regulations is a basic requirement for safe handling and defect-free operation of the product.
- This operating manual contains the most important information about enabling safe operation of the product.
- This operating manual and, in particular, the safety instructions are to be observed by all persons who work on or with the product.
- Furthermore, the rules and regulations for accident prevention in force at the respective operating site are to be observed.

2.2 Symbols in this operating manual

Safety instructions

This operating manual uses symbols to identify safety instructions. The safety instructions are preceded by signal words that indicate the severity of the hazard.

- **DANGER!**
  This combination of symbol and signal word indicates an immediate dangerous situation, which will cause death or severe injuries if it is not averted.

- **WARNING!**
  This combination of symbol and signal word indicates a potentially dangerous situation which can cause death or severe injuries if it is not averted.

- **CAUTION!**
  This combination of symbol and signal word indicates a potentially dangerous situation which can cause slight injuries if it is not averted.

- **NOTICE!**
  This combination of symbol and signal word indicates a potentially dangerous situation which can cause property and environmental damage if it is not averted.
Tips and recommendations

This symbol highlights useful tips and recommendations as well as information for efficient and defect-free operation.

Example for safety instructions in operating instructions

Safety instructions can refer to specific, individual operating instructions. Such safety instructions are embedded in the operating instructions so that they do not disrupt the reading flow when performing the action. The signal words described above are used.

1. Loosen the screw.
2. **CAUTION!** Pinching hazard at the lid!
   Carefully close the lid.
3. Tighten the screw.

Special safety instructions

The following symbols are used in safety instructions to draw attention to specific hazards:

<table>
<thead>
<tr>
<th>Warning signs</th>
<th>Type of danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚠️</td>
<td>Warning – danger zone.</td>
</tr>
</tbody>
</table>

Additional markings

The following markings are used in this manual to highlight operating instructions, outcomes, lists, references, and other elements:

<table>
<thead>
<tr>
<th>Identification</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>→</td>
<td>Step-by-step instructions</td>
</tr>
<tr>
<td>⇐</td>
<td>Results of procedural steps</td>
</tr>
</tbody>
</table>
2.3 Personnel requirements

This manual identifies the qualifications of the personnel for the different scopes of work as listed below:

Qualified personnel
Due to their specialised professional training, knowledge, and experience as well as knowledge of the industry-specific standards and regulations, qualified personnel are in a position to perform assigned tasks and to identify and avert potential risks on their own.

Specialised personnel
Due to their specialised professional training, knowledge, and experience as well as knowledge of the industry-specific standards and regulations, qualified personnel are in a position to perform assigned tasks and to identify and avert potential hazards on their own.

User
The user is familiar with the basic regulations on occupational safety and accident prevention.

2.4 Personal protective equipment

Personal protective equipment is used to protect persons against adverse effects on their health and safety when working.

Personnel must wear personal protective equipment while carrying out the different tasks on and with the machine.

In the course of regular, recurring trainings, the owner should inform operating personnel that working without protective equipment can be detrimental to their health.

Protective equipment is selected according to the ambient conditions at the owner’s premises and the raw materials that are used. The information provided by the material manufacturer on the safety data sheet must be adhered to in order to ensure the proper selection of protective equipment.

The recommended personal protective equipment is described below:
Light respiratory protection

Light respiratory protection is used as protection against hazardous dusts.

Protective gloves

Protective gloves protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.

Safety goggles

Safety goggles are used to protect the eyes from airborne components and splashes of liquid.

Protective clothing

Protective clothing are tight fitting work clothes with low tear resistance, with tight sleeves, and without any protruding parts.
**Safety shoes**

Safety shoes protect the feet against crushing, falling parts or slipping on slippery ground.

**Safety helmet**

The helmet protects the head from falling parts and oscillating loads on the one hand, and it can protect it from injuries in cramped situations on the other.
3 Safety and responsibility

3.1 Responsibility of the owner

Owner

The owner is the person, who directly operates the machine for commercial or economical purposes or who allows a third-party to use/apply it and who is responsible for the legal product stewardship for the protection of the user, the personnel or third parties.

Owner responsibilities

The machine is used in an industrial environment. The owner of the machine is therefore subject to the obligations as stipulated by the Occupational Health and Safety Act.

