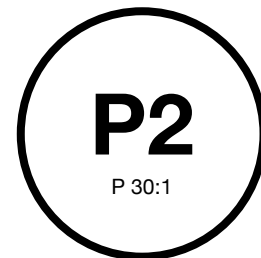
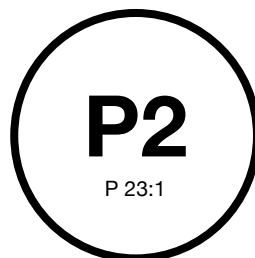
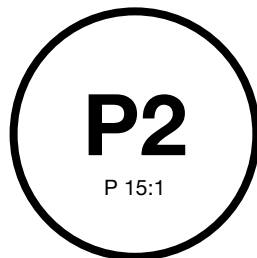
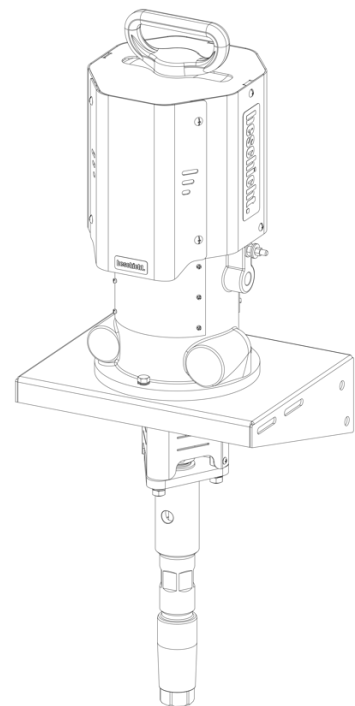
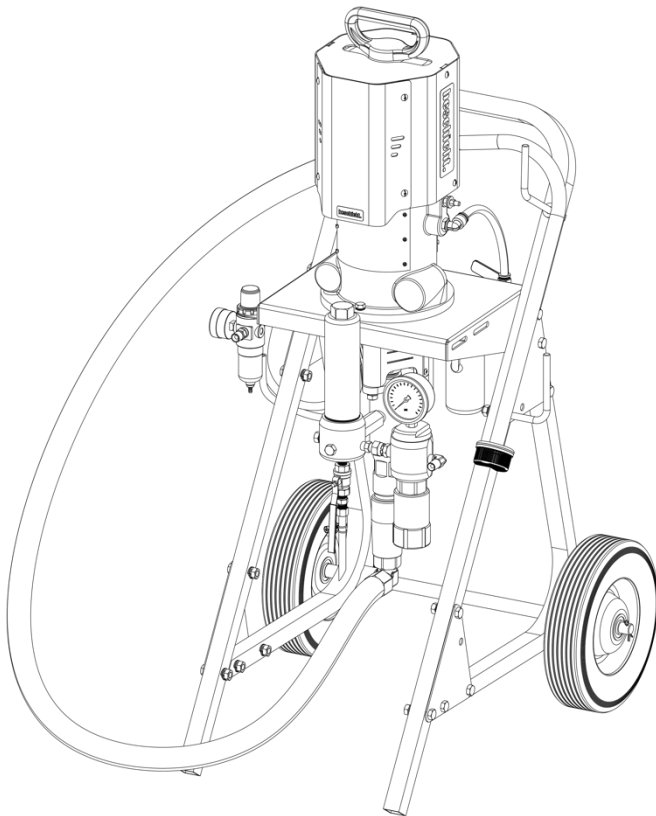


# Operating Manual P2

## Pneumatic piston pump



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## 1. Table of contents

These operating instructions contain information on the operation, repair and maintenance of the device.

Only use the device in accordance with these instructions. The operating instructions are available in German and English.

Always keep these operating instructions available at the place of use of the device. Local guidelines for occupational safety and accident prevention regulations must be always observed.

## 2. General Safety Instructions

### 2.1. Introduction

The following are general warnings concerning the setup, use, grounding, maintenance, and repair of this equipment.

Additional, more specific warnings can be found in the main body of these operating instructions.

### 2.2. General notes

- Provide electrical devices and equipment according to local safety requirements regarding operating mode and environmental influences.
- Ensure that the device is only operated and repaired by trained personnel.
- Ensure that the floor of the work area is antistatic.
- Ensure that all persons within the work area wear antistatic shoes.
- Paint mist extraction equipment to be provided by the customer in accordance with local regulations.
- Use material hoses/air hoses adapted to the working pressure.
- Use personal protective equipment (respiratory and skin protection, safety goggles).
- Ensure that there are no ignition sources such as open flames, sparks, glowing wires or hot surfaces in the vicinity.
- Never point the spray gun at persons.
- Never reach into the spray jet.
- Before carrying out any work on the unit, in the event of work interruptions or malfunctions: Disconnect the power and compressed air supply.
- Secure the spray gun against operation.
- Depressurize spray gun and equipment.
- When operating the spray gun, ensure that it is standing securely.
- Only hold the spray gun in one position for a short time.

### 2.3. Device grounding

Due to the flow velocity at spraying pressure, electrostatic charges may occur on the unit under certain circumstances.

These can cause sparks or flames when discharged. Ensure that the device is grounded at all time.

- Ground the workpieces to be coated.
- Ensure that all persons within the work area are grounded, e.g. by wearing antistatic shoes.
- Wear antistatic gloves when spraying for grounding via the spray gun handle.

## 2.4. Safety measures when using high pressure hoses

Make sure that the hose material is chemically resistant to the material being sprayed and is suitable for the pressure generated in the equipment. The pressure generated by the pump is a multiple of the inlet air pressure.

The manufacturer, operating pressure, date of manufacture, etc. must be visible on the high-pressure hose used.

High-pressure hoses may only be laid in suitable locations. Never install in busy areas, on sharp edges, moving parts or hot surfaces.

When the pump sucks liquid from a closed container: ensure that air or a suitable gas can enter the container. This prevents negative pressure and thus further damage.

## 2.5. Hazardous liquids, varnishes and paints

- For paint preparation, processing and equipment cleaning, observe the processing instructions of the manufacturers of the paints, solvents and cleaners used.
- Take prescribed protective measures, in particular wear safety goggles, protective clothing and gloves and, if necessary, use skin protection cream.
- Use respirator mask or breathing apparatus.
- For sufficient health and environmental protection: Operate the device in a spray booth or on a spray wall with the ventilation (extraction) switched on.
- When using coating materials with a temperature above 40°C, apply appropriate warning labels.

## 2.6. Incorrect operation of the pump



Incorrect use of the pump can lead to damage or malfunction of the pump and thus to serious injuries.

