

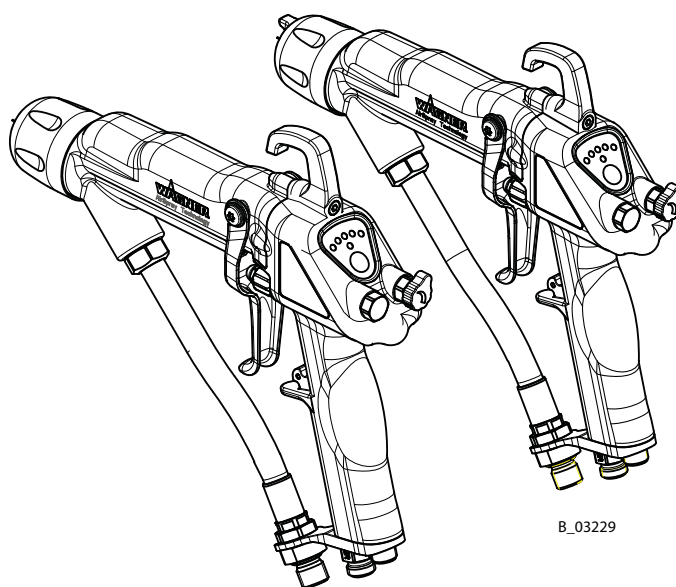


Translation of the original
Operating manual

GM 5000EA

Edition 03/2012

Electrostatic Airspray gun
for manual operation
with flat or round jet nozzles



CE₀₁₀₂ Ex II 2 G EEx 0.24 mJ



(in submission)

B_03229

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1 ABOUT THESE INSTRUCTIONS

This operating manual contains information about the operation, repair and maintenance of the unit.

→ Always follow these instructions when operating the unit.

This equipment can be dangerous if it is not operated in accordance with this manual.

Electrostatic spray guns may be operated only by trained personnel.

Compliance with these instructions constitutes an integral component of the guarantee agreement.

1.1 LANGUAGES

This operating manual is available in the following languages:



Language:	Part No.	Language:	Part No.
German	2310480	English	2319149
French	2320149	Dutch	-
Italian	2320150	Spanish	2320151

1.2 WARNINGS, NOTES AND SYMBOLS IN THESE INSTRUCTIONS



Warning instructions in this manual point out particular dangers to users and equipment and state measures for avoiding the hazard.

These warning instructions fall into the following categories:



Danger - imminent danger. Non-observance will result in death, serious injury and serious material damage.

 SIHI_0100_GB	 DANGER
	<p>This line warns of the hazard! Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

Warning - possible danger. Non-observance can result in death, serious injury and serious material damage.

 SIHI_0103_GB	 WARNING
	<p>This line warns of the hazard! Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

Caution - a possibly hazardous situation. Non-observance can result in minor injury.

 SIHI_0101_GB	 CAUTION
	<p>This line warns of the hazard! Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

Caution - a possibly hazardous situation. Non-observance can cause material damage.

 SIHI_0102_GB	CAUTION
	<p>This line warns of the hazard! Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

Note - provide information on particular characteristics and how to proceed.

2 GENERAL SAFETY INSTRUCTIONS

2.1 SAFETY INSTRUCTIONS FOR THE OPERATOR

- Keep these operating instructions to hand near the unit at all times.
- Always follow local regulations concerning occupational safety and accident prevention.



2.1.1 ELECTRICAL EQUIPMENT

Electrical plant and unit

- To be provided in accordance with the local safety requirements with regard to the operating mode and ambient influences.
- May only be maintained by skilled electricians or under their supervision.
- Must be operated in accordance with the safety regulations and electrotechnical regulations.
- Must be repaired immediately in the event of problems.
- Must be put out of operation if they pose a hazard.
- Must be de-energized before work is commenced on active parts. Inform staff about planned work, observe electrical safety regulations.

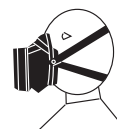


2.1.2 PERSONNEL QUALIFICATIONS

- Ensure that the unit is operated and repaired only by trained persons.

2.1.3 A SAFE WORK ENVIRONMENT

- Make sure that the floor in the area where you are working is anti-static in accordance with EN 61340-4-1 (the resistance value may not exceed 100 MOhm).
- Ensure that all persons within the working area wear antistatic shoes. Footwear must comply with EN 20344. The measured insulation resistance may not exceed 100 MOhm.
- Ensure that during spraying, persons wear anti-static gloves so that they are earthed via the handle of the spray gun.
- If protective clothing is worn, including gloves, it has to comply with EN 1149-5. The measured insulation resistance may not exceed 100 MOhm.
- Paint mist extraction systems must be fitted on site according to the local regulations.
- Ensure that the following components of a safe working environment are available:
 - Material/air hoses adapted to the working pressure.
 - Personal safety equipment (breathing and skin protection).
- Ensure that there are no ignition sources such as naked flame, glowing wires or hot surfaces in the vicinity. Do not smoke.



2.2 SAFETY INSTRUCTIONS FOR STAFF

- Always follow the information in these instructions, particularly the general safety instructions and the warning instructions.
- Always follow local regulations concerning occupational safety and accident prevention.



2.2.1 SAFE HANDLING OF WAGNER SPRAY UNITS

The spray jet is under pressure and can cause dangerous injuries.

