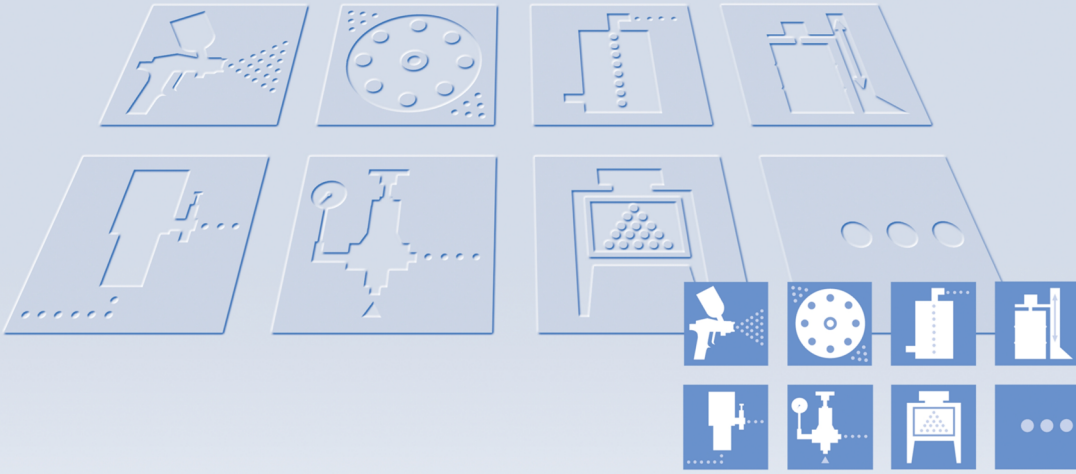
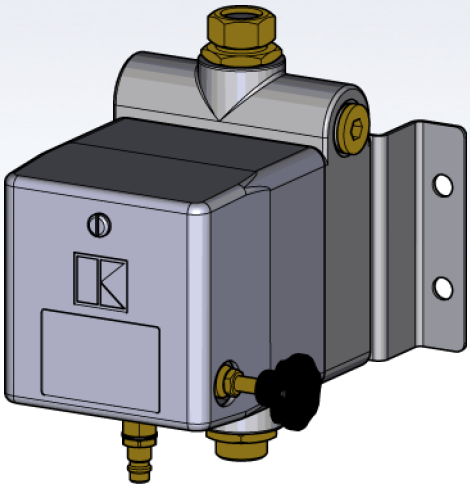




GB

Operating instructions
Diaphragm pump MP-100

T-Dok-237-GB-Rev.2

■ **Article No. 200-0104**

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.

Table of contents

1 Function and identification

1.1 Function

The diaphragm pump is an air-operated diaphragm pump.

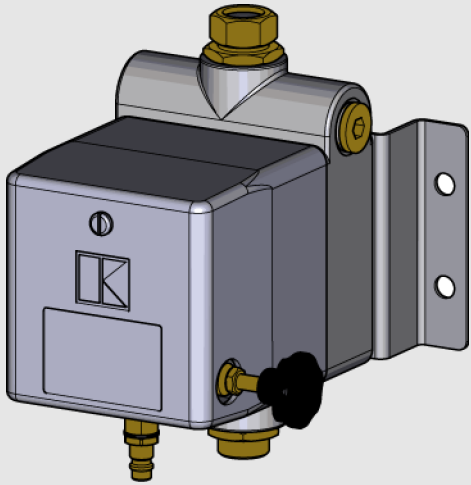
By changing the pressure in the air supply, the conveying capacity of the diaphragm pump can be seamlessly regulated.

As soon as the set fluid pressure has been reached, the diaphragm pump switches off automatically. The fluid pressure is maintained until material is extracted at the extraction point. The diaphragm pump switches on automatically and keeps the set fluid pressure constant.

It is optimally suited for conveying paints, oils, etc.

1.2 Identification

Model	Max. pressure	Delivery rate (with reference to water, free flow)	Weight	Product number
MP-100	6.5 bar / 94.3 psi	10 l/min	5.0 kg	200-0104

Scope of delivery	Model	Product number
	Diaphragm pump MP-100	200-0104
	Operating instructions	T-Dok-237

Serial number

A type plate is fitted to the diaphragm pump for clear identification.

Fig. 1: Type plate

2 Safety and responsibility

2.1 Symbols in this manual

Safety instructions

This 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 possibly dangerous situation which can cause death or severe injuries if it is not averted.

CAUTION!

This combination of symbol and signal word indicates a possibly dangerous situation which can cause slight injuries if it is not averted.

NOTICE!

This combination of symbol and signal word indicates a possibly dangerous situation which can cause property and environmental damage if it is not averted.

ENVIRONMENT!

This combination of symbol and signal word indicates potential dangers to the environment.

Tips and recommendations

This symbol highlights useful tips and recommendations as well as information for efficient and trouble-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 during the execution of the action. The signal words described above are used.

1. Unfasten screw.
2. **CAUTION!**

   Pinching hazard at the cover!

   Carefully close cover.
3. Tighten screw.

Special safety instructions

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

Warning signs	Type of danger
	Warning – hot surface.
	Warning – danger zone.

Additional identifications

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

Identification	Explanation
→	Step-by-step instructions
⇨	Results of procedural steps
🕮	References to sections in this manual and other applicable documents
■	Lists without specified order
[Pushbuttons]	Operating elements (e.g. pushbuttons, switches), display elements (e.g. signal lights)
'Display'	Screen elements (e.g. pushbuttons, assignment of function keys)

2.2 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.

