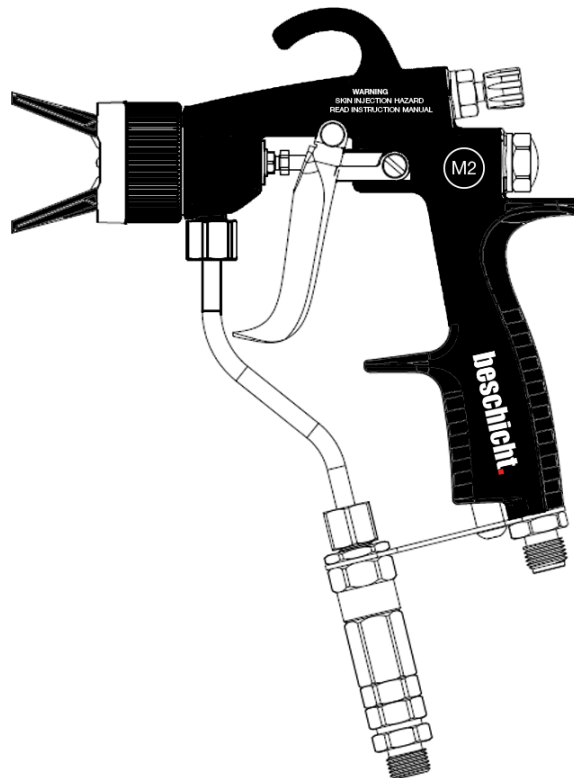


# Operating Manual M2

## Airless Plus Spray gun



## Table of Contents

<b>TABLE OF CONTENTS</b>	<b>2</b>
<b>1. ABOUT THIS MANUAL</b>	<b>3</b>
<b>2. GENERAL SAFETY INSTRUCTIONS</b>	<b>3</b>
2.1. FIRE AND EXPLOSION HAZARD	3
2.2. DANGER DUE TO INCORRECT OPERATION OF THE DEVICE	3
2.3. DANGER DUE TO PRESSURIZED DEVICE	4
2.4. HANDLING AND PROTECTION AGAINST HAZARDOUS LIQUIDS, VARNISHES AND PAINTS	4
2.5. MAINTENANCE AND REPAIR	4
2.6. PROTECTION AND MONITORING DEVICE	4
<b>3. DESCRIPTION</b>	<b>5</b>
3.1. STRUCTURE OF THE M2 GUN	5
3.2. FUNCTIONALITY	5
3.3. DATA	6
3.3.1. MATERIALS OF THE WETTED PARTS	6
3.3.2. TECHNICAL DATA	6
<b>4. DELIVERY SCOPE</b>	<b>6</b>
<b>3. OPERATION</b>	<b>7</b>
3.1. TYPICAL AIRLESS PLUS PAINT SYSTEM	7
3.1.1. AIR HOSES:	7
3.1.2. MATERIAL HOSES:	7
3.1.3. GROUNDING	8
3.1.4. PRESSURE RELIEF	8
3.1.5. MATERIAL PREPARATION	8
3.2. START UP	8
3.3. APPLICATION OF MATERIAL	8
3.4. ADJUSTING THE SPRAY PATTERN	9
3.5. CHANGING THE NOZZLE	9
3.6. CLEAN NOZZLE AND REMOVE NOZZLE CLOGGING	10
<b>6. POSSIBLE BUG FIXES</b>	<b>11</b>
<b>7. REPAIRS AND MAINTENANCE</b>	<b>11</b>
7.1. REPAIR PERSONNEL	11
7.2. REPAIR INSTRUCTIONS	11
7.3. CHANGE THE NEEDLE SEAL	12
7.4. ASSEMBLY NEEDLE CONNECTION SET	13
7.5. ASSEMBLY OF AIR CAP WITH NOZZLE GUARD	13
7.6. ASSEMBLY / MAINTENANCE OF SHAPED AIR AND AIR VALVE	14
7.6.1. SHAPED AIR	14
7.6.2. AIR VALVE	14
7.7. CHANGE FILTER	14
<b>8. SPARE PARTS AND ACCESSORIES</b>	<b>15</b>
8.1. NOZZLES AND FILTER SELECTION:	15
8.2. SELECTION OF THE AIR CAP:	15
8.3. SPARE PARTS LIST M2	16
8.4. HIGH PRESSURE HOSES	16
<b>9. PRODUCT LIABILITY</b>	<b>17</b>
<b>10. EG/EU – DECLARATION OF CONFORMITY</b>	<b>18</b>

## 1. About this manual

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

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

Keep these operating instructions available at the place of use of the device at all times. Local guidelines for occupational health and safety as well as accident prevention regulations must be observed at all times.

The operating instructions are available in German and English. In areas where German and English operating instructions are not permitted, the use is at the user's own risk and Beschichtpunkt GmbH accepts no liability whatsoever.