Avoid injection of paint or cleaning agents:

- Never point the spray gun at people.
- Never reach into the spray jet.
- Before all work on the unit, in the event of work interruptions and functional faults:
 - Switch off the energy/compressed air supply.
 - Secure the spray gun against actuation.
 - Relieve the pressure from the spray gun and unit.
 - By functional faults: Identify and correct the problem, proceed as described in chapter „Trouble shooting“.

In the event of skin injuries caused by paint or cleaning agents:

- Note down the paint or cleaning agent that you have been using.
- Consult a doctor immediately.

Avoid danger of injury through recoil forces:

- Ensure that you have a firm footing when operating the spray gun.
- Only hold the spray gun briefly in any one position.



2.2.2 EARTH THE UNIT

Depending on the high-voltage of the spray electrode and the flow rate at spray pressures can produce an electrostatic charge in the equipment. These can cause sparks and flames upon discharge.

- Ensure that the unit is always earthed.
- Earth the work pieces to be coated.
- Ensure that all persons inside the working area are earthed, e.g. that they are wearing derivable shoes.
- When spraying, wear derivable gloves to earth yourself via the spray gun handle.



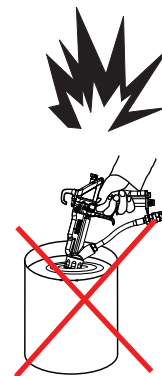
2.2.3 MATERIAL HOSES

- Ensure that the hose material is chemically resistant to the sprayed materials.
- Ensure that the material hose is suitable for the pressure generated in the unit.
- Ensure that the following information is visible on the high pressure hose:
 - Manufacturer
 - Permissible operating overpressure
 - Date of manufacture.
- The electrical resistance of the complete high pressure hose must be less than 1 MOhm.



2.2.4 CLEANING

- De-energize the unit electrically.
- Disconnect the pneumatic supply line.
- Relieve the pressure from the unit.
- Ensure that the flash point of the cleaning agent is at least 15K above the ambient temperature. Otherwise, the cleaning works shall be carried out at forced ventilated cleaning place.
- To clean, use only solvent-soaked cloths and brushes. The cleaning process mustn't damage parts of the spray gun, it mustn't be an abrasive procedure.
- Parts of spray gun mustn't submerged or soaked into solvent.
- Non-ignitable cleaning liquids shall be preferred.
- A suitable solvent for cleaning the spray gun depends on the part of the gun and on the material that needs to be removed. It's recommended to use only non-polar solvents to prevent a conductive residue on critical components. If it's necessary to use polar solvents to clean the spray gun components, all residue must be removed by using a nonconductive non-polar solvent.
- All electrical components cannot be cleaned or soaked in any solvents. An explosive gas/air mixture forms in closed containers.
- When cleaning units with solvents, never spray into a closed container.
- For cleaning liquids only electrically leading containers may be used.
- The containers must be earthed.



2.2.5 HANDLING HAZARDOUS LIQUIDS, VARNISHES AND PAINTS

- When preparing or working with paint and when cleaning the unit, follow the working instructions of the manufacturer of the paints, solvents and cleaning agents being used.
- Take the specified protective measures, in particular wear safety goggles, protective clothing and gloves, as well as hand protection cream if necessary.
- Use a mask or breathing apparatus if necessary.
- For sufficient health and environmental safety: Operate the unit in a spray booth or on a spraying wall with the ventilation (extraction) switched on.
- Wear suitable protective clothing when working with hot materials.



2.2.6 TOUCHING HOT SURFACES

- Touch hot surfaces only if you are wearing protective gloves.
- When operating the unit with a coating material with a temperature of > 43 °C; 109.4 °F:
 - Identify the unit with a warning label that says „Warning - hot surface“.

Order No.

9998910 Information label

9998911 Safety label



2.3 CORRECT USE

WAGNER accepts no liability for any damage arising from incorrect use.

- Use the unit only to work with the materials recommended by WAGNER.
- Operate the unit only as an entire unit.
- Do not deactivate safety equipment.
- Use only WAGNER original spare parts and accessories.



2.4 SAFETY-RELEVANT INFORMATION ABOUT DISCHARGES

The plastic parts of the spray gun are charged electrostatically by the high-voltage field of the spray pistol. Harmless discharges (brush discharges) are possible after contact with plastic parts. They are completely harmless for people.

The corona discharge at the electrode end is visible during darkness at a distance of between 4 and 10 mm; 0.15 and 0.4 inches, between the spray gun and spray object.

2.5 USE IN AN EXPLOSION HAZARD AREA

In hazardous locations only approved explosion-proof electrical equipment is used.

2.5.1 CORRECT USE

The GM 5000EA electrostatic hand spray gun is suitable for spraying liquid materials, particularly coating materials, using the air atomizing method. Coating materials containing solvents of Explosion Class II A may be used. The spray gun may only be used in combination with the VM 500 and VM 5000 control unit.

2.5.2 EXPLOSION PROTECTION IDENTIFICATION CE

As defined in the Directive 94/9/EC (ATEX), the unit is suitable for use in areas where there is an explosion hazard.

CE₀₁₀₂ II 2G EEx 0.24mJ X
SIRA 11 ATEX 5374X



CE	Communautés Européennes	E	European Standard
0102	Notified body: PTB	Ex	Explosion protected
Ex	Symbol for explosion protection	0.24mJ	Max. firing power
II	Unit class II	SIRA 11	Number of the type examination certificate
2	Category 2 (Zone 1)	ATEX 5374X	
G	Ex-atmosphere gas		

2.5.2.1 IDENTIFICATION „X“

Max. surface temperature

- Maximum surface temperature: 85 °C; 185 °F
- Maxi. Permissible material temperature: 50 °C; 122 °F
- Permissible ambient temperature: +0 to +40 °C; +32 to +104 °F

Safety instructions

Safe handling of WAGNER spray units

Mechanical sparks can form if the unit comes into contact with metal.