Trained electrician
Due to specialised professional training, knowledge and experience as well as knowledge of the industry specific standards and regulations, a trained electrician is able to carry out work on the electrical systems and to identified and avert potential risks on his/her own.

The trained electrician has completed specialised training for the specific work environment where he/she works and knows the relevant standards and regulations.

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

2.3 Personal protective equipment

Personal protective equipment is used to protect persons from impacts on their occupational health and safety.

The personnel must wear personal protective equipment while carrying out the different tasks and while working with the device.

The selection of the protective equipment depends on the coating material that is used. To ensure the proper selection of personal protective equipment, the information provided by the spray material manufacturer indicated on the safety data sheet must be adhered to.

Description of the personal safety equipment recommended by Krautzberger

The personal safety equipment and clothing is described below:

Protective equipment:

- Protective clothing
- Ear protection
- Light respiratory protection
- Safety goggles
- Protective gloves
- Safety shoes
- Safety helmet

2.4 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.

2.5 Intended use

The MP-100 diaphragm pump is a pump operated with compressed air and is used exclusively:

- for the conveying of liquid and low-viscosity coatings from non-pressurised storage containers.
- for the supply of material to spray guns. automatic spray guns, metering devices and similar.

It is mainly used for painting and coating procedures.

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

2.6 Predictable misuse

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

- Only carry out the installation and start-up in accordance with the steps described in these operating instructions.
- Always observe the applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations for the area of use for the diaphragm pump.

- Ensure that the utilised hose lines fulfil the requirements with respect to pressure, chemical, and mechanical loads.
- The chemical resistance of the materials which we use cannot always be assessed with authority due to the large number of fluids, concentrations, temperatures and impurities used. For this reason, please test the suitability because we cannot extend any respective guarantees.
- Adhere to the safety data sheets of the spray medium manufacturer.
- Only use the manufacturer's OEM parts.
- Only operate the diaphragm pump after fastening it properly to a suitable supporting structure.
- Only operate the diaphragm pump in compliance with the values specified in (*Chapter 12 'Technical data' on page 41*).
- Make sure that the connected compressed air is oil-free and free from solid matter.
- Operate the diaphragm pump with processed, dried compressed air (air quality pursuant to DIN ISO 8573-1: quality class 4).
- Never point the compressed air at living beings.
- The conformity of the product is voided in case of structural modifications of the diaphragm pump.
- Do not use the diaphragm pump in the food or pharmaceutical sectors.

WARNING!

Improper of the diaphragm pump can lead to hazardous situations.

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

2.7 General safety instructions

WARNING!

Risk of death, risk of injury or property damage due to hazardous media!

Potential consequences: The application of hazardous media can lead to death, severe injuries or property damage.

When handling hazardous substances, ensure that the current safety data sheets of the hazardous substance manufacturer are available. The necessary measures can be derived from the content of the safety data sheet. Since the hazardous potential of a material can be reassessed at any time due to lessons learned, the safety data sheet must be checked regularly and replaced if necessary.

The system 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.

WARNING!

Hazardous media / contamination of persons and equipment

Possible consequences: Fatality or serious injuries, property damage

– Ensure the resistance of the device against the medium that is to be conveyed
– Always adhere to the safety data sheet of the medium that is to be conveyed The system owner is responsible that the safety data sheet is present and up-to-date
– The safety data sheet of the conveyed medium is always authoritative for the initiation of countermeasures in case of a leak of the conveyed medium
– Adhere to the general limitations with respect to viscosity limits, chemical stability and density

WARNING!

Operating life of the diaphragm

Possible consequences: Fatality or serious injuries

Operating life of the diaphragm cannot be exactly indicated. The possibility of breakage and subsequent discharge of fluid must therefore be anticipated.

In addition, you must prevent that particles of the defective diaphragm enter the conveyed medium. This can be achieved for example through filtration, hose breakage alarms, and other measures suitable for the respective process.

WARNING!

Risk of injury due to hot surfaces!

The surfaces of components can become very hot during operation. Direct contact with hot surfaces causes severe skin burns.

– Do no touch hot surfaces during operation, wear protective gloves if necessary.
– Ensure that all surfaces have sufficiently cooled down prior to starting any work.

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 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.

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.*

2.8 Residual risks

Devices, machines or systems made by Krautzberger GmbH have been manufactured based on state-of-the-art technology and in compliance with technical safety regulations.

Nonetheless, their use may pose a threat to the life or health of users or third parties, or harm the device, the machine, the system or other material assets.

- Mechanical hazards (crushing, shearing, cutting, jamming, burning, etc.) are possible at any time during the installation, during operation as well as during maintenance work and servicing.

2.9 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.

3 Transport and storage

3.1 Transport

- The diaphragm pump is protected by cardboard packaging.
- The cardboard packaging can be reused for storage.

3.2 Storage

Store packaged units subject to following conditions:

- 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%.

3.3 Packaging

The diaphragm pump 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.