## 2. General Safety Instructions

The following safety precautions apply to the setup, use, grounding, maintenance, and repair of this equipment.

Additional product-specific warnings can be found at appropriate points in these operating instructions.

### 2.1. Fire and explosion hazard

Flammable vapors in the work area, such as solvent and paint vapors, can explode or ignite.

This will reduce the risk of fire and explosion:

- Ground all equipment in the work area.
- Provide adequate ventilation to prevent the buildup of flammable vapors from solvents or the material being processed
- Keep the work area free of debris, including solvents, rags and gasoline.
- If you notice sparking or feel an electric shock, immediately de-energize all equipment in the work area. Do not reuse the device until the problem has been solved.
- Always have a working fire extinguisher available in the work area.



### 2.2. Danger due to incorrect operation of the device

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

- This device is intended for professional use only.
- All applicable safety regulations must be observed.
- The device may only be used for the specified purpose.
- Changes or modifications to the device are not permitted.
- Inspect the device daily. Repair worn or damaged parts immediately or replace with original manufacturer's replacement parts.
- Never exceed the allowable working pressure or temperature of the lowest rated system component.
- Never point the spray gun at people or reach into the spray jet with any part of the body.
- Route hoses and cables used with this equipment away from traffic areas, sharp edges, moving parts, and hot surfaces.



- The high-pressure hose must not be exposed to temperatures above 82° C (180° F) and below -4°C (-40°F).

### 2.3. Danger due to pressurized device



Fluid leaking from the gun, leaking hoses, or ruptured parts can splash in the eyes or on skin and cause serious injury.

- Check and tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately
- The following information must be visible on the pressure hoses to be used: Manufacturer; permissible operating pressure, date of manufacture.
- Never kink hoses used and maintain defined bending radii.
- Never continue working with damaged hoses.
- Never work on the gun when the material hose is still mounted. If no work is being carried out on the gun, always engage the safety catch of the trigger lever.

### 2.4. Handling and protection against hazardous liquids, varnishes and paints



Before using the equipment, also familiarize yourself with the specific hazards of the material to be processed.



- During paint preparation, processing and cleaning, follow the processing instructions of the manufacturers of the paints, solvents and cleaners used.
- Take the prescribed protective measures, in particular wear protective goggles, protective clothing and gloves, and use a respirator or breathing apparatus (as recommended by the material and solvent manufacturers).
- Operate the equipment in a spray booth or on a spray wall with the ventilation (extraction) switched on.
- Prevent any contact with leaking liquids and prevent inhalation of toxic fumes.

### 2.5. Maintenance and Repair

Repairs and replacement of parts may only be carried out by a beschichtpunkt GmbH service center or a specially trained person.

- Only use original beschichtpunkt GmbH spare parts and accessories.
- Before performing any work on the equipment and during work interruptions:
  - Depressurize the spray gun, pressure hoses and all equipment.
  - Secure the spray gun against unintentional operation.
  - Switch off the energy and compressed air supply.
  - Observe the operating and service instructions for all work with the unit.

### 2.6. Protection and monitoring device

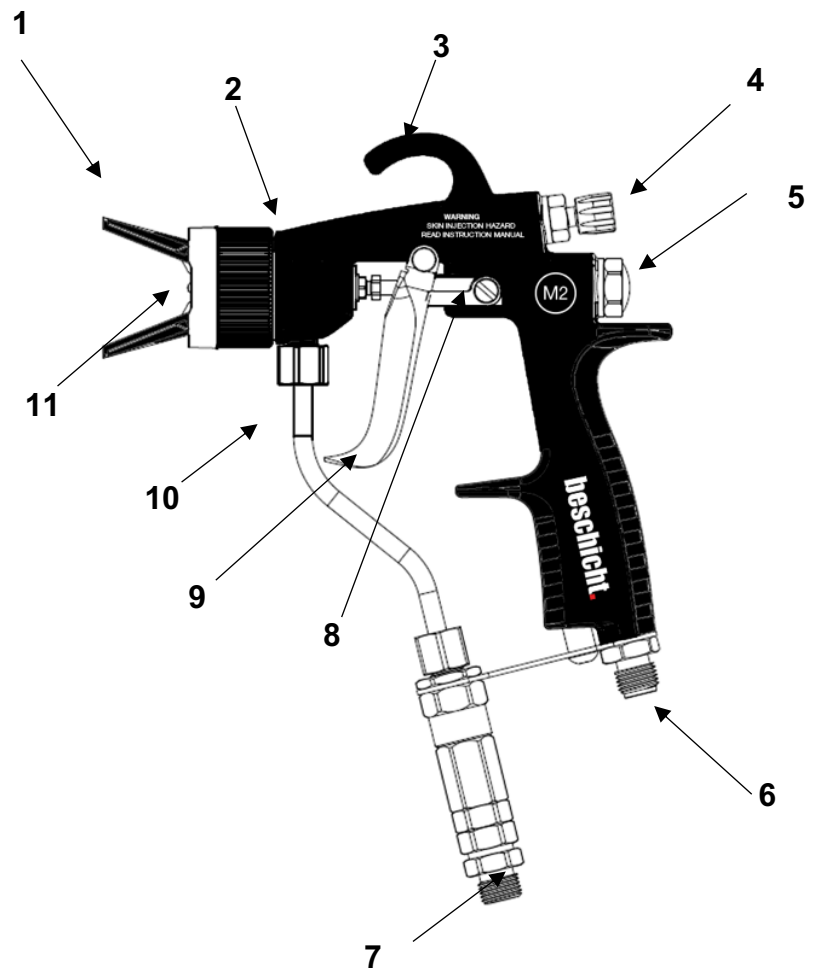
There is danger to life and possible damage to the device due to removal of protective and monitoring devices!