In addition to the safety information in this manual, the country-specific safety, accident prevention guidelines and environmental protection regulations, applicable at the site of implementation of the machine must be adhered to.

Furthermore, the owner is responsible for making sure that the machine is always in perfect technical condition. Therefore, the following applies:

- The owner must ensure that the maintenance intervals described in this operating manual are adhered to.
- The owner must have all safety equipment checked regularly for functionality and completeness.

3.2 Intended use

The automatic spray gun is used to spray paints, dyes, adhesives, glazes, enamels, release agents, as well as other fluids. The nozzle size depends on the spray viscosity of the spray medium.

The intended use also includes the compliance with all the information in this operating manual.

3.3 Specification for the operation of a complete machine

- The operation without CE-marking is prohibited.
- Prior to its use, the automatic spray gun must be assembled to form a complete machine.
- Only operate the automatic spray gun after proper fastening on a suitable carrier construction.

3.4 Predictable misuse

Any use beyond the intended use or any other use constitutes misuse.

- Only carry out installation and commissioning in accordance with the steps described in this operating manual.
- Always observe the applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations etc. for the area of use for the automatic spray gun.
- Ensure that the utilised hose lines fulfil the requirements with respect to pressure, chemical, and mechanical loads.
- Do not use sharply abrasive, chemically aggressive, very hot or very cold spray media without first consulting with and receiving approval from Krautzberger GmbH.
- Adhere to the safety data sheets of the spray media manufacturer.
- Only use the manufacturer's OEM parts.
- Only operate the automatic spray gun after proper fastening on a suitable carrier construction.
- Do not hold the automatic spray gun in your hand during operation.
Only operate the automatic spray gun while adhering to the values specified in (Chapter 13 ‘Technical data’ on page 43).

Make sure that the connected compressed air is oil-free and free from solid matter.

Operate the automatic spray gun with processed, dried compressed air (air quality pursuant to DIN ISO 8573-1: quality class 4).

Never point the compressed air at living beings.

**WARNING!**
Misuse of the automatic spray gun can cause dangerous situations.

No claims of any kind can be asserted due to damage resulting from misuse!

### 3.5 General safety instructions

**WARNING!**
Life threatening risk of injury or property damage through the application of hazardous media!
The application of hazardous media can lead to death, serious injuries or property damage.

- Ensure the resistance of the machine against the medium that is to be applied.
- Always adhere to the safety data sheet of the medium that is to be applied.

**CAUTION!**
Risk of injury through compressed air!
Uncontrolled leaks of compressed air can lead to serious injuries!

- Prior to any work on the device, all compressed-air lines must be closed and bleed if necessary.

**WARNING!**
Sound pressure level
Depending on the operating conditions, the sound pressure of the device may cause hearing damage.

Take suitable action to reduce the impact of the existing sound pressure level. The owner is responsible for the type and implementation of suitable measures, which may depend on the local conditions.
Outdoor operation and operation in exterior areas!

Use suitable measures to protect the device during the operation from environmental impacts in an exterior area through:

– Moisture
– UV radiation
– Frost, etc.

3.6 Residual risks

The automatic spray gun made by Krautzberger GmbH has been manufactured based on state-of-the-art technology and generally accepted technical safety regulations.

Nonetheless, its use can pose a threat to the life or health of users or third parties, damage the automatic spray gun itself or cause other property damage.

- The automatic spray gun must only be used as intended.
- The automatic spray gun must only be operated in a defect-free condition.
- Any faults impacting the safety must be remedied immediately.

3.7 Course of action in an emergency

In principle, the applicable national, regional and internal company regulations concerning the course of action in case of an emergency must be adhered to and if necessary respective safety measures must be taken on the system owner's side.
4 Transport, storage, and packaging

4.1 Transport
- The automatic spray gun is protected by cardboard packaging.
- The cardboard packaging can be reused for storage.

4.2 Storage
Store the automatic spray gun under the following conditions:
- Store the automatic spray gun in the original packaging.
- Do not store outside.
- Store in a dry and dust-free environment.
- Keep away from any aggressive media.
- Protect from UV radiation.
- Avoid mechanical shocks.
- Storage temperature: 15 to 40 °C.
- Relative atmospheric humidity: max. 60%.