In an explosive atmosphere:

- Do not knock or push the unit against steel or rusty iron.
- Do not drop the gun.
- Use only tools that are made of a permitted material.

Ignition temperature of the coating material

- Ensure that the ignition temperature of the coating material is above the maximum surface temperature.

Surface spraying, electrostatic

- Do not spray unit parts with electrostatic (e.g. electrostatic spray gun).



Medium supporting atomizing

- To atomize the material, use only weakly oxidizing gases, e.g. air.

Cleaning

If there are deposits on the surfaces, the unit may form electrostatic charges. Flames or sparks can form if there is a discharge.

- Remove deposits from the surfaces to maintain conductivity.
- Use only a damp cloth to clean the unit.



2.5.3 EXPLOSION PROTECTION IDENTIFICATION FM



For Electrostatic Finishing Applications
using Class I, Group D, Spray Material

In accordance with 2316160

(the device is in submission)

This device has been manufactured and tested according to the FM (Factory Mutual) standard „Class Number 7260“ (Approval Standard for Electrostatic Finishing Equipment) by FM. All tested combinations of devices including accessories are given in the FM Control Document with part number 2316160.

2.6 GERMAN REGULATIONS AND GUIDELINES

- a) BGV A3 Electrical units and equipment
- b) BGR 500 Part 2, Chap. 2.36 Working with liquid ejection devices
- c) BGR 500 Part 2, Chap. 2.29 Using coating materials
- d) BGR 104 Explosion protection rules
- e) TRBS 2153 Avoiding ignition risks
- f) BGR 180 Setting up for cleaning with solvents for cleaning workpieces with solvents
- g) ZH 1/406 Guidelines for liquid ejection devices
- h) BGI 740 Painting rooms and equipment
- j) BGI 764 Electrostatic coating
- j) Betr.Sich.V. Plant Safety Ordinance

Note: All titles can be ordered from Heymanns Publishing House in Cologne, or they are to be found in the Internet.

3 GUARANTEE AND CONFORMITY DECLARATIONS

3.1 IMPORTANT NOTES ON PRODUCT LIABILITY

As a result of an EC regulation, effective as from January 1, 1990, the manufacturer shall only be liable for his product if all parts come from him or are approved by him, and if the devices are properly fitted, operated and maintained.

If other makes of accessory and spare parts are used, the manufacturer's liability could be fully or partially null and void.

The usage of original WAGNER accessories and spare parts guarantees that all safety regulations are observed.

3.2 GUARANTEE CLAIM

Full guarantee is provided for this device:

We will at our discretion repair or replace free of charge all parts which within 24 months in single-shift, 12 months in 2-shift or 6 months in 3-shift operation from date of receipt by the Purchaser are found to be wholly or substantially unusable due to causes prior to the sale, in particular faulty design, defective materials or poor workmanship.

The type of guarantee provided is such that the device or individual components of the device are either replaced or repaired as we think fit. The resulting costs, in particular shipping charges, road tolls, labour and material costs will be borne by us except where these costs are increased due to the subsequent shipment of the unit to a location other than the address of the purchaser.

We do not provide guarantee for damage that has been caused or contributed to for the following reasons:

Unsuitable or improper use, faulty installation or commissioning by the purchaser or a third party, normal wear, negligent handling, defective maintenance, unsuitable coating products, substitute materials and the action of chemical, electro chemical or electrical agents, except when the damage is attributable to us.

Abrasive coating products such as red lead, emulsions, glazes, liquid abrasives, zinc dust paints and similar reduce the service life of valves, packings, spray guns, tips, cylinders, pistons etc. Signs of wear and tear due to such causes are not covered by this guarantee.

Components that have not been manufactured by WAGNER are subject to the original guarantee of the manufacturer.

Replacement of a component does not extend the period of guarantee of the device.

The unit should be inspected immediately upon receipt. To avoid losing the guarantee, we or the supplier company are to be informed in writing about obvious faults within 14 days upon receipt of the device.

We reserve the right to have the guarantee compliance met by a contracting company.

The services provided by this guarantee depend on evidence being provided in the form of an invoice or delivery note. If an examination discovers that no guarantee claim exists, the costs of repairs are charged to the purchaser.

It is clearly stipulated that this guarantee claim does not represent any constraint to statutory regulations or regulations agreed contractually in our general terms and conditions.

J. Wagner AG

3.3 CE-CONFORMITY

EC declaration of conformity as defined by Atex-directive 94/9/EC.

Herewith we declare that the supplied version of

Electrostatic hand spraying system			
VM 500	VM 5000	GM 5000EA	GM5000EAC

Complies with the following guidelines:

94/9/EG	2004/108/EG	2002/96/EG
2006/42/EG	2002/95/EG	

Applied standards, in particular:

DIN EN 50050:2007	DIN EN 61000-6-2:2006	DIN EN ISO 12100:2011
DIN EN 1953:2010	DIN EN 61000-6-4:2011	DIN EN 60079-0:2010
DIN EN 60079-15:2011	DIN EN 60204-1:2007	

Applied national technical standards and specifications, in particular:

BGI 764

EC type examination certificate:

SIRA 11 ATEX 5374X issued by SIRA Certification, CH4 9JN, Chester, England, notified body no. 0518

Identification:

Control unit: CE_{0102} Ex II (2) G
SIRA 11 ATEX 5374X

CE_{0102} Ex II 3 G Ex nR IIC T4 Gc

Spray gun: CE_{0102} Ex II 2 G EEx 0.24mJ
SIRA 11 ATEX 5374X

CE Certificate of Conformity

The certificate is enclosed with this product. The certificate of conformity can be reordered from your WAGNER representative, quoting the product and serial number.