- This pump is intended for professional use only.
- Read all operating instructions, signs and labels before operating the pump.
- Use the pump only for its intended purpose.
- Do not alter or modify this pump.
- Check the pump daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the components with the lowest nominal value of this system.

- Route high pressure hoses used with this equipment away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not expose the high-pressure hose to temperatures above 180°F (82°C) or below -40°F (-4°C).
- Do not lift the pressurized pump.
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state and national fire, electrical and safety codes.

## 2.7. Health hazard



- Leaking liquids or toxic fumes can cause serious injury or death to operators. Therefore, avoid any contact with leaking liquids or toxic vapors.
- Before using the equipment, also familiarize yourself with the specific hazards of the material to be processed.
- Store hazardous liquids (dangerous substances) in approved containers and dispose of them in accordance with locally applicable guidelines and laws.
- Always wear protective safety glasses, gloves, suitable clothing and a respirator. Adhere to the specifications of the material manufacturer.

## 2.8. Fire and explosion hazard



- Improper grounding, poor ventilation, open flames, or flying sparks create a hazardous work environment and can result in a fire or explosion. Serious injury and death may result.
- Ground the equipment.
- Find out from the material manufacturer the conductivity of the material you are using.
- If static sparking occurs while using this equipment, stop using the pump immediately. Do not use the device until you have identified and corrected the problem.
- Provide adequate ventilation to prevent the buildup of flammable vapors from solvents or the material being processed.
- Safely discharge the exhaust air. If the diaphragm fails, the liquid will be sucked in together with the air.
- Keep the work area free of contaminants, including solvents, rags, and gasoline.
- Disconnect all devices in the work area from the power supply.
- Extinguish all open flames or pilot lights in the work area.
- Do not directly irradiate system parts with electrostatics.
- Warning: Do not strike the housing with rusty tools due to possible sparking, which may cause explosion.

### 3. Pump description

#### 3.1. Procedure

This pump is operated with compressed air. The compressed air comes from a compressor and drives the air motor (A), which then moves the material piston up and down in the material feed pump (H). The compressed air is supplied to the motor through the air regulator (B).

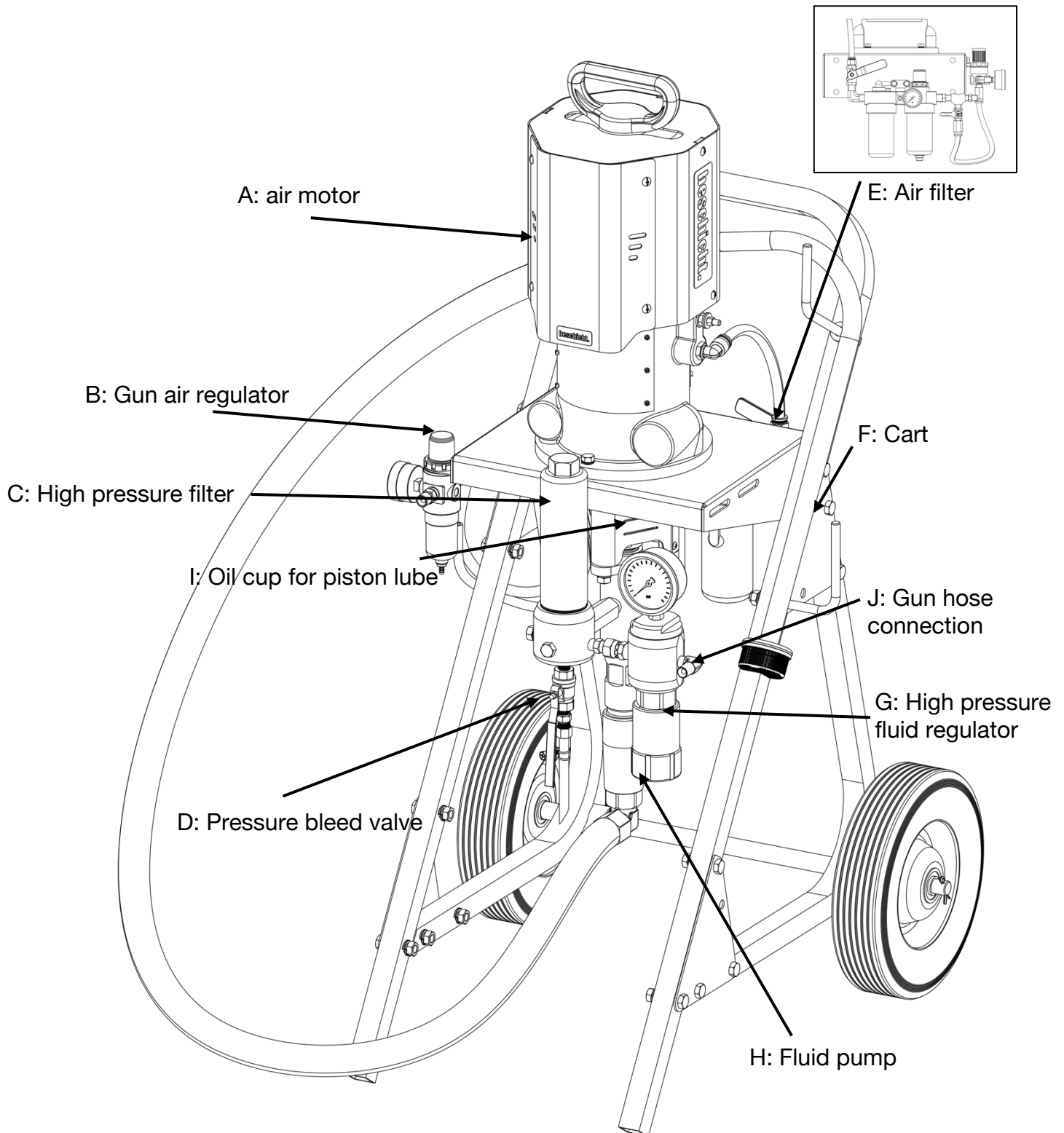
The pressure regulator (B) controls the air pressure allowed into the system and is proportional to the fluid pressure being produced.

Example: 100 PSI (6.9 bar) on the pressure gauge corresponds to 2300 PSI (158 bar) at the pump outlet (at a gear ratio of 23:1).

Upward movement of the piston causes the inlet valve to open automatically. When the piston moves downward, the outlet valve opens. The coating material flows under high pressure through the high-pressure hose to the spray gun. As it exits the nozzle, the coating material atomizes. The atomization quality can be fine-tuned by adjusting the atomizing air at the gun as well as the material regulator (G) of the pump.