4.3 Packaging
The automatic spray gun is packaged in accordance with the anticipated transport conditions and the packaging needs to protect it against transport damage, corrosion, and other damage.
- Remove packaging material.
- Remove potentially present transport safety restraints.
5 Overview

Fig. 1: Overview

1 Air nozzle
2 Cap nut
3 Connection for material supply "M"
4 Cover clamp
5 Main element
6 Needle stroke adjustment screw
7 Connection for atomizer air "Z"
8 Connection for control air "St"
9 Installation screw
10 Installation drill hole
11 Head piece
6 Installation

6.1 Safety

Personnel:
- Specialised personnel

Protective equipment:

The selection of the protective equipment depends on the installation conditions on site. Always observe the applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations for the proper selection of the protective equipment.

⚠️ WARNING!

Danger of injury due to improper assembly!
Recoil forces and vibrations occur during the operation. In case of insufficient fastening, the automatic spray gun may come loose and cause serious injuries or property damage.

Note:
- Ensure sufficient fastening of the automatic spray gun.

⚠️ CAUTION!

Risk of injury due to sharp edges!
Sharp edges and pointed corners can cause abrasions and cuts on the skin.

Note:
- Proceed cautiously when working on or near sharp edges and pointed corners.
- Wear protective gloves, if in doubt.

6.2 General installation information

Adhere to the following general information for the installation:

- Only carry out installation and commissioning in accordance with the steps described in this operating manual.
- Ensure that the utilised hose lines fulfil the requirements with respect to pressure, chemical, and mechanical loads.
- Only operate the automatic spray gun after proper fastening on a suitable carrier construction.
- Make sure that the connected compressed air is oil-free and free from solid matter.
- Operate the automatic spray gun with processed, dried compressed air (air quality pursuant to DIN ISO 8573-1: quality class 4).
- Vibration and recoil forces may occur on the automatic spray gun during the operation. Ensure sufficient fastening.
- Never point the compressed air at living beings.
6.3 Installing the automatic spray gun

Changing the installation position of the automatic spray gun

The automatic spray gun can be mounted on both sides on the retaining bolts in order to change the installation position.

![Fig. 2: Installing the automatic spray gun](image)

1. Slide the automatic spray gun (Fig. 2/1) with the respectively designed drill hole over the retaining bolt (Fig. 2/2).
2. Fix retaining bolt with installation screw.
3. Ensure proper grounding of the automatic spray gun.

6.4 Connecting the automatic spray gun

See also (Chapter 6.5 ‘Connection scheme’ on page 19).

**WARNING!**

Danger of injury due to improper connection!

When the material supply is pressurised, e.g. from pressure containers or with pumps, the range of the fluid jet can increase by a multiple in case of atomizer air failure. This presents a hazard to people and property.

- Make sure that the material supply and the control air are interrupted if the atomizer air pressure drops off quickly.
- It is recommended to regulate the atomizer air pressure via a filter pressure reducer.
Fig. 3: Connecting the automatic spray gun

1. Connect the control air to input "St" (Fig. 3/3).
2. Connect the atomizer air to input "Z" (Fig. 3/2).
3. Connect the fluid line to (Fig. 3/1).

6.5 Connection scheme

Fig. 4: Connection scheme

Z  Atomisation air  DV  Pressure controller
St Control air  O/S (E)  3/2 control valve
<table>
<thead>
<tr>
<th>DE</th>
<th>Pressure generator</th>
<th>RW</th>
<th>Agitator unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Material</td>
<td>F</td>
<td>Filter</td>
</tr>
<tr>
<td>RR</td>
<td>Back pressure regulators</td>
<td>H</td>
<td>Ball cock</td>
</tr>
</tbody>
</table>
7 Operation
7.1 Safety

Personnel:
- User
- Specialised personnel

Protective equipment:

The selection of the protective equipment depends on the medium used by the owner. The information provided by the medium manufacturer indicated on the safety data sheet must be adhered to in order to ensure the proper selection of protective equipment.

**WARNING!**

Risk of injury due to improper operation!
Improper operation can lead to serious personal injuries or property damage.

Note:
- Never point compressed air at people.
- Check the material and compressed air hose lines before each use for damage and tight fit.
- Adhere to the spray media manufacturer’s specifications in the safety data sheet.
- Make sure that the connected compressed air is oil-free and free of solid matter.