- The protection and monitoring devices must not be removed, modified or rendered ineffective under any circumstances.
- The function of these protection and monitoring devices must be checked regularly.
- In the event of defects in the protection and monitoring devices, the system or device must not be operated until these defects have been rectified.

## 3. Description

### 3.1. Structure of the M2 gun

No.	Description
1	Union nut with nozzle protection
2	Gun housing
3	Suspension hook
4	Shaped air controller
5	Spring cap
6	Air connection
7	Material connection with filter
8	Trigger lock
9	Trigger
10	Material manifold
11	Nozzle / air head



### 3.2. Functionality

When the trigger (9) is actuated, the atomizing air is released first. The material needle opens as soon as approx. half of the trigger travel has been actuated. The spray material thus reaches the material to be coated through the nozzle (11). The spray gun is closed in the reverse order.

The air volume for atomization is set in advance by an external air regulator.

The material flow rate depends on the diameter of the nozzle (11)

and the setting of the material pressure at the material feed or the material pressure regulator. With the forming air regulator (4), the spray pattern shape is adapted to the workpiece to be coated.

After the spraying process is completed, the trigger lock (8) is flipped over and the trigger is secured.

### 3.3. Data

#### 3.3.1. Materials of the wetted parts

metals	Stainless steel 1.4305
plastics	PTFE; POM; FKM; NBR

#### 3.3.2. Technical data

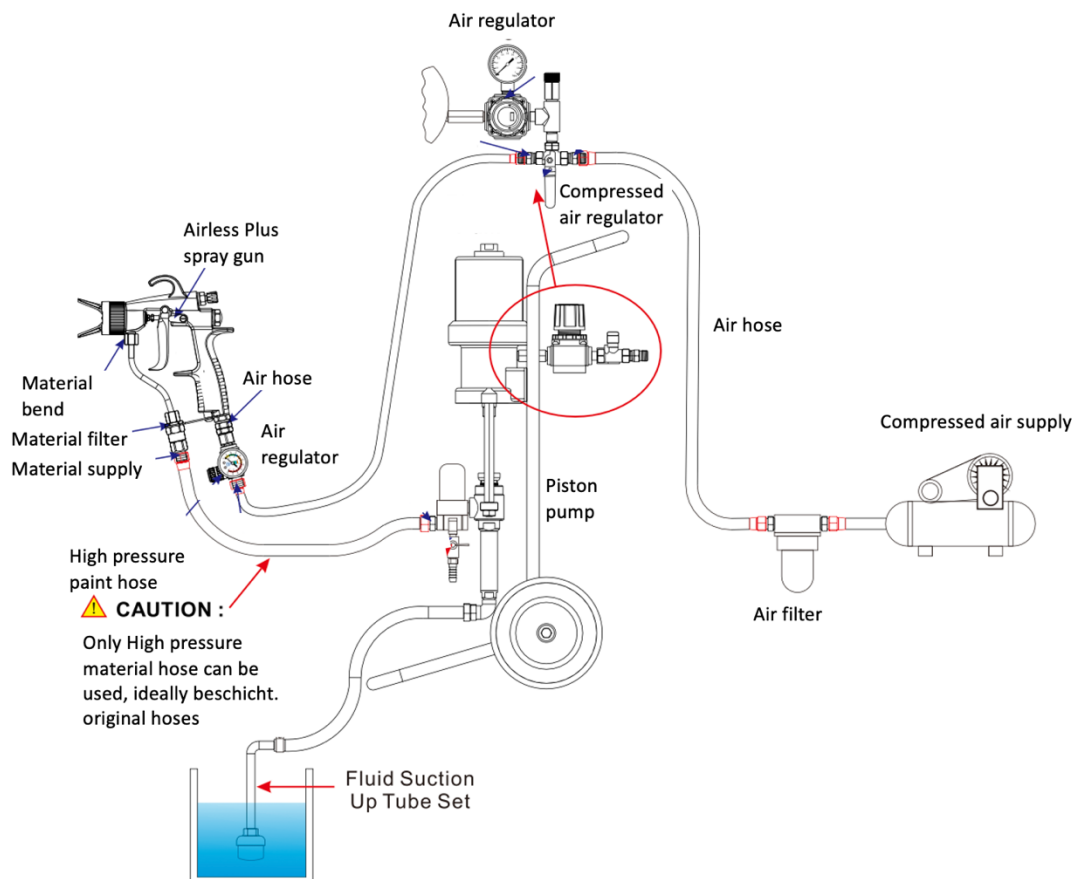
Description	Units	Value
Maximum air inlet pressure	bar; MPa; psi	8; 0.8; 116
Maximum material pressure	bar; MPa; psi	250; 25; 3625
Material connection	Inch	NPS ¼"
Air connection	Inch	BSP ¼"
Filter	Maschen	60 / 100 / 150 / 200
Weight	g	620
Range pH values Material	pH	3.5–9.0
Maximum temperature material	°C	50
Sound level at 0.3 MPa; 3 bar; 43.5 psi air pressure and 11 MPa; 110 bar; 1549 psi material pressure.	dB	80