To ensure trouble-free operation, this pump is equipped with a high-pressure filter (C). The filter contains a 60-mesh stainless steel filter element to filter dirt particles from the material before it leaves the pump.

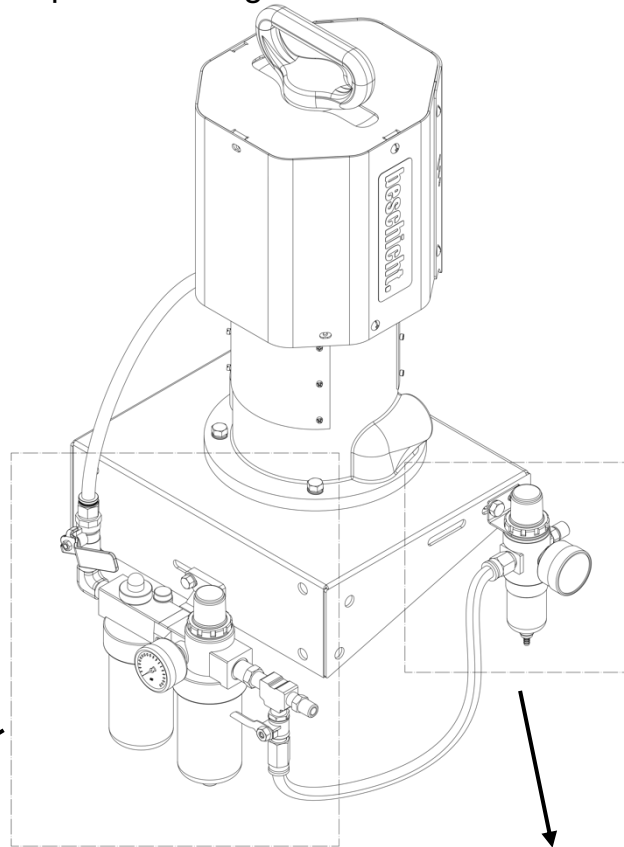
## 3.2. Explanation picture of the entire pump



Variations possible.

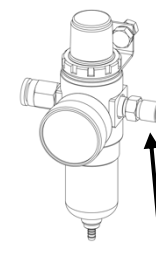
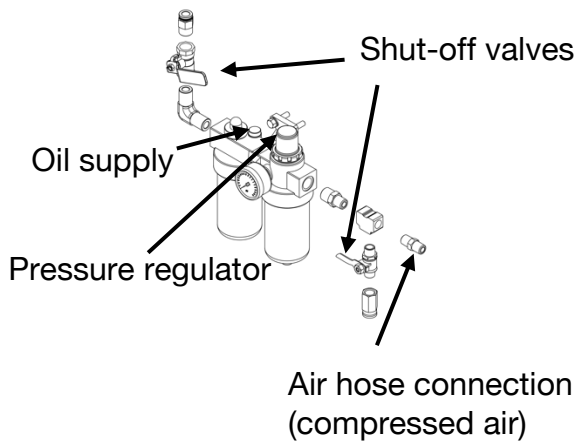
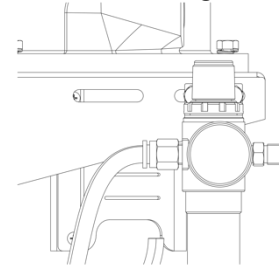
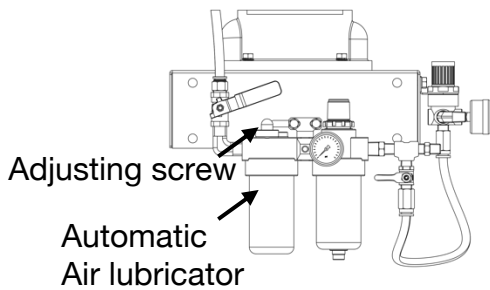