**WARNING!**

Life threatening risk of injury or property damage through the application of hazardous media!
The application of hazardous media can lead to death, severe injuries or property damage.

Note:
- Ensure the resistance of the device/machine against the medium that is to be applied.
- Always adhere to the safety data sheet of the medium that is to be applied.
  The owner is responsible for the presence and the up-to-date status of the safety data sheet and the associated generation of the risk assessment of the effected workstations.
CAUTION!
Risk of injury from compressed air!
Uncontrolled leaks of compressed air can lead to serious injuries!
Therefore:
- Check the compressed air hose lines for damage and tight fit before commissioning.
- Check the compressed air hose lines for proper connection before commissioning.
- Never point compressed air at living beings.

7.2 General information about commissioning and start-up
Adhere to the following general information for commissioning:
- Only carry out the commissioning of the automatic spray gun pursuant to the steps described in this operating manual.
- Check the material and compressed air hose lines for damage and tight fit before each use.
- Always observe the applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations etc. for the area of use for the automatic spray gun.
- Do not use sharply abrasive, chemically aggressive, very hot or very cold spray media without first consulting with and receiving approval from Krautzberger GmbH.
- Adhere to the spray media manufacturer's safety data sheets.
- Only operate the automatic spray gun while adhering to the values specified in (Chapter 13 'Technical data' on page 43).
- Only operate the automatic spray gun after proper fastening on a suitable carrier construction.
- Do not hold the automatic spray gun in your hand during operation.
- Never point the compressed air at living beings.
- Adhere to the operating manuals for the respective components.

7.3 Operation

To achieve optimal results, adhere to the following:
- Rinse the automatic spray gun with cleaning products before commissioning.
- Too-high air pressure causes unnecessarily high air consumption and too-strong atomization of the spray medium.
- Too-low air pressure produces an unsatisfactory spray pattern.
- Select the lowest possible material pressure.
WARNING!

Sound pressure level
Depending on the operating conditions, the sound pressure of the device may cause hearing damage.
Take suitable action to reduce the impact of the existing sound pressure level. The owner is responsible for the type and implementation of suitable measures, which may depend on the local conditions.

CAUTION!

Risk of injury from compressed air!
Uncontrolled leaks of compressed air can lead to serious injuries!
Therefore:
– Check the compressed air hose lines for damage and tight fit before commissioning.
– Check the compressed air hose lines for proper connection before commissioning.
– Never point compressed air at living beings.

1. Switch on the compressed air supply.
2. Where applicable, switch on pump or pressurised container for spray medium.
3. Point the automatic spray gun at a test surface.
4. Begin the spray process by switching on the control air.
5. Adjust the spray pattern (§ Chapter 7.4 ‘Adjusting the spray pattern’ on page 23).
6. End the spray process by switching off the control air.
7. Direct the automatic spray gun towards the work piece.
8. Begin the spray process by switching on the control air.

7.4 Adjusting the spray pattern
Air and fluid nozzles are available in various sizes. There are 4 different families:

- **Round jet** – cone-shaped jet in front of the nozzle.
- **Flat jet** – width-adjustable jet for flat-shaped application.
- **Rotary stream** – a rotary pulse produces a highly “swirled” spray jet; for difficult workpiece geometries (angular sections etc.).
- **Full-cone rotary stream** – a rotary pulse produces a highly “swirled” spray jet; for difficult workpiece geometries (back cuts, etc.).

Adjust the spray pattern with the following measures:

- Change the atomiser air pressure.
- Change the pressure of the spray fluid.
Select another nozzle size.

Needle stroke (Chapter 7.5 ‘Adjusting the needle stroke’ on page 24).

Too-high air pressure causes unnecessarily high air consumption and too-strong atomisation of the spray fluid. It is recommended that you first adjust the spray pattern by varying the air and spray fluid pressure. If you cannot achieve satisfactory results this way, you should experiment with other nozzle sizes.

7.5 Adjusting the needle stroke

Fig. 5: Adjusting the needle stroke

Adjust the needle stroke by turning the needle stroke adjustment screw (Fig. 5/1).

7.6 Shutting down

7.6.1 Temporary shut-down

End the spray process by switching off the control air.