4 Menu

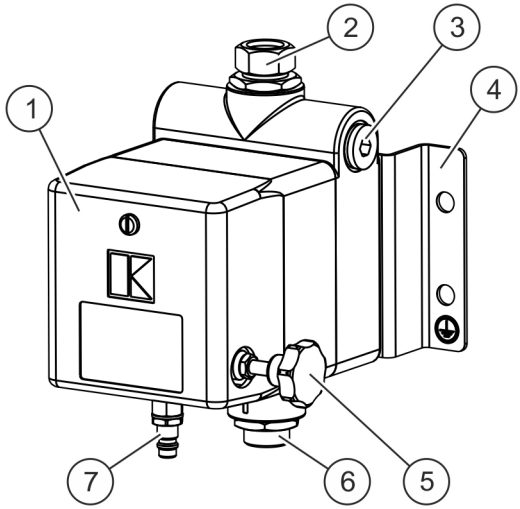


Fig. 2: Menu

1 Cover hood
2 Surge tank connection
3 Material pressure connection
4 Mounting bracket
5 Compressed air controller
6 Material intake connection
7 Compressed-air connection

5 Installation

5.1 Safety

Personnel:

- Specialised personnel
- Trained electrician

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!

Risk of injury due to improper installation!

Improper installation may cause serious personal injury or material damage.

Note:

– Ensure ample of space for the installation prior to starting any work.
– Carefully handle open, sharp-edged components.
– Maintain order and cleanliness at the installation site. Components that are loosely stacked or are scattered around can cause accidents.
– Assemble components properly. Adhere to specified screw tightening torque.
– Secure components against tipping or falling.
– Ensure that the utilised hose lines meet the requirements for pressure, chemical and mechanical loads. At the same time, adhere to the spray media manufacturer's specifications in the safety data sheet.

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.

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.

5.2 General installation information

Adhere to the following general information for the installation:

- Only carry out the installation and start-up in accordance with the steps described in these operating instructions.
- Ensure that the utilised hose lines meet the requirements for pressure, chemical and mechanical loads.
- Only operate the diaphragm pump after fastening it properly to a suitable wall or supporting structure.
- Install the diaphragm pump vertically and with the fluid intake connection pointing down.
- 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 forces may occur on the diaphragm pump during operation. Ensure sufficient fastening.
- Never point the compressed air at living beings.

5.3 Installing the diaphragm pump

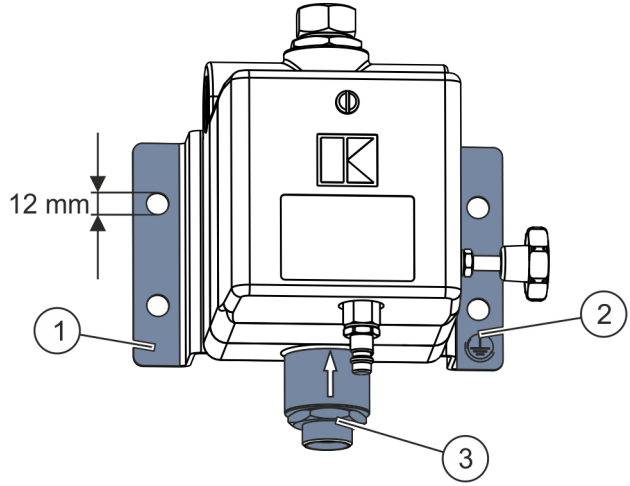


Fig. 3: Installation

Mount the diaphragm pump vertically with the fixing brackets (Fig. 3/1 and 2) using suitable fastening screws and with the fluid intake connection (Fig. 3/3) facing downward, on a wall or supporting structure.

Screw onto the grounding with the fixing bracket (Fig. 3/2).

WARNING!

Risk of fatal injury from electrostatic charge!

Electrostatic charges can cause shocks and sparks and thus lead to explosions.

– Properly ground the diaphragm pump.

5.4 Connection example

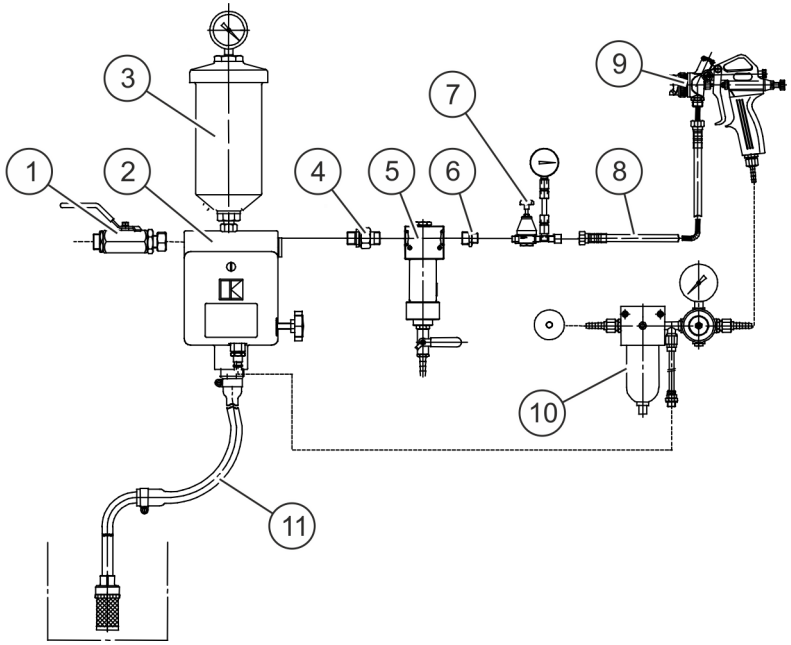


Fig. 4: Connection example

1 Ball cock
2 Diaphragm pump MP-100
3 Surge tank
4 Screw connection
5 Material filter
6 Reducer
7 Material controller
8 Low-pressure fluid hose with fittings
9 Spray gun
10 Air controller unit with filter
11 Intake hose with suction cage