Part number:

2310487

4 DESCRIPTION

4.1 FIELDS OF APPLICATION, USING IN ACCORDANCE WITH THE INSTRUCTIONS

The electrostatic spray gun can only be used with the VM 5000 or VM 500 control units.

4.1.1 PROCESSABLE MATERIALS

- With the GM 5000EA gun, paints can be applied which contain solvent of explosion class II A.
- The spray gun basic version is suitable for processing of sprayed substances with an electrical resistance of $> 150 \text{ k}\Omega$ (according to the WAGNER scale). Equipped with a special material hose for low impedance sprayed substances (available as accessory) you can also sprayed substances with an electrical conductivity $> 50 \text{ k}\Omega$ (according to the WAGNER scale) process successfully.
- The application effectiveness is always dependant on the composition of the paint being used, e.g. pigments or resin.

Conversion of the resistance of paint

There are paint resistance measuring devices on the market that do not measure directly the specific resistance of paint. Multiplying the result of measurement with the device-specific cell constant (K), we obtain the resistivity value of the material.

Example:

The Wagner paint resistance measuring device is the cell constant $K = 123$.

Measured value according to the WAGNER scale $R = 500 \text{ k}\Omega$

Specific resistance (R_s) $R_s = R \times K = 500 \text{ k}\Omega \times 123 = 61.5 \text{ M}\Omega \cdot \text{cm}$

Note:

With sprayed substances and those with too low electrical resistance the electrostatic effect will not have any effect, i.e., there will be no „wrap around“ noticeable at the spray object. The relationship between the values of the high-voltage (kV) and the current (μA), shown on the VM 5000 control unit and/or on the spray gun, denotes the charging capacity of a spray material.

High kV value, low μA value = ok

Low kV-value, high μA -value = Excessive conductivity of the paint -> no wrap-around

In the event of application problems, contact your WAGNER branch and the paint manufacturer.

4.2 SCOPE OF DELIVERY

Quantity	Part No.	Description
1	2309870	GM 500EA spray gun Without control unit, material and air hose, electrical cable, air cap and nozzle.

Each gun includes as standard equipment:

	Part No.	Description
1	2309368	Assembly tool valve needle
1	2325263	Assembly tool clamping screw
1	2319653	Glove against ink mist precipitation
1	2310487	CE-Conformity
-	2310480	Operating manual German
1	see 1.1	Operating manual in the local language

The spray gun basic version can be set according to requirement and the desired accessories with the help of the spray gun configuration.

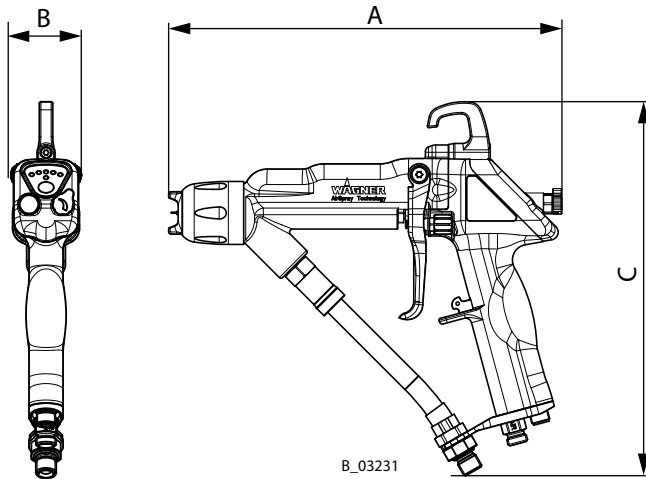
The delivery note shows the exact scope of delivery.

4.3 TECHNICAL DATA

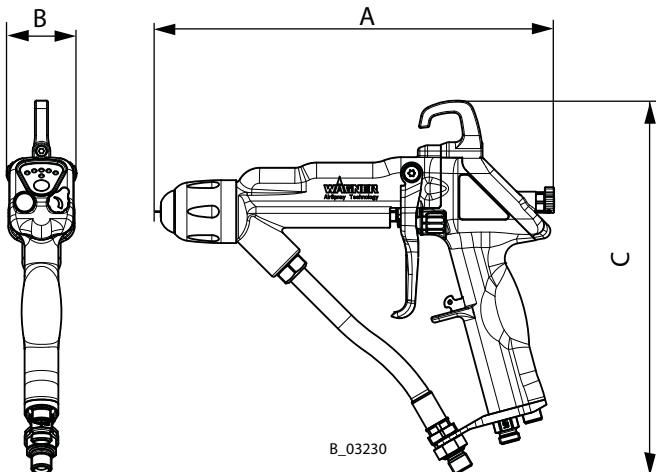
Max. air pressure	0.8 MPa; 8 bar; 116 psi
Max. material pressure	0.8 MPa; 8 bar; 116 psi
Paint connection	G 1/4" A
Air connection	G 1/4" A
Input voltage	max. 20 Vpp
Input current	max. 1.0 A AC
Output voltage	max. 80 kV DC
Output current	max. 100 µA DC
Polarity	negative
Weight (without hose set)	630 g (incl. union nut, nozzle and air cap)
Working temperature range	0 °C to 40 °C; 32 °F to 104 °F
Material temperature	50 °C; 122 °F
Sound level at 0.3 MPa; 3 bar; 43.5 psi air pressure and 0.3 MPa; 3 bar; 43.5 psi material pressure	78 dB(A) *

* A rated sound pressure level measured at 1 m distance according to DIN EN 14462: 2005.