7.6.2 Long-term shut-down

1. End the spray process by switching off the control air.

2. Close the material supply and switch off the material pressure pump or the pressure container if necessary.

3. If necessary, clean the automatic spray gun (Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26).
8 Maintenance

8.1 Safety

Personnel:
- Specialised personnel

Protective equipment:

The selection of the protective equipment depends on the maintenance conditions on site and the medium utilized by the system owner. The applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations must observed for the proper selection of the protective equipment and the information given by the spray medium manufacturer on the safety data sheet must be taken into consideration.

**WARNING!**

Risk of injury through the use of incorrect spare parts!

The use of incorrect or defective spare parts can cause hazards for the personnel as well as damage, malfunctions or complete failure.

- Only use OEM parts from Krautzberger or Krautzberger-approved spare parts.
- In case of questions, always contact our Customer Care department.

**CAUTION!**

Risk of injury through compressed air!

Uncontrolled leaks of compressed air can lead to serious injuries!

- Prior to any work on the device, all compressed-air lines must be closed and bleed if necessary.

**Hose and pipelines**

*Even with intended use by environmental influences, the service life of hose lines and pipelines is limited. For the sake of prevention, all hose and pipelines should be replaced regularly according to their load.*

8.2 Maintenance schedule

The following sections describe the maintenance work that is required for optimal and fault-free operation of the automatic spray gun. Check wearing parts such as seals, nozzles and needles at regular intervals. The level of wear depends on the abrasiveness of the spray medium used. Escaping air and spray medium as well as the deterioration of the spray pattern are signs that parts are worn. Contact Krautzberger Customer Care should you have any questions about maintenance work and maintenance intervals.
Interval | Maintenance work | Personnel
---|---|---
before performing any maintenance work | Clean the automatic spray gun (Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26) | Qualified personnel
If needed | Change the material nozzle and air nozzle (Chapter 8.4 ‘Changing the fluid nozzle and the air nozzle’ on page 28) |  
 | Change the material needle (Chapter 8.5 ‘Changing the material needle’ on page 29) |  
 | Change the needle seals (Chapter 8.6 ‘Changing the needle seals’ on page 33) |  

### 8.3 Cleaning the automatic spray gun

**WARNING!**

**Risk of injury due to improper cleaning!**

- Adhere to the safety data sheets of the cleaning agent manufacturer.
- Do not fully immerse the automatic spray gun in cleaning agent.
1. Suspend operation (\textit{\textcopyright{} Chapter 7.6 ‘Shutting down’ on page 24}).

2. Switch off the system and secure it against a restart.

3. Connect the cleaning agent to material supply connection "M".

4. Switch on the compressed air supply.

5. Where applicable, switch on the material pressure pump or pressure container for cleaning agent.

6. \textbf{WARNING!}

    \textbf{Sound pressure level}

    Depending on the operating conditions, the sound pressure of the automatic spray gun may cause hearing damage.

    Begin the spray process by switching on the control air (connection "ST").

7. Spray until the cleaning agent runs clear.

8. Interrupt the supply of cleaning agent by switching off the material pressure pump or the pressure container.

9. Blow out the cleaning agent residue by briefly switching on the control air.

10. Switch off the compressed air supply and secure it against a restart.

11. Clean the outside of the automatic spray gun with a cloth dipped in cleaning agent.

12. Remove material and air nozzle (\textit{\textcopyright{} Chapter 8.4 ‘Changing the fluid nozzle and the air nozzle’ on page 28}) and clean with a soft brush. Do not use hard or sharp-edged objects. We recommend our brush set. See the last page for contact information.