5.5 Connecting the diaphragm pump

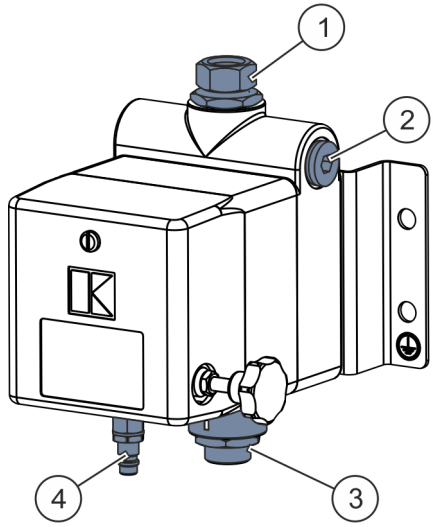


Fig. 5: Connection

1. Connect the intake hose to the fluid intake connection (Fig. 5/3).

2. Connect the fluid pressure hose to the fluid pressure connection (Fig. 5/2).

The fluid pressure connection can be made on the left or right. Screw the sealing screw (Fig. 5/2) into the unused connection and tighten it.

3. If necessary, connect the surge tank to the connection (Fig. 5/1).

4. Connect the compressed-air supply to the compressed-air connection point (Fig. 5/4).

The compressed air supply must be dry, free of oil and secured by a pressure relief valve.

There must be a suitable shut-off device (e.g. Chapter 5.4 ‘Connection example’ on page 20/1) installed in order to be able to switch the diaphragm pump off quickly in case of a breakdown.

5. Check all connections for a tight fit.

6 Operation

6.1 Safety

Personnel:

- User
- Specialised personnel

Protective equipment:

The selection of the personal protective equipment depends on the utilised medium of the system 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 personal 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!

Risk of death, risk of injury or property damage due to hazardous media!

Potential consequences: The application of hazardous media can lead to death, severe injuries or property damage.

When handling hazardous substances, ensure that the current safety data sheets of the hazardous substance manufacturer are available. The necessary measures can be derived from the content of the safety data sheet. Since the hazardous potential of a material can be reassessed at any time due to lessons learned, the safety data sheet must be checked regularly and replaced if necessary.

The system 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.

WARNING!

Hazardous media / contamination of persons and equipment

Possible consequences: Fatality or serious injuries, property damage

– Ensure the resistance of the device against the medium that is to be conveyed
– Always adhere to the safety data sheet of the medium that is to be conveyed The system owner is responsible that the safety data sheet is present and up-to-date
– The safety data sheet of the conveyed medium is always authoritative for the initiation of countermeasures in case of a leak of the conveyed medium
– Adhere to the general limitations with respect to viscosity limits, chemical stability and density

WARNING!

Risk of fatal injury, risk of injury or property damage due to damaged or disconnected lines!

Damaged or disconnected lines can cause death, serious injuries or property damage due to whip-like movements and the spraying of fluids.

Note:

– Check the fluid and compressed air lines for damage and a tight fit prior to every work process.

WARNING!

Risk of injury due to hot surfaces!

The surfaces of components can become very hot during operation. Direct contact with hot surfaces causes severe skin burns.

– Do no touch hot surfaces during operation, wear protective gloves if necessary.
– Ensure that all surfaces have sufficiently cooled down prior to starting any work.

WARNING!

Hearing damage due to excessive noise exposure!

Depending on the operating conditions, the sound pressure of the device/machine may cause hearing damage.

Note:

– 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.

6.2 General information about the start-up

Adhere to the following general information for the start-up:

- Carry out the start-up of the diaphragm pump only in compliance to the steps described in these operating instructions.
- 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 for the area of use for the diaphragm pump.
- The chemical resistance of the materials which we use cannot always be assessed with authority due to the large number of fluids, concentrations, temperatures and impurities used. For this reason, please test the suitability because we cannot extend any respective guarantees.
- Adhere to the spray media manufacturer's safety data sheets.
- Only operate the diaphragm pump in compliance with the values specified in (*Chapter 12 'Technical data' on page 41*).
- Only operate the diaphragm pump after fastening it properly to a suitable wall or supporting structure.
- Never point the compressed air at living beings.
- Adhere to the operating instructions for the respective components.

6.3 Shutting down

6.3.1 Temporary shut-down

Interrupt the compressed air supply in a suitable location (e.g. shut-off device).

6.3.2 Long-term shut-down

1. Interrupt the compressed air supply in a suitable location (e.g. shut-off device).
2. Clean diaphragm pump (*Chapter 7.4 'Clean the diaphragm pump' on page 28*).
3. Interrupt the compressed air supply at a suitable location (e.g. shut-off device) and secure it against a restart.

6.4 Start-up

1. Check the material and compressed air lines to make sure they are undamaged and have a secure fit.
2. Switch on the compressed air supply.
3. Make sure that there is air pressure of 4 to 8 bar.
4. Make sure that the fluid intake hose is dipped into the material.