## 4. Delivery Scope

- Gun
- Material filter
- Air cap
- 2x wrench
- Quick coupling
- Cleaning brush
- Operating Manual

## 3. Operation

### 3.1. Typical Airless Plus paint system



The beschicht. Airless Plus spray gun must be assembled with various components to form a complete spraying system. The picture shown is an exemplary representation.

It is important to familiarize yourself with all operating instructions and safety regulations of the respective components before commissioning and to strictly adhere to them.

#### 3.1.1. Air hoses:

The air filter on the compressed air system and the piston pump ensures that only clean, oil-free and dry air enters the gun. Dirty and oily atomizer air influences the spray pattern.

#### 3.1.2. Material hoses:

Ideally only use beschicht. high-pressure hoses. Caution: Bursting fittings and bursting hose, danger to life due to injection of material.

- The following information must be included on the high-pressure hoses: Manufacturer, operating pressure, date of manufacture.
- Fittings and material hose between material delivery and spray gun must be suitable for the pressure generated.
- Hose material must be chemically resistant to the material being sprayed.

### **3.1.3. Grounding**

Ensure that all device components and the workpieces to be coated are grounded. Establish a conductive connection between the paint container and the device.

### **3.1.4. Pressure relief**

Pressure relief must always be performed:

1. completion of spraying work
2. cleaning or maintenance on the spraying system
3. inspection or change of location of the spraying system
4. nozzle or filter change on the gun

The implementation of pressure relief:

1. fix the trigger safety on the gun.
2. close air supply at pump and relieve air pressure there.
3. release the trigger safety and pull the trigger to relieve the pressure.
4. flip the trigger safety on the gun.
5. relieve the pressure at the pump and leave it open.

If the material hose is clogged, carefully loosen the connections and release the residual pressure. If the nozzle is clogged, carefully loosen the union nut and release the residual pressure.

### **3.1.5. Material preparation**

To obtain the optimum coating result, please read the material manufacturer's data sheet carefully before commissioning.

## **3.2. Start up**

1. Secure the spray gun.
2. Attach the nozzle to the nozzle seal and then attach the air cap. Note the flats on the nozzle and air cap so that it drops in cleanly there. Press lightly and screw on the union nut including nozzle protection and tighten manually by hand.
3. Prepare the material in accordance with the parameters specified by the material manufacturer.
4. Connect material hose to connect spray gun and material supply.
5. Connect the air hose from a source of purified air to the spray gun.
6. Check all allowable pressures on the entire system.
7. Ensure that all parts on the complete system are grounded.
8. Set the operating pressure to 100 bar (1450 psi) and check the connections of the complete system for leaks with a suitable medium.
9. Loosen the trigger safety to release the trigger. Point the gun into an empty fluid container and slowly release the trigger until clean fluid comes out of the gun.
10. Relieve the pressure on the spray gun and the material feed and flip the trigger lock.

## **3.3. Application of material**

1. Set the material supply to approx. 80 bar (1160 psi) operating pressure.
2. Release the trigger lock and pull the trigger.
3. Adjust the spray pressure on the material feed until the optimum material atomization is achieved.



4. adjust the air pressure regulator on the material feed until optimum atomizing air is achieved.
5. adjust the forming air regulator on the gun.
6. Repeat this process of adjusting the mold air and atomizing air until the optimum spray pattern is achieved.
7. The material quantity can be adjusted by changing the material pressure or using a different nozzle.



No atomizing air      not enough atomizing air      perfect atomizing air

### 3.4. Adjusting the spray pattern

The shape of the spray pattern can be modified by the shape air regulator and thus ideally adapted to the spray object.

Different nozzle sizes can be used to achieve differently sized or small spray patterns.