13. Slightly grease the sliding parts with special Krautzberger grease.

\textit{The special grease can be purchased from Krautzberger GmbH (contact data see last page).}
8.4 Changing the fluid nozzle and the air nozzle

Removing the nozzles

1. Clean automatic spray gun (☞ Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26).

![Diagram of nozzle removal process]

2. Loosen cap nut (Fig. 6/3).
3. Remove air nozzle (Fig. 6/2).
4. Unscrew fluid nozzle (Fig. 6/1) with a fork wrench.

![Information icon]

*Always replace the fluid nozzle and fluid needle at the same time (☞ Chapter 8.5 ‘Changing the material needle’ on page 29).*

Attaching the nozzles

1. Tighten the fluid nozzle (Fig. 6/1) with a fork wrench.
2. Attach the air nozzle (Fig. 6/2) and tighten it with the cap nut (Fig. 6/3).
8.5 Changing the material needle

1. Clean the automatic spray gun (Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26).

2. Loosen the locking piece (Fig. 7/8) and unscrew it from the main element (Fig. 7/1).

   **WARNING!**
   The locking piece (Fig. 7/8) is under spring tension.

3. Remove the pressure spring (Fig. 7/7).

4. Remove the valve shaft (Fig. 7/3) with material needle (Fig. 7/4) and check the condition of the O-ring (Fig. 7/9); replace it if necessary.

5. Unscrew the screw plug (Fig. 7/6).

6. Remove the pressure spring (Fig. 7/5).

7. **CAUTION!**
   Risk of injury due to material needles!

   Remove the material needle (Fig. 7/4).

8. **WARNING!**
   Risk of injury through the use of incorrect spare parts!
Remove the O-ring (Fig. 7/2) in the ring nut and the sleeve (Fig. 7/10) and check the condition; replace them if necessary.
Installing the material needle

**Fig. 8: Installing the material needle**

1. If necessary, screw the needle nuts (Fig. 8/2) onto the material needle (Fig. 8/1).

**Fig. 9: Installing the material needle**

2. If necessary, adjust the needle setting dimension to 81.5 mm (72.5 mm if using a round jet nozzle) and tighten or the counter the needle nuts (Fig. 9/1).

**Fig. 10: Installing the material needle**

3. Insert the sleeve (Fig. 10/10) in the main element.

4. Tighten the ring nut (Fig. 10/2) using the special tool.

*The special tool can be purchased via Krautzberger GmbH. See the last page for contact information.*
5. **CAUTION!**
Risk of injury due to material needles!

Insert the material needle (Fig. 10/4) into the valve shaft (Fig. 10/3).

6. Insert the pressure spring (Fig. 10/5).

7. Tighten the screw plug (Fig. 10/6) and seal with Loctite 222.

8. Insert the valve shaft (Fig. 10/3) and material needle (Fig. 10/4) with O-ring (Fig. 10/9) into the control unit (Fig. 10/1).

9. Insert the pressure spring (Fig. 10/7) and tighten the locking piece (Fig. 10/8).

10. After assembly, check all parts for tight fit.

11. Check moving parts for free range of motion.
8.6 Changing the needle seals
Removing the needle seals

1. Clean automatic spray gun (Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26).

2. Remove cover clamp (Fig. 11/1).

3. Loosen cylinder screws (Fig. 11/4) and remove head piece (Fig. 11/3) from main element (Fig. 11/2).

4. Unscrew needle guide (Fig. 12/3) from the head piece (Fig. 12/4).

5. Pull out slotted ring (Fig. 12/2) and flat seal (Fig. 12/1).
Use a bent wire to dismantle the slotted ring or the flat seal.

6. Remove the fluid needle (☞ Chapter 8.5 ‘Changing the material needle’ on page 29).

Fig. 13: Needle seals

7. Unscrew seal screw (Fig. 13/1) from main element (/5).

8. Pull out the flat seals (Fig. 13/2, 3, and 4).

Fig. 14: Needle seals

Use a bent wire to dismantle the flat seals.

Installation
1. **WARNING!**

Risk of injury through the use of incorrect spare parts!

Push flat seals (Fig. 14/2, 3, and 4) into seal screw.

- Slightly grease new seals with special Krautzberger grease.

- The special grease can be purchased from Krautzberger GmbH (contact data see last page).

2. Screw seal screw (Fig. 14/1) into main element (Fig. 14/5) by hand.

3. Carefully tighten seal screw (Fig. 14/1).

- **NOTICE!**

Tighten seal screw not too tightly; fluid needle can jam and the seals may get damaged.

4. Insert slotted ring (Fig. 15/2) and flat seal (Fig. 15/1).

5. Tighten needle guide (Fig. 15/3).

---

**Fig. 15: Needle seals**
6. Carefully put together head piece (Fig. 16/3) and main element (Fig. 16/2) and tighten cylinder screws (Fig. 16/4).