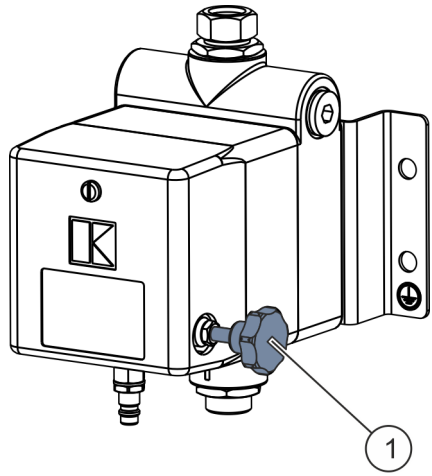


Fig. 6: Compressed air controller

5. To bleed the pressure controller (Fig. 6/1), first set a low air pressure.

> **NOTICE!**
>
> **Risk of increased wear in idle mode!**
>
> During initial commissioning there is still air in the diaphragm pump and the supply lines. In idle mode the diaphragm pump is subject to particularly high levels of wear.

6. Activate the extraction point (e.g. manual spray gun) until material escapes.
7. After successful bleeding, set the desired fluid pressure with the pressure controller.

7 Maintenance

7.1 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 operating company. The applicable country-specific safety, accident prevention, occupational safety, and environmental protection regulations must adhered to for the proper selection of the protective equipment and the information given by the spray media 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 risks for the personnel as well as damage, malfunctions or complete failure.

– Only use original spare parts from Krautzberger or spare parts that have been approved by Krautzberger.
– In case of questions, always contact our service department.

WARNING!

Risk of injury through a pressurized diaphragm pump!

Uncontrollably leaking pressurized fluids or compressed air can cause serious injuries.

Note:

– Prior to any work on the device, all compressed-air lines must be closed and secured against a restart.
– Never point compressed air at living beings.
– Activate the extraction point to depressurize the diaphragm pump.

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.

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.

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.

7.2 General maintenance information

Even with intended use by environmental influences, the service life of hose lines and pipelines is limited. As a preventative measure, all hose lines and pipelines should be replaced regularly in accordance with their load.

The following sections describe the maintenance work that is required for optimal and fault-free operation of the device.

Check wearing parts such as seals at regular intervals. The level of wear depends on the abrasiveness of the spray fluid used. Escaping air and spray fluid are signs that parts are worn. Contact Krautzberger Customer Care with any questions on maintenance work and maintenance intervals.

7.3 Maintenance schedule

The following sections describe the maintenance work that is required for optimal and fault-free operation of the device. Check wearing parts such as seals, nozzles and needles at regular intervals. The level of wear depends on the abrasiveness of the spray fluid used. Escaping air and spray fluid as well as the deterioration of the spray pattern are signs that parts are worn. In case of questions about maintenance work and intervals, contact the manufacturer; see contact information on the last page.

Interval	Maintenance work	Personnel
After each use	Clean diaphragm pump (*Chapter 7.4 'Clean the diaphragm pump' on page 28*)	Specialised personnel
if needed	Replace valve parts (*Chapter 7.5 'Replace valve parts' on page 29*)	Specialised personnel
	Replace diaphragm (*Chapter 7.6 'Replace the diaphragm' on page 31*)	Specialised personnel

7.4 Clean the diaphragm pump

WARNING!

Risk of injury due to improper cleaning!

– Adhere to the safety data sheets of the cleaning product manufacturer.
– Do not use any halogenated cleaning products.

1. Interrupt the compressed air supply in a suitable location (e.g. shut-off device).
2. Dip the fluid intake hose into a suitable detergent.
3. Switch on the compressed air supply.
4. Rinse out the diaphragm pump by activating the extraction point until only detergent liquid escapes.
5. Disconnect the compressed-air supply.
6. Leave detergent liquid in the pump.
7. Clean the outside of the device with a cloth dipped in cleaning solution.

7.5 Replace valve parts

Special tool:

- Special pulling tool

1. Clean diaphragm pump (*Chapter 7.4 'Clean the diaphragm pump' on page 28*).
2. Make sure that the compressed air supply is switched off.
3. If necessary, depressurise the material by actuating the extraction point.

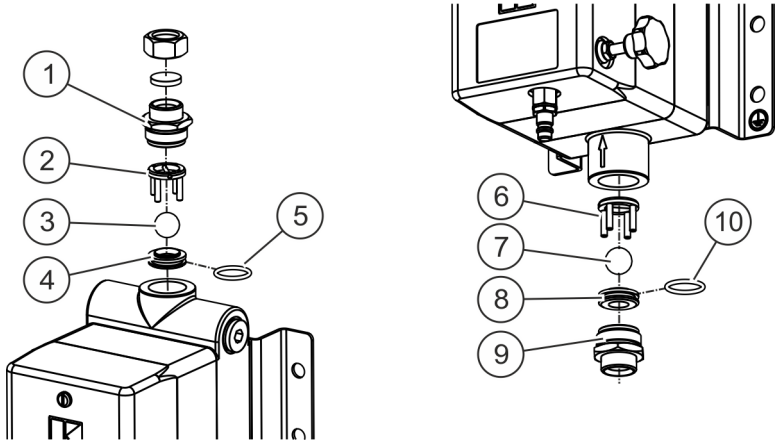


Fig. 7: Valve parts

4. Unscrew the double nipple (Fig. 7/1 and 9).
5. Remove the ball guides (Fig. 7/2 and 6) and valve balls (Fig. 7/3 and 7).
6. Remove the valve seats (Fig. 7/4 and 8).

Required special pulling tool is included in the tool kit (article no. 120-0638).

7. Check all parts for damage and wear and replace them as necessary.
8. Clean the valve housing.

The double nipples (Fig. 7/1 and 9) are inserted with glue for solvent-proof screw sealing. This glue must be removed completely.