3.3. Explanation picture air regulator and air filter



E: Air filter

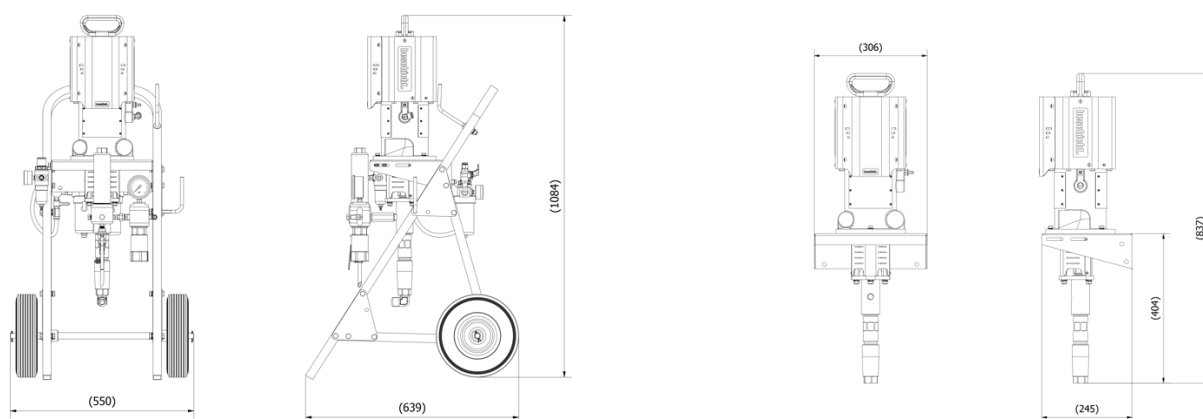
B: Gun air regulator/filter



Air outlet for air hose connection to spray gun

## 3.4. Technical data

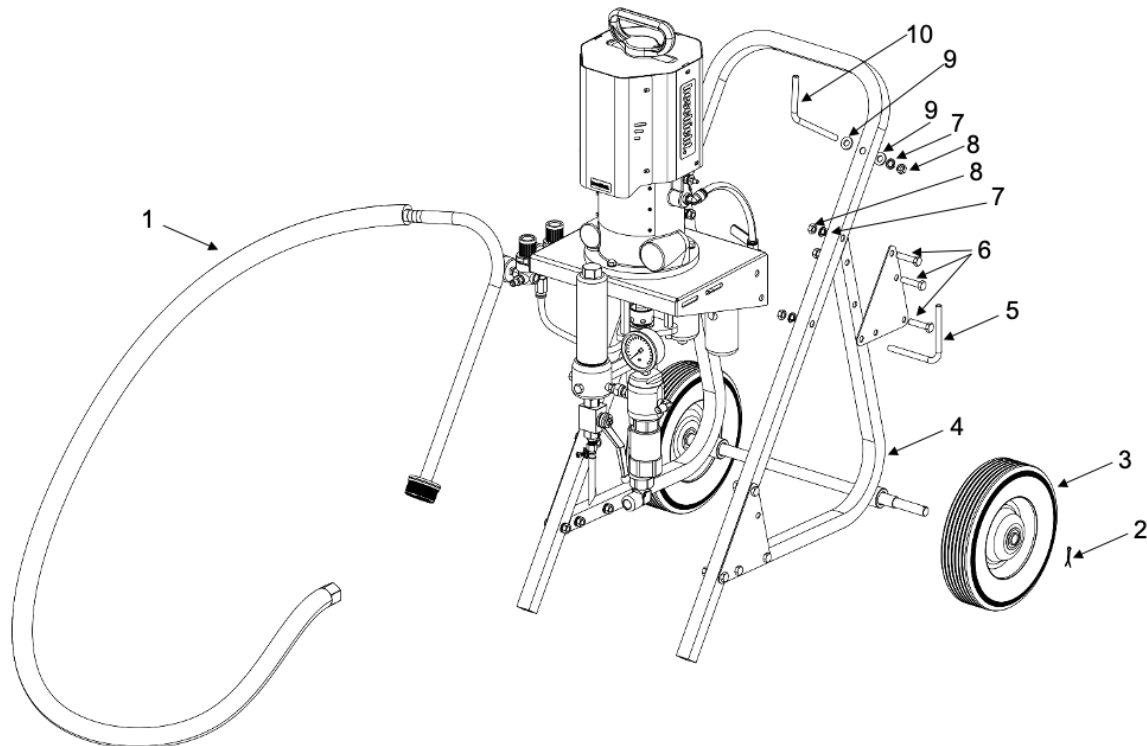
category	Daten P2 P 15:1	Daten P2 P 23:1	Daten P2 P 30:1
Air motor diameter	4"	4"	6"
Pressure Ratio	15:1	23:1	30:1
Volume per double stroke	54cm <sup>3</sup>	32cm <sup>3</sup>	62cm <sup>3</sup>
Max. operating pressure	124 bar (1.800 PSI)	190 bar (2.760 PSI)	248 bar (3.600 PSI)
Max. air inlet pressure	8,3 bar (120 PSI)	8,3 bar (120 PSI)	8,3 bar (120 PSI)
Max. stroke rate in operation	60 DH/min	60 DH/min	60 DH/min
Max. Volume flow	3,2 l/min	1,9 l/min	3,8 l/min
Size air inlet (Internal thread)	1/4pt	1/4pt	1/4pt
Fluid inlet (Internal thread)	1/2pt	1/2pt	3/4pt
Material inlet (Internal thread)	1/4pt	1/4pt	1/4pt
Air consumption, 8 bar air pressure	6 SCFM (0,17m <sup>3</sup> /min)	6 SCFM (0,17m <sup>3</sup> /min)	25 SCFM (0,71m <sup>3</sup> /min)
Min./max. Air inlet pressure	2/8,3 bar (29/120 PSI)	2/8,3 bar (29/120 PSI)	2/8,3 bar (29/ 120 PSI)
Max. sound pressure level (8 bar air p)	96 dB(A)	96 dB(A)	97 dB(A)
Net weight (Trolley included)	29/33 kg	27/31 kg	33/37kg
Filter insert high pressure filter	60 mesh		
Maximum material temperature	80 °C		



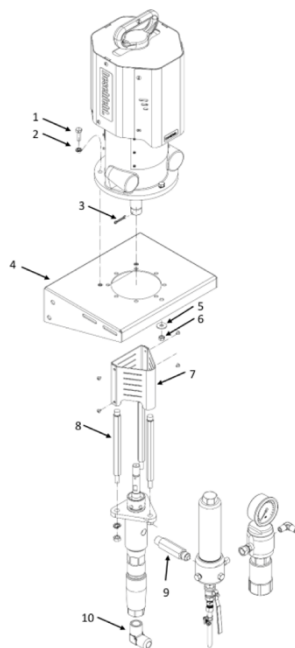
(shows P2 P 30:1)

## 4. Operation

### 4.1. Set-up and connect



- |    |                      |    |                       |
|----|----------------------|----|-----------------------|
| 1: | 1x suction hose      | 6: | 6x screw 3/8" x 2"    |
| 2: | 2x Pin 1/8 x 1"      | 7: | 8x spring washer 3/8" |
| 3: | 2x wheels 10" x 7,5" | 8: | 8x Mutter 3/8"        |
| 4: | 1x cart              | 9: | 2x washer 3/8" x 3mm  |
| 5: | 1x L screw           |    |                       |



- |     |                                    |
|-----|------------------------------------|
| 1:  | 3x screw 5/16" x 1"                |
| 2:  | 3x washer 5/16"                    |
| 3:  | 1x Pin 1/8 x 1-1/4"                |
| 4:  | 1x console                         |
| 5:  | 3x washer 5/16"                    |
| 6:  | 3x mother 5/16"                    |
| 7:  | 1x piston cover                    |
| 8:  | 3x steel beam                      |
| 9:  | 1x connector                       |
| 10: | 1x L connector 3/4 PT x 3/4 TH SUS |

1. Mount the pump securely (trolley or wall bracket).
2. Ground the device with the supplied grounding cable.
3. Install the suction system and the return pipe or return hose.
4. Install the high-pressure hose and gun on the pump fluid outlet.
5. Before each start-up, secure the gun, check pressures, check tightness of connecting parts, check hoses for damage.
6. Make sure the pump is depressurized, the gun is secured, and the air supply is shut off before operating the pump.
7. Make sure that the release agent container/piston lube is filled with sufficient release agent (filling level, approx. half) and check the release agent level regularly.
8. Before connecting the compressor air, close the shut-off valves, turn the pressure regulator to the lowest position (full counterclockwise rotation) and turn the return valve fully counterclockwise to open it.
9. The automatic air lubricator on the air filter provides lubrication of the air supplied to the system (air motor); fill with light oil and check the flow via adjusting screw (approx. 1 drop per minute).

#### 4.2. Initial start-up

Note: Flush the pump before first use. The pump is tested with light oil, which is used to protect the pump parts. If the materials you are using may be contaminated by the oil, flush the pump with an environmentally friendly solvent.