Shaped air controller closed



Shaped air controller open

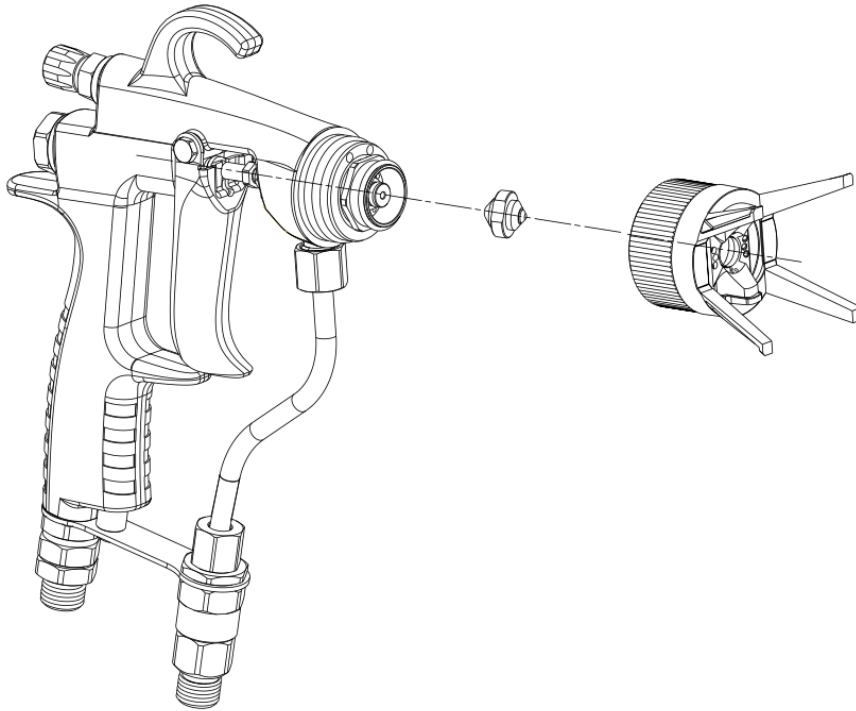


### 3.5. Changing the nozzle

1. Pressure relief on device and material supply
2. unscrew union nut and remove air cap.
3. Press the nozzle out of the air cap by hand and clean it with coat. Clean (ZCLE0001) and remove all existing paint residues.

Assembly of the nozzle:

4. Put the nozzle on the nozzle seal and then put on the air cap.
5. Note the flattening of the nozzle and air cap so that it falls cleanly into place.
6. Press lightly and screw on the union nut including the nozzle guard and tighten manually by hand.



### 3.6. Clean nozzle and remove nozzle clogging

**Note!**

Defective Airless Plus nozzle:

Change the nozzle in case of leakage.

Do not handle the nozzle with sharp-edged objects.

1. Relieve the pressure on the spray gun and fluid pressure generator.
2. lock the trigger safety.
3. Remove the air head, union nut and nozzle guard.
4. Treat the nozzle with cleaning agent until all paint residues are dissolved. If the nozzle is stubbornly dirty, leave it in the cleaning agent for a longer period of time.
5. Reassemble the air head, nozzle and union nut.

## 6. Possible bug fixes

Problem	Cause	Solution
<b>Material output too low</b>	Nozzle too small	Select larger nozzle → Chapter 8.1
	Material pressure too low	Increase material pressure.
	Filter on pump or gun clogged	Cleaning or replacing the filter.
	Nozzle clogged	Cleaning the nozzle.
	Material supply set too low	Adjust or replace the O-ring.
<b>Poor spray pattern</b>	Incorrectly adjusted atomiser air	Readjust the atomising air.
	Nozzle dirty	Clean the nozzle.
	Wrong aircap	Replace aircap → Chapter 8.2
	Air cap damaged or blocked	Clean or replace air cap.
	Unfavourable nozzle size	Select another nozzle.
	Material pressure too high/ too low	Adjust material pressure.
	Viscosity of the material too high	Dilute according to material manufacturer's instructions.
Nozzle is defective	Insert new nozzle.	
<b>Leaking valve stem</b>	Valve stem seal damaged	Replace seals or needle bar.
	Missing preload	Tighten the sealing screw.
	Leaking air valve seal	Replace gasket.
<b>Spray gun does not close cleanly</b>	Nozzle nut tightened too little	Tighten the nozzle nut.
	Nozzle or needle are damaged	Replace nozzle or needle.
<b>Too much paint mist</b>	Additional air too high	Reduction of air pressure.

## 7. Repairs and maintenance

The M2 spray gun must be cleaned daily. Never immerse the spray gun in cleaning agent.

### 7.1. Repair personnel

All repair work must be carried out by qualified and instructed personnel. There may be hazards from inhalation of solvent vapours during repair work.

A competent person must ensure that the unit is checked for safe condition after completion of the repair. A functional check must be carried out afterwards.