9. Grease valve housing and O-rings (Fig. 7/5 and 10) slightly.

10. Make sure that the O-rings (Fig. 7/5 and 10) are mounted correctly on the valve seats.

11. Mount the valve seats (Fig. 7/4 and 8).

12. Insert the ball guides (Fig. 7/2 and 6) and valve balls (Fig. 7/3 and 7).

13. Apply glue to the double nipples (Fig. 7/1 and 9) for solvent-proof screw sealing and screw in.

14. Clean the diaphragm pump (*Chapter 7.4 'Clean the diaphragm pump' on page 28*) and perform a test run (*Chapter 6.4 'Start-up' on page 25*).

7.6 Replace the diaphragm

Disassembly

1. Clean diaphragm pump (*Chapter 7.4 'Clean the diaphragm pump' on page 28*).
2. Make sure that the compressed air supply is switched off.
3. If necessary, depressurise the material by actuating the extraction point.

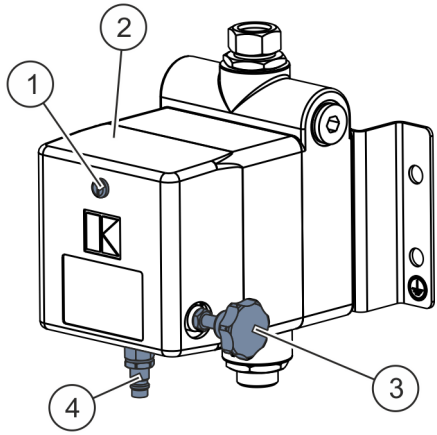


Fig. 8: Cover hood

4. Remove the compressed air connection (Fig. 8/4).
5. Unscrew the star handle (Fig. 8/3) from the pressure regulator.
6. Unscrew the screw (Fig. 8/1) and remove the cover hood (Fig. 8/2).

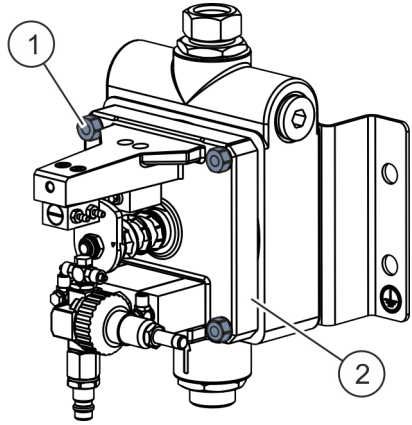


Fig. 9: Timing case

7. Loosen all 4 nuts (Fig. 9/1) and remove the timing case (Fig. 9/2).

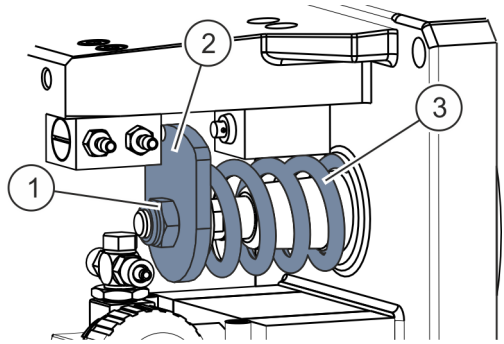


Fig. 10: Pressure disc and spring

8. Loosen nut (Fig. 10/1) and remove pressure disc (Fig. 10/2) and pressure spring (Fig. 10/3).

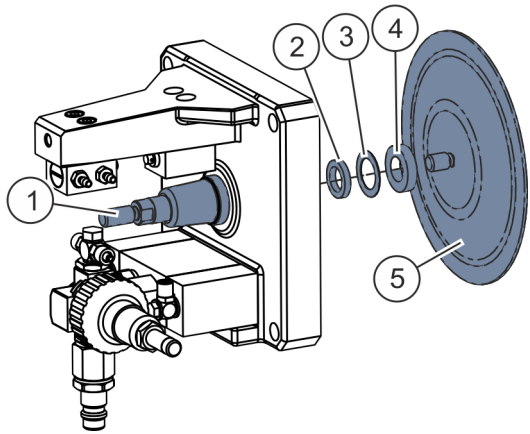


Fig. 11: Diaphragm

9. Unscrew the diaphragm (Fig. 11/5) from the bolt (Fig. 11/1).

10. Remove the slotted ring (Fig. 11/4), washer (Fig. 11/3) and felt flat seal (Fig. 11/2) and check for damage and wear. If necessary, replace parts.