1. Place the empty collection container under the return pipe.
2. Place suction hose in container with cleaning agent (compatible with the material to be processed).
3. Set 0.5 bar on the pressure regulator.
4. Open the return valve.
5. Slowly open the shut-off valve.
6. Adjust the air pressure at the pressure regulator so that the pump runs evenly.
7. Rinse until clean cleaning agent runs into the collection container.
8. Close the shut-off valve, then close the return valve.
9. Hold the gun without the nozzle in the collection container and pull it off.
10. Open the shut-off valve slowly and flush until clean cleaning agent flows out of the gun.
11. Close the shut-off valve.
12. When the system is depressurized, close and secure the gun.
13. Dispose of the contents of the collecting beaker properly.

Flush the pump before first use, when changing colors or fluids, and before storing the pump. Never leave water or water-based fluid in the pump overnight.

Position the pump at the bottom of its stroke during overnight shutdown to prevent material from drying on the exposed displacer rod and damaging the packing.

Always flush the pump before the liquid dries on the piston rod.

To remove settled particles from the system, flush the entire system periodically (90 days or less is recommended).

#### 4.3. Filling with coating material

1. Place empty collection container under the return pipe.
2. Place the suction hose in the container with the working material.
3. Set approx. 0.5 bar on the pressure regulator.
4. Open the return valve and then slowly open the shut-off valve.
5. Adjust the air pressure at the pressure regulator so that the pump runs evenly.
6. As soon as pure coating material flows out of the return pipe, close the shut-off valve.
7. When the system is depressurized, close and secure the gun.
8. Close the return valve.
9. dispose of the contents of the collection container properly.

#### 4.4. Spraying

1. Secure the gun and insert the nozzle into the gun.
2. Slowly open the shut-off valve.
3. Set the desired working pressure on the pressure regulator.
4. Optimize the spray pattern according to the gun instructions and start the work process.
5. When interrupting work, close the gun and then close the shut-off valve.
6. Depressurize the system by pulling off the gun, close the gun and secure it.

## 5. Cleaning

Before cleaning:

- No electrical voltage on the device.
- Disconnect pneumatic supply line.
- Relieve device pressure.
- Use only solvent moistened rags and brushes for cleaning.
- Do not use hard objects.
- Never spray cleaning agent with a gun.

An explosive gas-air mixture forms in the closed container. When cleaning equipment with solvents, never spray into a closed container. Ground container.

Cleaning:

1. Clean the device regularly.
2. Fill the pump with preservative oil, operate the compressed air lubricator (engine oiling) and pump a few double strokes in the circuit.
3. Rinse the device.
4. If the high-pressure hose is clogged or the pressure has not been fully relieved after performing the above steps, loosen the coupling on the high-pressure hose gradually to relieve the pressure. Remove the hose completely to clean it thoroughly afterwards.
5. Check the oil level in the pump casing; fill the appropriate lubricating oil; it should be more than half full to prolong the life of the O-ring and packing.
6. After prolonged use of the pump, the packing and the O-ring under the casing may become loose due to wear; use appropriate tools to tighten the loose parts; no material should leak.
7. Clean the air filter regularly and rinse with warm soapy water if necessary.

Note: Please do not let the pump run dry. If the pump is operated too fast, there is a risk of premature wear. By reducing the operating air pressure, the speed can be reduced accordingly.

## 6. Maintenance

### 6.1. Daily

- Grease upper seals of the lower pump and clean intake filter.
- Check the drain through the air filter.
- Check the amount of lubricating oil.
- Make sure there is no fluid leaking from any connecting part or the pump.
- Make sure there are no cracks in the pump housing or piping.
- Check that all pump bolts are tight.
- Make sure that the connecting parts of the piping and peripheral equipment are not loose.
- Make sure that the relevant wearing parts have been replaced regularly and that their replacement is not overdue.

### 6.2. Regular

- Clean the high-pressure filter regularly with a suitable solvent when the unit is depressurized. Take extreme care, as the O-rings may not seal properly due to scratches etc.

- Material pressure regulator must be regularly maintained and lubricated and cleaned.
- The air motor should be serviced after approx. 1,500 operating hours. The maintenance measures include replacing the motor repair kit.
- The ink stage must be serviced if the upper packing leaks excessively or if the pump strokes become faster. Ensure sufficient lubrication of the parts during replacement.

## 7. Troubleshooting

### 7.1. Air motor

problem	cause	solution
Air motor is not working	Constricted ducts or inadequate air supply.	Clear line or increase air supply.
	Insufficient air pressure; closed or clogged valves, etc.	Open and clean the valves.
	Insufficient material absorption.	Check the air hoses or the pipe connecting the compressor air to the air motor.
	Damaged air valve; stalling.	Replace the valve.
	Air escapes from the O-ring.	Adjust or replace the O-ring.
Air motors work unsteadily	Insufficient air pressure; closed air valves etc.	Open and clean the valves.
	Air valve is loose; constricted line or insufficient air supply.	Tighten or replace.

### 7.2. Fluid pump

problem	cause	solution
Pump does not work.	Constricted line or insufficient air supply.	Clean; use higher air supply.
	Clogged material hose; material hose too small.	Clean; use larger hose.
	Material has dried on the displacer rod.	Clean.
	Dirty or worn parts of the air motor.	Clean or replace/repair.
Pump works, but low power on both strokes.	Constricted line or insufficient air supply.	Clean; use higher air supply.
	Clogged material hose; material hose too small.	Clean; use larger hose.
	Vent valve open.	Close.
	Air escapes into the supply container.	Check seal.
	Worn packing in the pump.	Replace.
Pump operates, but performance is low on downstroke.	Inlet valve held open or worn; worn seals.	Clean the valve; replace the seals.



## 8. Product liability

If third-party accessories and spare parts are used, liability may be waived in whole or in part.

With original accessories and spare parts, you have the guarantee that all safety regulations are fulfilled. For any extended warranty claims, please refer to our general terms and conditions.

We do not accept any warranty for damage caused or contributed to by the following reasons:

- unsuitable or improper use
- faulty assembly or commissioning by the purchaser or by third parties
- natural wear and tear
- incorrect handling or maintenance
- unsuitable coating materials
- substitute materials and chemical, electrochemical or electrical influences, provided that the damage is not attributable to any fault on our part
- wear caused using abrasive coating materials such as dispersions, glazes, liquid emery, zinc dust paints

Components not manufactured by beschichtpunkt GmbH are subject to the original manufacturer's warranty.

The replacement of a part does not extend the warranty period of the device.