### 7.2. Repair instructions

#### **Improper maintenance/repair!**

Danger to life and damage to equipment.

Only use original beschichtpunkt GmbH spare parts and accessories.

Only repair and replace parts listed as "spare parts" and assigned to the unit and are assigned to the unit.

Never damage the air cap, nozzle or needle. Do not use metal objects to clean the holes on the air cap or the nozzle. These objects with the beschicht. Cleaning Kit Set (ZCLE000). Clean these items with the beschicht. Cleaning Kit Set (ZCLE0002) and a common solvent. These parts must be dry before assembling the spray gun.

## Before repair / maintenance

1. Rinse and clean the system.
2. Relieve the pressure on the material supply and on the spray gun.
3. Lassen Sie den Druck an der Materialzufuhr und an der Spritzpistole ab.

## After the repair

1. Carry out safety checks.
2. Commission the system and check for leaks.
3. A competent person have to check the safe condition of the system.
4. Function check.

### 7.3. Change the needle seal

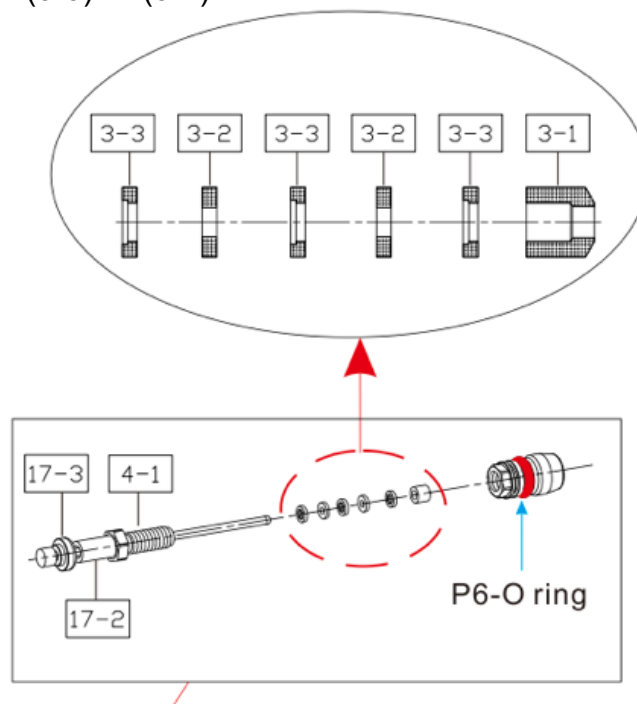
The needle seal is included in the following two spare parts sets:

- Z M2 Needle set Airless Plus (ZM2APN01)
- Z M2 spare part set Airless Plus (ZM2APS01)

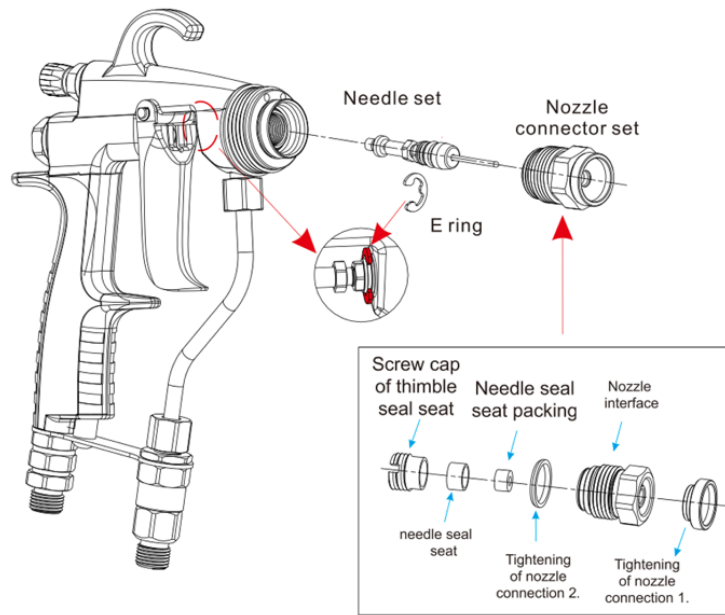
1. Rinse and clean the spray gun.
2. Depressurise the material pressure generator and spray gun.
3. Trigger safety lock
4. Use the original beschicht. Needle set (ZM2ACH47)

Assemble the needle set as follows:

- 4.1. Place the P6 O-ring on the thread of the needle packing.
- 4.2. Set the parts in the following order (17-3) → (17-2) → (4-1) → (3-3) → (3-2) → (3-3) → (3-2) → (3-3) → (3-1).