7. Place cover clamp (Fig. 16/1).
## 9 Faults

**Personnel:**
- Qualified personnel

*If the fault is not listed in the following tables or if it cannot be eliminated with the measures described, contact Krautzberger Customer Care.*

### Troubleshooting table

<table>
<thead>
<tr>
<th>Spray pattern</th>
<th>Error</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Normal flat jet spray pattern" /></td>
<td>Normal flat jet spray pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Spray pattern too heavy towards the top and towards the bottom" /></td>
<td>Spray pattern too heavy towards the top and towards the bottom</td>
<td>Dirty air nozzle; Dirty fluid nozzle</td>
<td>Clean nozzles (☞ Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26)</td>
</tr>
<tr>
<td><img src="image" alt="Spray pattern concentrated on the left or right side" /></td>
<td>Spray pattern concentrated on the left or right side</td>
<td>Dirty air nozzle; Dirty fluid nozzle</td>
<td>Clean nozzles (☞ Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26)</td>
</tr>
<tr>
<td><img src="image" alt="Heavy application in the centre of the spray pattern" /></td>
<td>Heavy application in the centre of the spray pattern</td>
<td>Too much material</td>
<td>Reduce material supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material too thick</td>
<td>Thin material</td>
</tr>
<tr>
<td><img src="image" alt="Split spray pattern" /></td>
<td>Split spray pattern</td>
<td>Insufficient material</td>
<td>Increase material supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flat jet air pressure too high</td>
<td>Reduce flat jet air pressure</td>
</tr>
<tr>
<td>Spray pattern</td>
<td>Error</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>![ Spray pattern too thin ]</td>
<td>Spray pattern too thin</td>
<td>Cap nut loose</td>
<td>Tighten cap nut</td>
</tr>
<tr>
<td>![ Fluid jet comes out in spurts or rapid bursts ]</td>
<td>Fluid jet comes out in spurts or rapid bursts</td>
<td>Insufficient material supply</td>
<td>Increase material supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blocked fluid path</td>
<td>Clean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose or damaged fluid nozzle</td>
<td>Tighten or replace (<a href="#">Chapter 8.4 ‘Changing the fluid nozzle and the air nozzle’ on page 28</a>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worn needle seal</td>
<td>Replace needle seal (<a href="#">Chapter 8.6 ‘Changing the needle seals’ on page 33</a>)</td>
</tr>
<tr>
<td>![ Leakage on the clamping screw ]</td>
<td>Leakage on the clamping screw</td>
<td>Needle seal defective</td>
<td>Replace needle seal (<a href="#">Chapter 8.6 ‘Changing the needle seals’ on page 33</a>)</td>
</tr>
<tr>
<td>![ Fluid nozzle drips ]</td>
<td>Fluid nozzle drips</td>
<td>Worn or damaged fluid needle</td>
<td>Change fluid needle (<a href="#">Chapter 8.5 ‘Changing the material needle’ on page 29</a>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dirty or damaged fluid nozzle</td>
<td>Clean (<a href="#">Chapter 8.3 ‘Cleaning the automatic spray gun’ on page 26</a>) or replace fluid nozzle (<a href="#">Chapter 8.4 ‘Changing the fluid nozzle and the air nozzle’ on page 28</a>)</td>
</tr>
</tbody>
</table>
9.1 Customer Care

Krautzberger GmbH
Customer service
Stockbornstr. 13
65343 Eltville am Rhein
+49 6123 698151
customercare@krautzberger.com
10 Spare parts

- Only use OEM parts from Krautzberger or Krautzberger-approved spare parts.
- In case of questions, always contact our Customer Care department.

Spare parts order – General

To make spare part ordering easier, please provide the following information:

- Serial number
- Model / product name
- Designation
- Item number according to spare parts list
- Quantity
- Desired shipping method (post, freight, sea, air, express)
- Delivery address

A complete spare part overview is available on the website of Krautzberger GmbH:
www.krautzberger.de
11 Accessories

A wide range of accessories is available for the automatic spray gun. For further information, visit us on the Internet (www.krautzberger.com) or contact your Krautzberger specialist dealer, consultant or our office staff. Here are a few examples:

- Air nozzles
- Fluid needles
- Fluid nozzles
- Arm extension for robot
- etc.
12 Disassembly and disposal

12.1 Safety

Personnel:
- Specialised personnel

Protective equipment:

The selection of the protective equipment depends on the installation conditions on site and the medium used by the owner. The applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations must be adhered to for the proper selection of the protective equipment and the information given by the spray medium manufacturer on the safety data sheet must be taken into consideration.