Measurements



GM 500EA F with flat jet nozzle		
	mm	inches
A	261	10.28
B	46	1.81
C	245	9.65



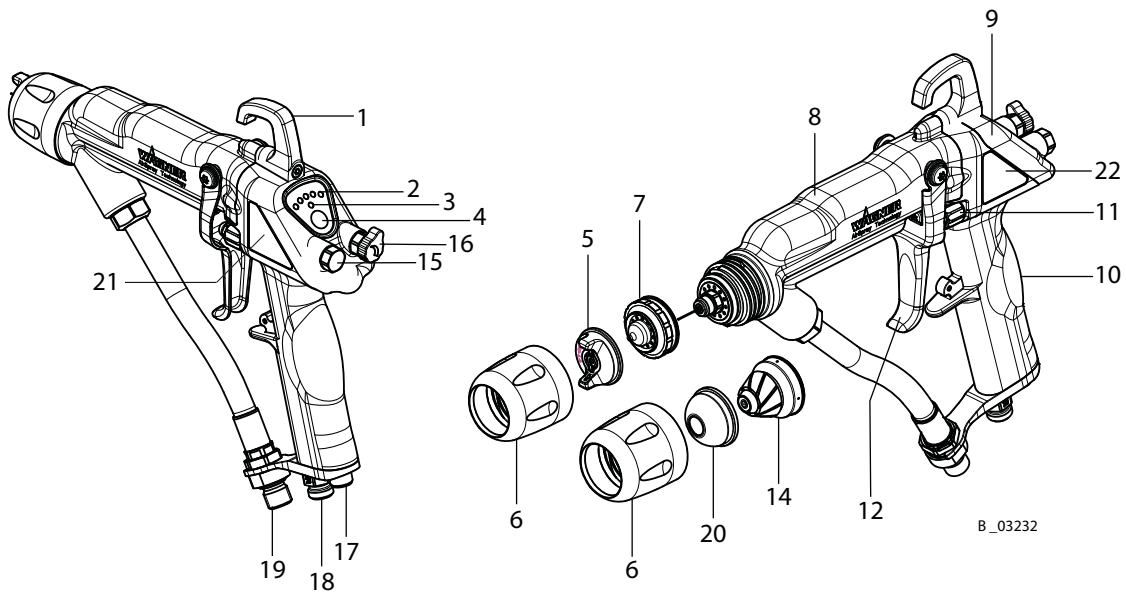
GM 500EA R with round jet nozzle		
	mm	inches
A	261	10.28
B	46	1.81
C	245	9.65

4.4 FUNCTIONAL DESCRIPTION

4.4.1 DESIGN OF SPRAY GUN (STANDARD VARIANT)

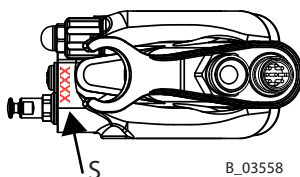
Note:

The nozzle parts (item 5; 7; 14 and 20) do not belong to the basic equipment of the spray gun. The different versions can be found in Chapter 9, „Accessories“.



Item	Description
1	Suspension hook
2	Display (spray current and recipe)
3	Display (standby and fault)
4	Operating button (standby and recipe change)
5	Air cap Air (Accessories, chapter 9)
6	Union nut
7	Fan spray nozzle AF 5000 x.x (Accessories, chapter 9)
8	End-piece
9	Cover

Item	Description
10	Handle
11	Adjusting screw (stop)
12	Trigger
14	Nozzle AR 5000 (Accessories, chapter 9)
15	Lock plug
16	Air adjustment
17	Electrical cable connection
18	Atomizing air connection
19	Material connection
20	Air cap AR 5000 (Accessories, chapter 9)
21	Type plate left
22	Type plate right



Note:

The gun type (T) on the type plate (21) and the serial number (S) on the underside of the handle.

4.4.2 FUNCTIONS OF THE SPRAY GUN

When the spray gun is connected to the control unit and the control unit is switched on, the pre-defined recipe (R1, R2 or R3) is shown on the gun display (2) as follows.

Recipe 1 -> ●○○○○ R1

Recipe 2 -> ●●●○○ R2

Recipe 3 -> ●●●●● R3

Recipe change R1 -> R2 -> R3 -> R1

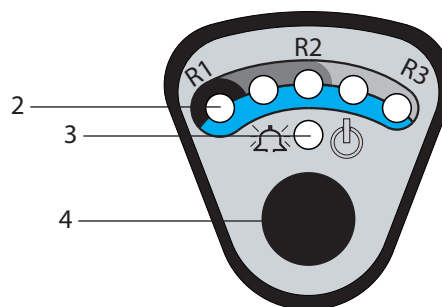
Press the operating button (4) and hold the button pressed of at least 2 seconds, then it is advanced by 1 recipe.