3. Assemble the needle set into the gun head and fix it with the E-ring.

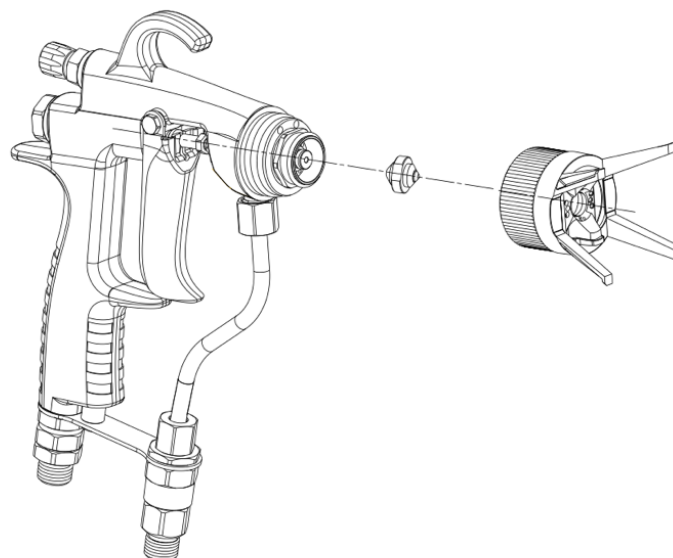


**7.4. Assembly needle connection set**

Press the needle seal seat packing into the inner opening of the needle seal seat and insert it into the screw cap. Turn it into the needle joint set. Tighten the inserted needle joint set with the spanner.

**7.5. Assembly of air cap with nozzle guard**

Insert the nozzle seal, the nozzle and the air cap into the union nut with nozzle protection and carefully screw them tight. Align the air cap and the nozzle horizontally. Carry out a function test.



## 7.6. Assembly / maintenance of shaped air and air valve

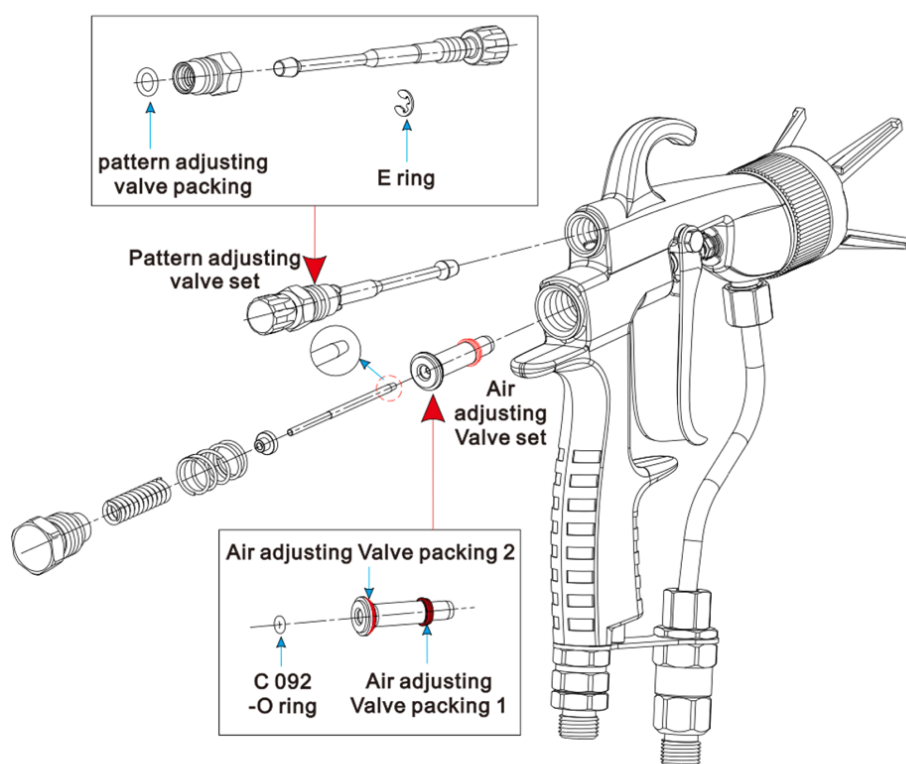
Use the beschicht. spare parts set (ZM2APS01) for maintenance of the moulded air and the air valve.

### 7.6.1. Shaped air

Unscrew the shaped air rod and take out the old valve packing and E-ring and replace them with the new parts from the spare parts kit, as illustrated in the diagram below. Then carefully screw this back in and carefully adjust the ratio of shaped air to atomiser air again before the next use.

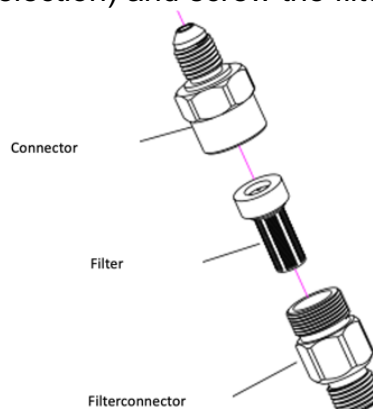
### 7.6.2. Air valve

Carefully unscrew the air valve rod with the enclosed spanner. Replace the O-rings enclosed in the spare parts set on the air valve set accordingly. Then reassemble it as described in the following diagram and tighten it with the spanner.