The device must be inspected immediately upon receipt. To avoid loss of warranty, obvious defects must be reported to the supplier or to us in writing within 14 days after receipt of the device.

We reserve the right to have the warranty fulfilled by a contracting company.

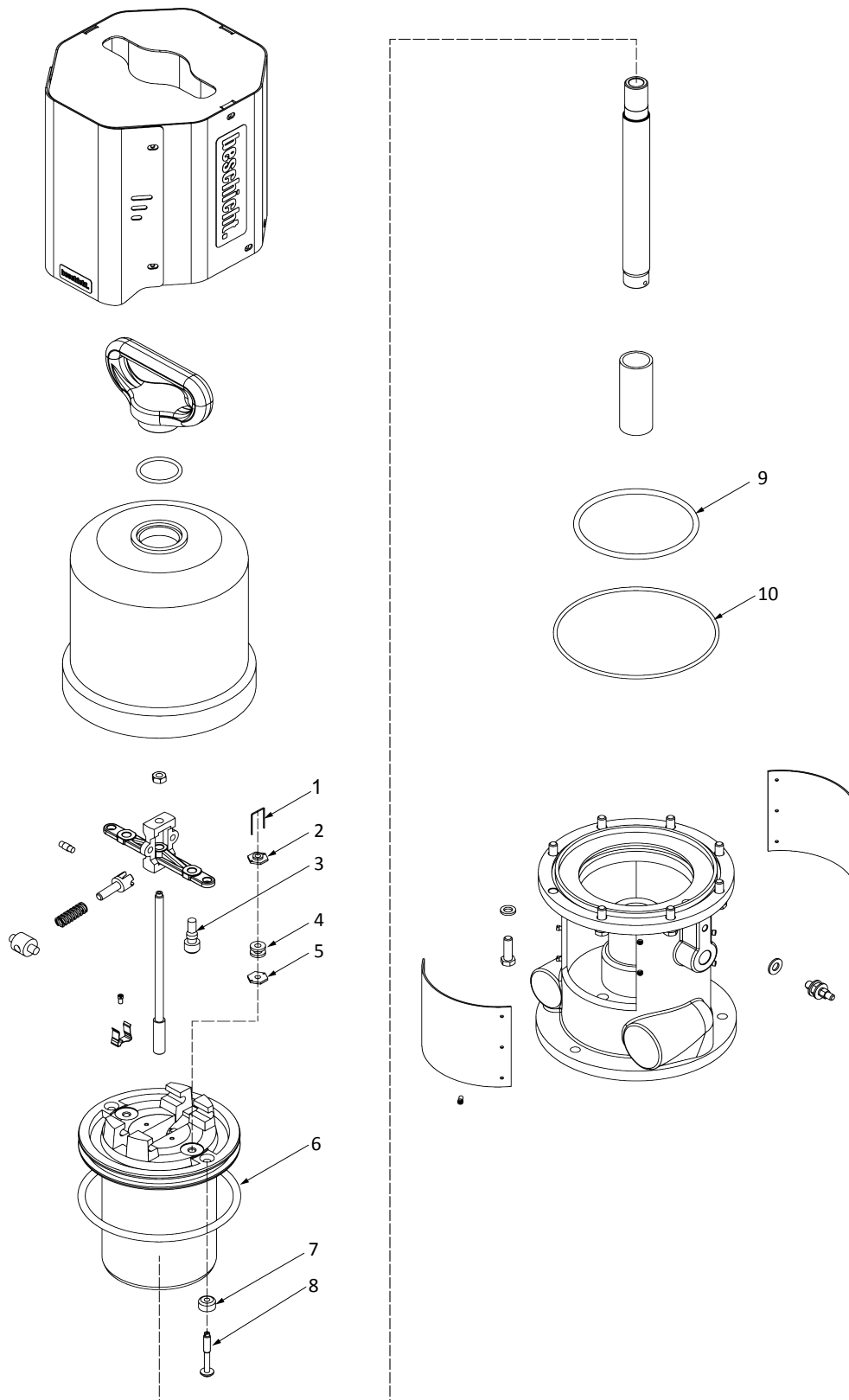
The performance of this warranty is dependent on proof by invoice or delivery bill. If the examination shows that there is no claim for warranty, the repair is at the expense of the buyer.

It is clarified that this warranty claim does not represent a limitation of the legal claims or the claims contractually agreed by our general terms and conditions.

If you use our products in a country in which an operating manual in the national language is required and this is not yet available from beschichtpunkt GmbH, please contact us before use.

## 9. Technical structure

### 9.1. Air motor



The labeled components have a limited-service life. Please check these parts regularly to ensure optimal performance of the device.

No.	Description	Quantity
01	Lockwire	2
02	Adjusting nut	4
03	Valve poppet <sup>1)</sup>	1
04	Grommet	2
05	Grommet	2
06	O-Ring <sup>1)</sup>	1
07	Valve stem poppet / valve stem	2
08	Valve stem poppet / valve stem	2
09	O-Ring <sup>1)</sup>	1
10	Seal, flat <sup>1)</sup>	1

<sup>1)</sup> These wear parts differ in size between P2 P 15:1 and 23:1, respectively, and P2 P 30:1