11. Oil the felt flat seal (Fig. 11/2).

12. Clean contact surfaces of the timing case.

Installation

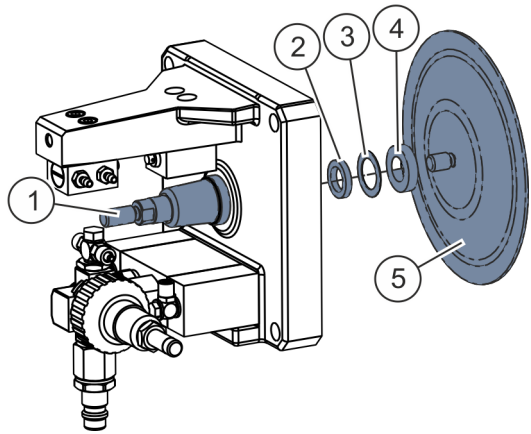


Fig. 12: Diaphragm

1. Insert felt flat seal (Fig. 11/2), washer (Fig. 11/3) and slotted ring (Fig. 11/4).

2. Screw new diaphragm (Fig. 11/5) firmly onto the bolt (Fig. 11/1).

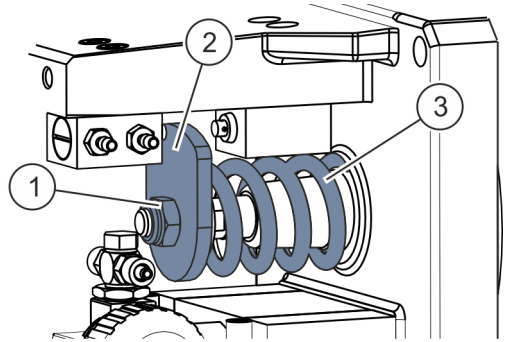


Fig. 13: Pressure disc and spring

3. Insert the pressure springs (Fig. 13/3) and pressure disc (Fig. 13/2) and screw with the nut (Fig. 13/1).

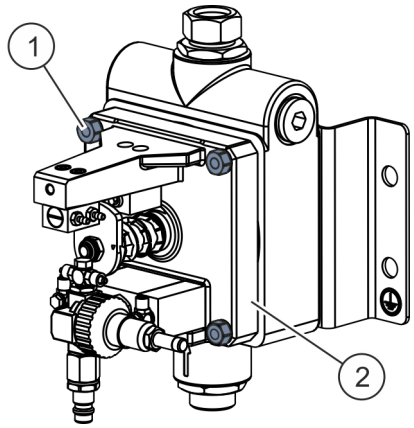


Fig. 14: Timing case

4. Screw on the timing case (Fig. 14/2) evenly with the nuts (Fig. 14/1) and tighten, torque: 20 Nm.

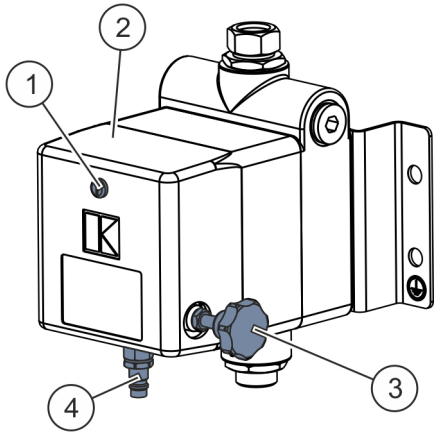


Fig. 15: Cover hood

5. Attach the cover hood (Fig. 15/3) and tighten it with the screw (Fig. 15/4).

6. Screw in the compressed air connection (Fig. 15/1).

7. Screw on the star handle (Fig. 15/2) of the pressure regulator.

8. Perform test run (*Chapter 6.4 'Start-up' on page 25*).

8 Troubleshooting

Personnel:

- Qualified personnel

Protective equipment:

The selection of the personal protective equipment depends on the utilised medium of the system 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 personal protective equipment.

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

Error	Cause	Remedy
Air bubbles in the material container	Suction line loose/leaking	Check suction line, tighten if necessary.
	Defective seal	Replace seal (↳ *Chapter 7.5 'Replace valve parts' on page 29*).
	Diaphragm faulty	Replace diaphragm (↳ *Chapter 7.6 'Replace the diaphragm' on page 31*).
Diaphragm pump runs unevenly	Foreign bodies in the ball valve or worn valve	Check ball valve, replace if necessary.
	Air is sucked in	Check suction direction.
	Suction line blocked	Check suction line, clean if necessary.
	Valve balls/valve seat soiled/ leaking	Clean/replace valve balls/valve seat (↳ *Chapter 7.5 'Replace valve parts' on page 29*).
Pump does not start up	No compressed air available	Switch on or check compressed air supply.
Pump works but no pressure builds up or no suction	Intake screen soiled	Clean intake screen.
	Suction hose is kinked	Check suction hose.
	Valve ball/valve seat soiled	Clean valve balls/valve seat (↳ *Chapter 7.5 'Replace valve parts' on page 29*).
	Valve blocked	Clean valve, rinse pump.

Error	Cause	Remedy
	Valve ball/valve seat worn	Replace valve balls/valve seat (*Chapter 7.5 'Replace valve parts' on page 29*).
	O-ring, defective	Replace O-ring (*Chapter 7.5 'Replace valve parts' on page 29*).
Pressure fluctuations during operation or unusual running noises	Diaphragm worn	Replace diaphragm (*Chapter 7.6 'Replace the diaphragm' on page 31*).

How to act in case of dangerous faults

In principle, the following applies:

1. In the event of malfunctions that present an immediate risk for persons or property values, immediately switch off the system.
2. Determine cause for malfunction.
3. Inform responsible party at the operating site about the malfunction.
4. In the event that the troubleshooting requires work in the hazard zone, switch off the system and secure it against a restart.
5. Depending on the type of malfunction, eliminate the malfunction or have it eliminated by an authorized specialist.

If the fault is not included in the following table or if it cannot be eliminated with the measures described, contact Customer Care.