12.2 Disassembly

**WARNING!**
Risk of injury due to improper disassembly!

Prior to starting the disassembly:
- Switch off the device and secure it against a restart.
- Physically disconnect the entire power supply from the device, and discharge any energy stored in the machine.
- Remove and dispose of operating and auxiliary material as well as remaining processing materials in an environmentally friendly manner.

Afterwards, properly clean components and modules and take them apart in compliance with applicable local occupational health & safety regulations as well as environmental protection regulations.

12.3 Disposal

**ENVIRONMENT!**

Danger to the environment due to incorrect disposal!
Incorrect disposal may cause dangers to the environment.

If no return or disposal agreement has been made, recycle the dismantled parts:
- Scrap metals.
- Recycle plastic components.
- Sort remaining components based on the respective material and dispose of them accordingly.
- Properly dispose of potential spray media residue separately from the device.

If in doubt, obtain information about environmentally-appropriate disposal from the local authorities or specialised disposal companies.
13 Technical data

13.1 Dimensions and weight

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>max. 27</td>
<td>mm</td>
</tr>
<tr>
<td>Height</td>
<td>max. 33.5</td>
<td>mm</td>
</tr>
<tr>
<td>Length</td>
<td>123.7</td>
<td>mm</td>
</tr>
<tr>
<td>Connection for spray medium</td>
<td>G1/8</td>
<td>&quot;</td>
</tr>
<tr>
<td>Connection for atomiser air (recommended inner-Ø for 4 m line length)</td>
<td>3/5 (plastic hose)</td>
<td>mm</td>
</tr>
<tr>
<td>Connection for control air (recommended inner-Ø for 4 m line length)</td>
<td>3/5 (plastic hose)</td>
<td>mm</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 320</td>
<td>g</td>
</tr>
</tbody>
</table>

13.2 General specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working pressure control air</td>
<td>6</td>
<td>bar</td>
</tr>
<tr>
<td>Working pressure spray medium</td>
<td>max. 6</td>
<td>bar</td>
</tr>
<tr>
<td>Working pressure, atomiser air</td>
<td>max. 6</td>
<td>bar</td>
</tr>
<tr>
<td>Sound pressure level depends on the nozzle</td>
<td>approx. 73 - 96</td>
<td>dB(A)</td>
</tr>
<tr>
<td>Spray medium temperature</td>
<td>max. +70</td>
<td>°C</td>
</tr>
<tr>
<td>Control and atomisation temperature</td>
<td>max. +50</td>
<td>°C</td>
</tr>
</tbody>
</table>
13.3 Dimensions

Fig. 17: Dimensions
14 Declaration of incorporation

EC-installation explanation by machine guideline in 2006 / 42 / the EC appendix II 1st B

The manufacturer
Krautzberger GmbH
Stockbornstr. 13
65343 Eltville
Deutschland

hereby declares, that the following product

Product / Project name: Automatic spray gun Mikro 3
Article number: 200-0190, 200-0154, 200-0152

...to the following basic requirements of the guideline corresponds:

see appendix "list of the kept requirements after appendix I of the EC-machine guideline in 2006 / 42 / the EC".

The commissioning of this product is prohibited so long, until the machine or the layout in which this product should be installed or from which shows it a component, corresponds to the regulations of all relevant guidelines.

Followers harmonised norms were applied:

EN ISO 14121-1:2007

The following national or international norms (or parts / clauses from it) and specifications were applied:

EN 13966-1

For the product the special technical bases were constructed according to appendix VII shares B, at reasonable desire these bases of a state place can be transmitted by post, e-mail, messenger.

Name and address of the person who is authorised to put together the technical documents

Andreas Lotz
o/c Krautzberger GmbH
Stockbornstr. 13
65343 Eltville
Deutschland

Place: Eltville am Rhein
Date: 08.01.2016

Jörg Blumrich( Head of Design/Development )
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