Display (2) -> ●●○○○ = recipe values changed temporarily:
The stored recipe values of the previously selected recipe number are re-loaded from memory by pressing the operating button (4) for 2 seconds.

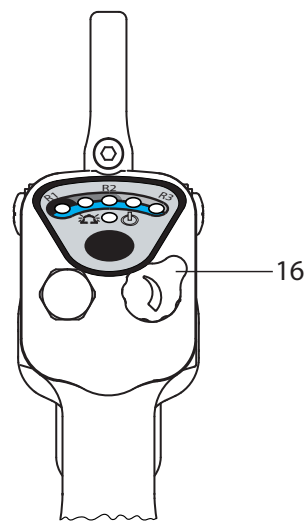
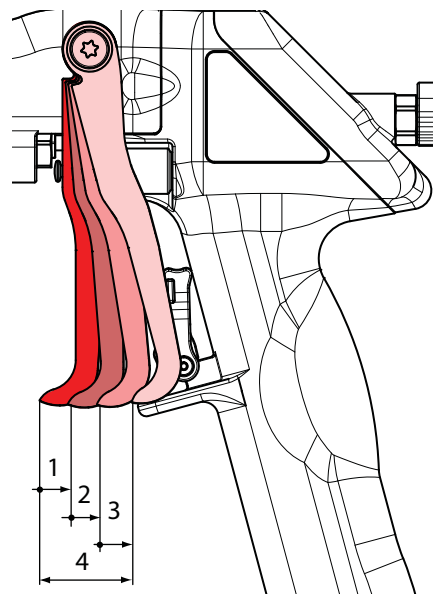
The trigger can be used to activate, one after the other, the various functions of the spray gun.

Distance	Description
1	Atomizing air open.
2	Atomizing air open and electrostatically (HV) activated. -> Display (2) for „spray current“ on the spray gun ●○○○○ to ●●●●● activated.
3	Atomizing air open, electrostatically (HV) activated and material valve open.
4	Max way of trigger.

- An increase in the tension needed to pull the trigger back will be felt at the position where the material valve opens.
- For spraying without high-voltage, the high-voltage can be switched off using the operating button (4). Press the operating button (4) briefly: High-voltage is switched off. The standby display (3) illuminates.
- In the event of a malfunction the spray gun switches to „standby“ operating mode and the display (3) illuminates.
- The width of the spray jet can be adjusted using the air adjustment (16) (only for flat-jet method).



B_03182

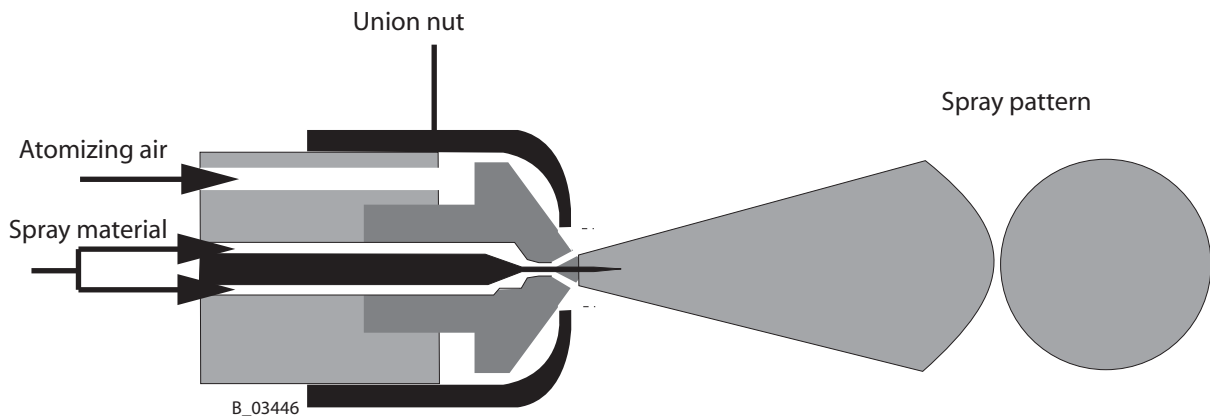


B_03183

4.5 SPRAYING PROCESS

4.5.1 AIR ATOMIZING SPRAY PROCESS - ROUND JET

In this process, the material (paint) is fed to the nozzle with low pressure (0.05-0.2 MPa; 0.5-2 bar; 7-29 psi). The atomizing air at approx. 0.25-0.4 MPa; 2.5-4 bar; 36-58 psi produces a soft jet, which largely eliminates the problem of overlapping boundaries. There are various nozzles and air caps available as accessories for the respective spraying material and the output amounts.