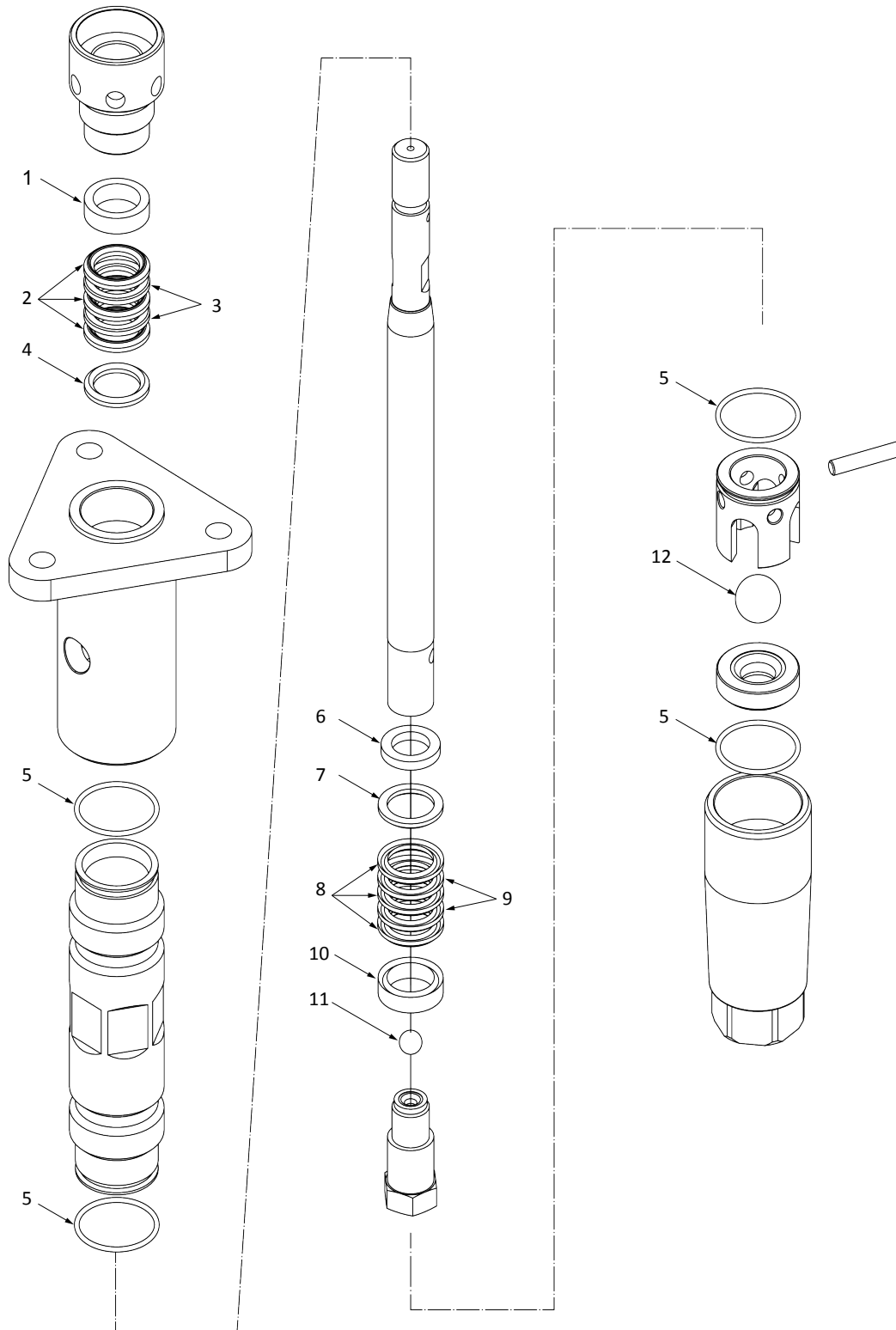
In order to replace the wear parts, we offer a spare part set for the respective engine consisting of the wear components listed above with the corresponding quantities:

- Z P2 P 15:1 & 23:1 Motor Repair Set (Art.-No. ZP223101)
- Z P2 P 30:1 Motor Repair Set (Art.-No. ZP230101)

Since the wearable O-rings (No. 06, 09, 10) must be changed more frequently, we also offer them as a spare parts set:

- Z P2 P 15:1 & 23:1 O-Ring-Set Motor (Art.-No. ZP223102)
- Z P2 P 30:1 O-Ring-Set Motor (Art.-No. ZP230102)

9.2. Fluid pump



The labeled components have a limited-service life. Please check these parts regularly to ensure optimal performance of the device.

No.	Description	Quantity
01	Gland, female	1
02	Packing, Teflon	3
03	Packing, leather	2
04	Gland, male	1
05	O-Ring, Teflon	4
06	3/8" ball, stainless steel	1
07	Retainer, stainless steel	1
08	3/4" ball, stainless steel	1
09	Packing, Teflon (für P 15:1&30:1 identisch mit Nr. 4 02)	3
10	Packing, Leather (für P 15:1&30:1 identisch mit Nr. 5 03)	2
11	Packungsmutter (für P 15:1&30:1 identisch mit Nr. 3 01)	1
12	Stutzen mit Wulst (für P 15:1&30:1 identisch mit Nr. 6 04)	1

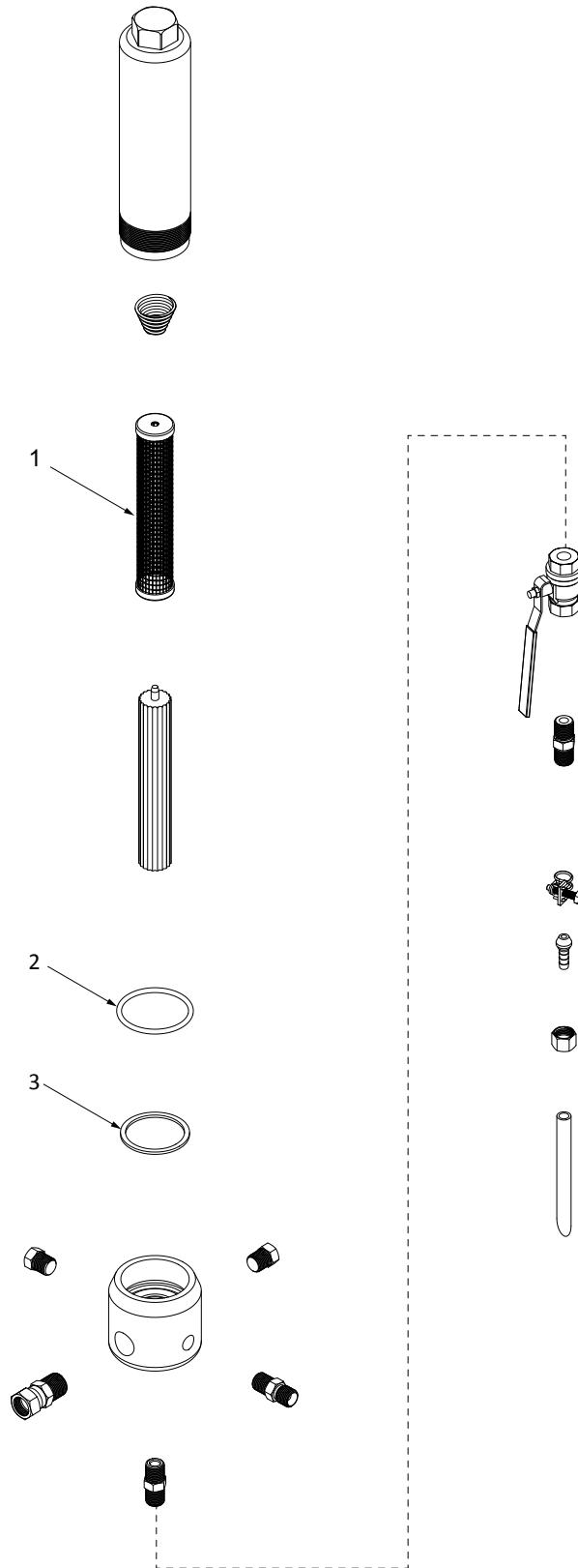
In order to replace the wear parts, we offer a spare part set for the respective fluid pump consisting of the wear components listed above with the corresponding quantities:

- Z P2 P 23:1 Material pump repair kit (Art.-No. ZP223103)
- Z P2 P 15:1 & 30:1 Material pump repair kit (Art.-No. ZP230103)

Since the packing wears out more frequently, we offer the corresponding packing parts as a separate spare parts set.