8.1 Customer Care

Krautzberger GmbH

Customer service

Stockbornstr. 13

65343 Eltville am Rhein

+49 6123 - 698151

customercare@krautzberger.com

9 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*

9.1 Spare parts

A complete spare part overview is available on the website of Krautzberger GmbH:

www.krautzberger.de

10 Accessories

There are a wide range of accessories available for the diaphragm pumps. 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:

- Pressure compensation tank with removable cleaning cover and pressure gauge for balancing out the pulsation and displaying the set material pressure
- Suction devices in various designs, with filter basket
- Pressure pipe with pressure gauge for displaying the set material pressure
- Material filter with drain valve
- Material pressure controller for absolutely constant material pressure, even in very low pressure ranges
- Pneumatic driven lifting devices
- Carriage with depositing surface
- Wall bracket
- Stand to hold wall console
- Container lids for diaphragm pump build-up
- Mount for lid installation
- Material drain valve
- ... and other accessories

11 Disassembly and disposal

11.1 Safety

Personnel:

- Qualified personnel

Protective equipment:

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

WARNING!

Risk of injury due to improper disassembly!

Residual stored energies, component edges, points and corners on or in the device or on the required tools may cause injuries.

- Make sure you have sufficient space before starting the work.
- Carefully handle open, sharp edged components.
- Keep the workplace orderly and clean! Loosely stacked or scattered components and tools are sources for accidents.
- Properly dismantle components. Pay attention to very high individual weight of some of the components. If necessary, use hoisting equipment.
- Secure components so that they cannot fall or tip over.
- If questions arise, consult with the customer service from Krautzberger.

11.2 Disassembly

Prior to starting the disassembly:

- Switch off the device and secure it against 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.

11.3 Disposal

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 fluid residue separately from the device.

If in doubt, obtain information about environmentally-appropriate disposal with the local municipalities or specialised disposal companies.

12 Technical data

12.1 Dimensions and weight

Specification	Value	Unit
Width	200	mm
Height	229	mm
Length	210	mm
Weight	5.0	kg

12.2 General specifications

Specification	Value	Unit
Delivery rate (with reference to water, free flow)	10	l/min
Fluid connection (outlet)	Thread 1/2 female thread	Inches
Max. temperature of the coating material used	0 ... +50	°C
Max. pressure	6.5 (94.3)	bar (psi)
Max. permitted operating pressure	8 (116)	bar (psi)
Compressed air connection (hose sleeve)	8/9	mm
Min. air intake pressure	4 (58)	bar (psi)
max. air intake pressure	8 (116)	bar (psi)
Max. stroke (double strokes)	120	DS/min
Recommended number of strokes (double strokes)	100	DS/min
Air consumption (at 8 bar)	80	l/min
Transmission ratio	1:1	-
Compressed air supply	oil-free, filtered	-

12.3 Material delivery properties

Material	Suitability
Paint (with solvent)	good
Water-based paint, dispersions, wood preservatives	good
Water	good
Oils, heating oils, diesel fuel	good
Emulsions, soap, detergents	good
Alcohol, glazes, latex	limited
Lime sludge	limited
Cell and fibre materials	unsuitable
Sludge, mash, pastes	unsuitable

If in doubt, contact Krautzberger Customer Care about the suitability of materials that are not listed. In special cases we will determine the suitability in a trial.

12.4 Dimensions

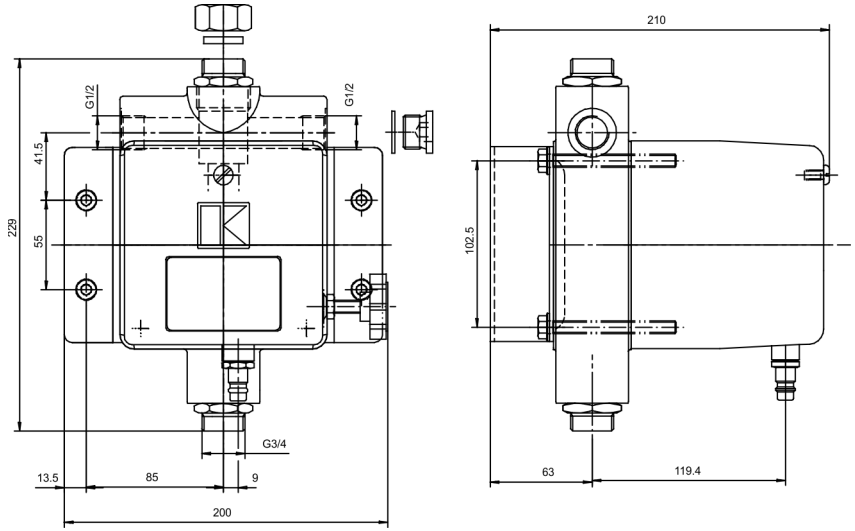


Fig. 16: Dimensions

13 Declaration of conformity

Krautzberger

EC-/EU- Declaration of Conformity
under the EC-Treaty / EU Constitution

The manufacturer
Krautzberger GmbH, Stockbornstr. 13, 65343 Eltville, Deutschland

hereby declares that the following product

Product name:	Diaphragm pump
Fabrikat:	MP 100
Article number::	200-0104
Marking to Atex:	-

the relevant harmonisation legislation of the Union until 19 April 2016, as applicable and regulations applicable from April 20, 2016 and the other applied directives / standards (following) - including their changes applying at the time of the explanation – corresponds.

Following guidelines were applied:

Machine directive 2006/42/EC appendix II 1.A

The following national and international standards and specifications have been applied:

EN 809:1998+A1:2009
EN ISO 12100-1:2003/A1:2009
EN ISO 12100-2:2003/A1:2009
DIN EN 12639
EN ISO 14121-1:2007

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

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

Place: Eltville
Date: 19.10.2016

Jörg Blumrich(Head of Design/Development)

Seite **1** von **1**

Fig. 17: Declaration of conformity

14 Notes

15 Index

W

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