## 7.7. Change filter

Unscrew the filter connector from the connecting piece and remove the filter. Replace the filter accordingly (chapter 8.1 Filter selection) and screw the filter connector back on. Tighten it with the enclosed spanner



## 8. Spare parts and accessories

### 8.1. Nozzles and filter selection:

size	spray angle			material filter		materialflow** l/min
	20°	30°	40°			
09	09.20	09.30	09.40	200	150	0,26
11	11.20	11.30	11.40			100
13	13.20	13.30	13.40			0,55
15	15.20	15.30	15.40			0,75

100    145    190
spray jet width mm*

\* Tested with 110 bar, 30 cm distance and paint 56 DIN-4s

\*\* tested with water and 100 bar pressure

The nozzles are selected according to the application:

Application	Suitable nozzle size
Natural lacquers, oils, colourless lacquers	09
2K lacquers, PVC lacquers, synthetic resin lacquers	11
Fillers, base coats, undercoats, lacquers	13
Filler, anti-rust paints	15

### 8.2. Selection of the air cap:

Article number	Description	Application
ZM2APL47	Z M2 Aircap L Airless Plus (red)	Low viscosity materials
ZM2APH47	Z M2 Aircap H Airless Plus (blue)	High viscosity materials

### 8.3. Spare parts list M2

Pos	Description	Art. No.
1	Z M2 Aircap L Airless Plus (red)	ZM2APL47
2	Z M2 Aircap H Airless Plus (blue)	ZM2APH47
3	Z M2 Needle set Airless Plus	ZM2APN01
4	Z M2 Spare part Airless Plus	ZM2APS01
5	Z M2 Filter Airless Plus 60 mesh	ZM2AP060
6	Z M2 Filter Airless Plus 100 mesh	ZM2AP100
7	Z M2 Filter Airless Plus 150 mesh	ZM2AP150
8	Z M2 Filter Airless Plus 200 mesh	ZM2AP200
9	Z M2 nozzle Airless Plus 11/40	ZM201140
10	Z M2 nozzle Airless Plus 13/40	ZM201340
11	Z M2 nozzle Airless Plus 13/20	ZM201320
12	Z M2 nozzle Airless Plus 11/30	ZM201130
13	Z M2 nozzle Airless Plus 13/30	ZM201330
14	Z M2 nozzle Airless Plus 9/40	ZM200940
15	Z M2 nozzle Airless Plus 9/20	ZM200920
16	Z M2 nozzle Airless Plus 15/40	ZM201540
17	Z M2 nozzle Airless Plus 09/30	ZM200930
18	Z Clean Nozzle Cleaning agent	ZCLE0001
19	Z Cleaning Kit (brush set)	ZCLE0002

### 8.4. High pressure hoses

Pos	Description	Art. No.
1	Z - Airless Plus Hose set DN3, 270, 1/4"NPS, 7,5m	ZAPH3075
2	Z - Airless Plus Hose set DN4, 270, 1/4"NPS, 7,5m	ZAPH4075
3	Z - Airless Plus Hose set DN4, 270, 1/4"NPS, 15m	ZAPH4150

You can find the parts listed above and also other items in our online store [www.beschicht.com](http://www.beschicht.com)





## 9. 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 by the use of 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.

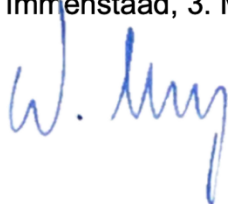
If you use our products in a country in which an operating manual in the national language is required and this is not yet available from beschichtpunkt GmbH, please contact us before use.

## 10. EG/EU – 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.

<b>Manufacturer</b>	<b>beschicht.</b> beschichtpunkt GmbH Graf-von-Soden-Straße 88090 Immenstaad am Bodensee
<b>Part Number</b>	M2AP2500L; M2AP2500H;
<b>Applied Standards and Guidelines</b>	
EG-Maschinenrichtlinien 2006/42/EG DIN EN ISO 12100 DIN EN 1953	
<b>Specification within the meaning of Directive 2014/34/EU</b>	
  II 2 G X	
<b>Authorized with the compilation of technical documentation</b> Wolfgang Merz beschichtpunkt GmbH, Graf-von-Soden-Straße, 88090 Immenstaad am Bodensee	
<b>Special notes:</b> X: The max. surface temperature corresponds to the permissible material temperature. This is specified in the technical data chapter.  The product is intended for incorporation into another device. Commissioning is prohibited until the conformity of the final product with Directive 2006/42/EC has been established.	

Immenstaad, 3. Mai 2021 Wolfgang Merz  
(Managing Director)



**beschicht.**

**beschichtpunkt GmbH**  
Graf-von-Soden-Straße  
88090 Immenstaad am Bodensee