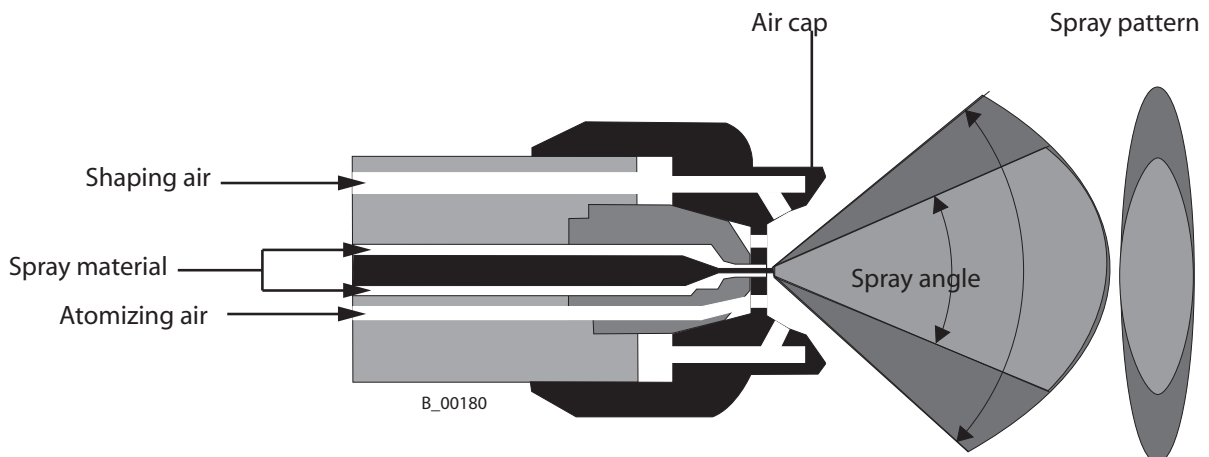


Advantages

- Low coating thickness
- Uniform coating thickness
- Perfect finish

4.5.2 AIR ATOMIZING SPRAY PROCESS - FLAT JET

In this process, the material (paint) is fed to the nozzle with low pressure (0.05-0.2 MPa; 0.5-2 bar; 7-29 psi). The atomizing air at approx. 0.25-0.4 MPa; 2.5-4 bar; 36-58 psi produces a soft jet, which largely eliminates the problem of overlapping boundaries. The spray jet can be changed using the shaping air. There are various nozzles and air caps available as accessories for the respective spraying material and the output amounts.

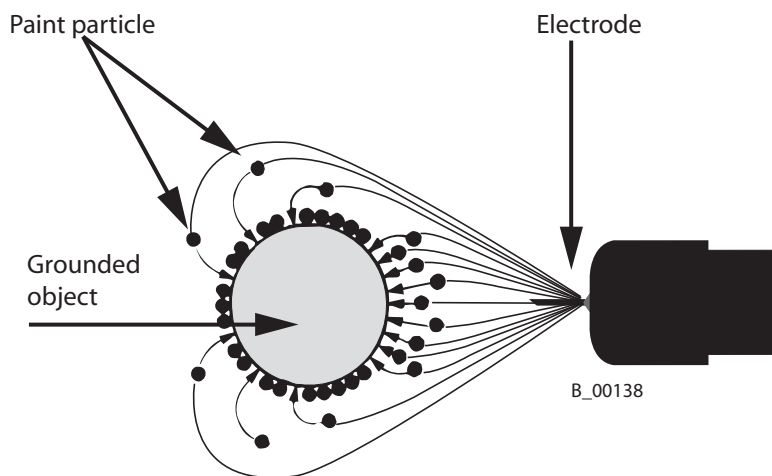


Advantages

- Large range of adjustment of the jet spray
- Low coating thickness
- Uniform coating thickness
- Perfect finish

4.5.3 THE ELECTROSTATIC EFFECT

The spray gun produces an electrostatic field by means of the high-voltage electrode. As a result, the particles of paint, which have been atomized by the spray gun, are carried to the earthed object by kinetic and electrostatic energy where they adhere, finely distributed, to the object being sprayed.