- Z P2 P 23:1 Lower packing kit (Art.-No. ZP223104)
- Z P2 P 15:1 & 30:1 Lower packing kit (Art.-No. ZP230104)

9.3. High pressure filter



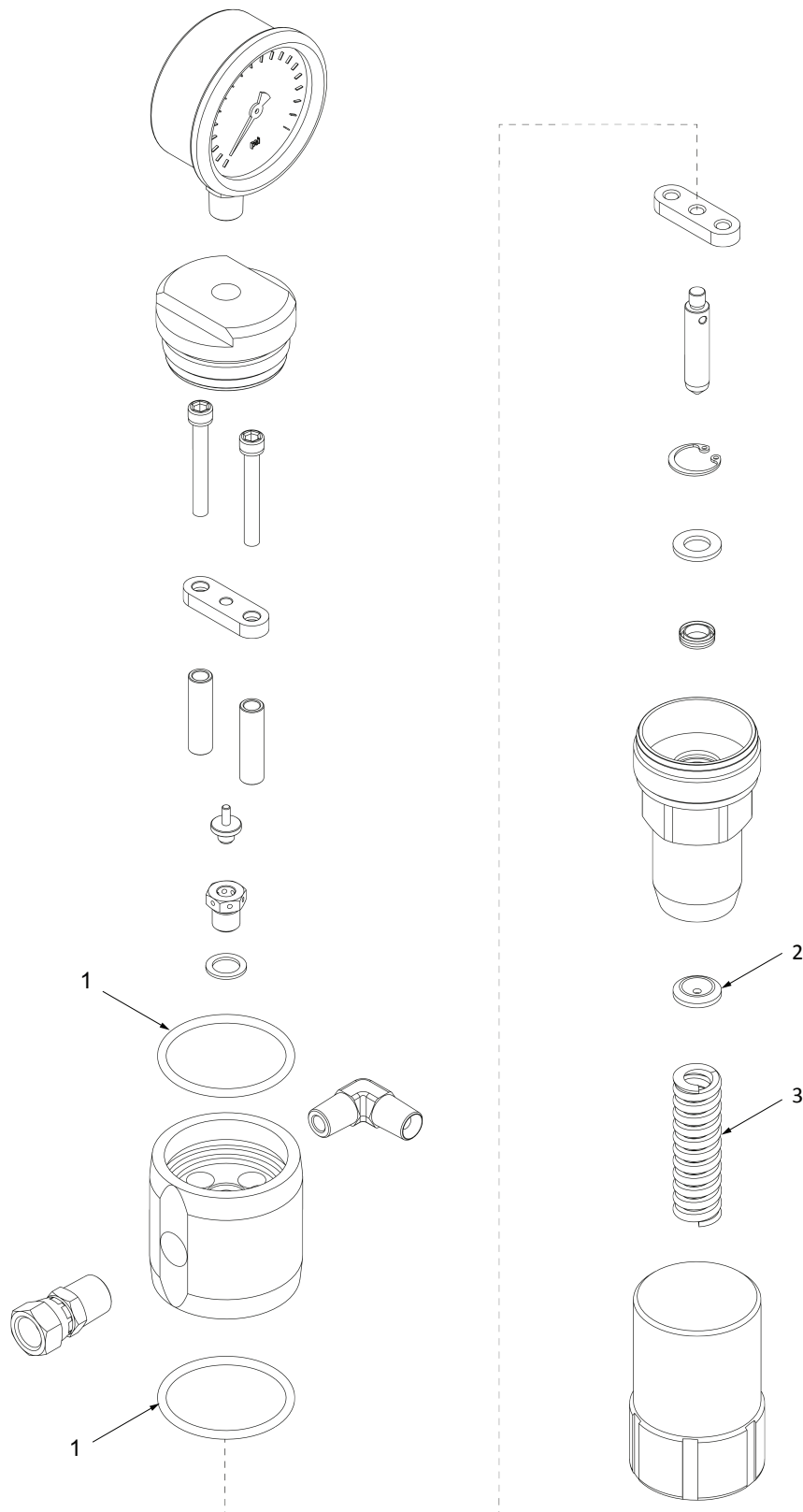
The labeled components have a limited service life. Please check these parts regularly to ensure optimal performance of the device.

No.	Description	Quantity
1	Filter, 60-mesh	1
2	O-Ring; PTFE	1
3	Gasket thinn; PTFE	1

To replace the wearing parts we offer the following spare parts for the high pressure pump (identical for P2 P 15:1 & 23:1 & 30:1):

- Z P2 P High Pressure Filter O-Ring (Art.-No. ZP200007)
- Z P2 P High Pressure Filter Repair Kit (Art.-No. ZP200008)
- Z P2 P High Pressure Filter (Art.-No. ZP200009)

9.4. High pressure fluid regulator







No.	Description	Quantity
01	O-Ring, Teflon	2
02	Spring locator	1
03	Spring	1

## 10. Declaration of conformity

We, the device manufacturer, declare under our sole responsibility that the product in the description below complies with the relevant basic safety and health requirements. In the event of a modification to the device not agreed with us or in the event of improper use, this declaration loses its validity.

Manufacturer	beschichtpunkt GmbH Halle 10 Graf-von-Soden-Straße 88090 Immenstaad
Part No.	P2231002, P2301002, P2151002
Applied standards and guidelines	
machinery, and amending Directive 2006/42/EG 2014/34/EU (explosive atmosphere) DIN EN ISO 12100:2010	
Specification within the meaning of Directive 2014/34/EU	
  II 2 G IIB c T3 X	
Authorized with the compilation of technical documentation: Wolfgang Merz beschichtpunkt GmbH, Halle 10, Graf-von-Soden-Straße, 88090 Immenstaad	
Special notes: X: Maximum material temperature 80°C. Maximum ambient temperature 60°C.	

01.Mai 2021, Wolfgang Merz  
(Managing Director)



**beschicht.**

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