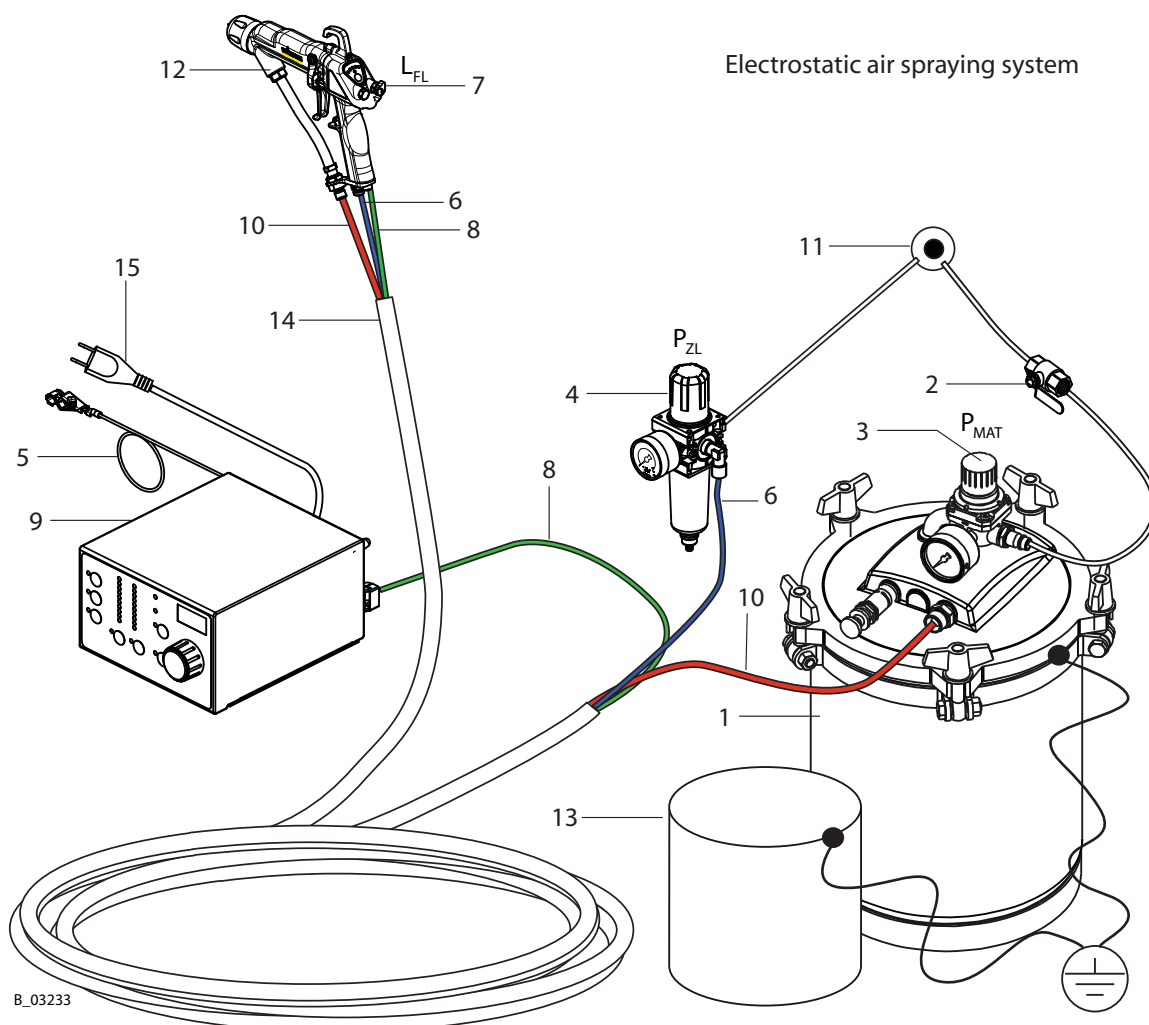
Advantages

- Very efficient spraying
- Little over spray
- Coating of entire circumferences due to an electrostatic field
- Less working time

5 START-UP AND OPERATION

5.1 INSTALLATION AND CONNECTION

5.1.1 TYPICAL ELECTROSTATIC AIR SPRAYING SYSTEM





B_03233

Item	Description
1	Pressure tank
2	Stop valve
3	Air pressure regulator tank
4	Air pressure regulator with air filter
5	Earthing cable
6	Air hose
7	Air adjustment
8	Gun cable

Item	Description
9	VM 5000 control unit
10	Material hose
11	Compressed air main
12	GM 500EAR spray gun
13	Container for return flow
14	Protective hose
15	Mains cable

The GM 500EA spray gun must be used a part of an electrostatic spraying system (spray-pack). The spraying system shown in the figure B_03233 is only one example of an electrostatic air spraying system. Contact your Wagner distributor for assistance in designing a system to meet your needs. The operating instructions and the safety regulations for the additional system components used must be read before starting-up.

	 WARNING
	<p>Incorrect installation/operation! Risk of injury and damage to equipment</p> <p>→ When putting into operation and for all work, read and follow the operating instructions and safety regulations for the additionally required system components.</p>



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5.1.2 VENTILATION OF THE SPRAY BOOTH

The electrostatic hand spraying equipment is for use only in spray areas which correspond with standard EN 12215.

The electrostatic hand spraying equipment has to be locked to the technical ventilation so that the coating material supply and the high-voltage are not effective as long as the technical ventilation is not operated with the minimum exhaust air volume flow or a larger exhaust air volume flow.

Ensure that the excess coating material (overspray) will be collected up safely.

	 WARNING
	<p>Toxic and/or flammable vapor mixtures! Risk of poisoning and burns</p> <p>→ Operate the unit in a spraying booth approved for the working materials. -or- → Operate the unit on an appropriate spraying wall with the ventilation (extraction) switched on. → Observe national and local regulations for the outgoing air speed.</p>

SIHI_0028_GB

5.1.3 AIR SUPPLIES

The use of an air filter with the air regulator (4) ensures that only dry, clean atomizing air gets into the spray gun. Dirt and moisture in the atomizing air reduce the spraying quality and the appearance of the finished piece.

5.1.4 PAINT SUPPLIES

CAUTION

Impurities in the spraying system!

Spray gun blockage, materials harden in the spraying system

→ Flush the spray gun and paint supply with a suitable cleaning agent.

SIHI_0001_GB



DANGER

Bursting hose, bursting threaded joints!

Danger to life from injection of material



- Ensure that the hose material is chemically resistant.
- Ensure that the spray gun, threaded joints and material hose between the unit and the spray gun is suitable for the pressure generated in the unit.
- Ensure that the following information can be seen on the high pressure hose:
 - Manufacturer
 - Permissible operating pressure
 - Date of manufacture.

SIHI_0029_GB



5.1.5 EARTHING

Perfect earthing of all conductive parts such as floors, walls, roofs, is important for optimum coating and safety. Barriers, work pieces, transport devices, coating material container, automatic movement system or construction parts in the spray area must be connected to the earthing system, with exception of the high-voltage parts during normal operation.

Part of the booth must be grounded in accordance with EN 12215.

	 WARNING
	<p>Discharge of electrostatically charged components in atmospheres containing solvents! Explosion hazard from electrostatic sparks or flames</p> <p>→ Earth all unit components. → Earth the workpieces being painted.</p>

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	 WARNING
	<p>Heavy paint mist if earthing is insufficient! Risk of poisoning Insufficient paint application quality</p> <p>→ Earth all unit components. → Earth the workpieces being painted.</p>

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The imperfect earthing of a work piece will result in:

- Very poor wrap-around.
- Uneven coating thickness.
- Back spraying to the spray gun, i.e. contamination.

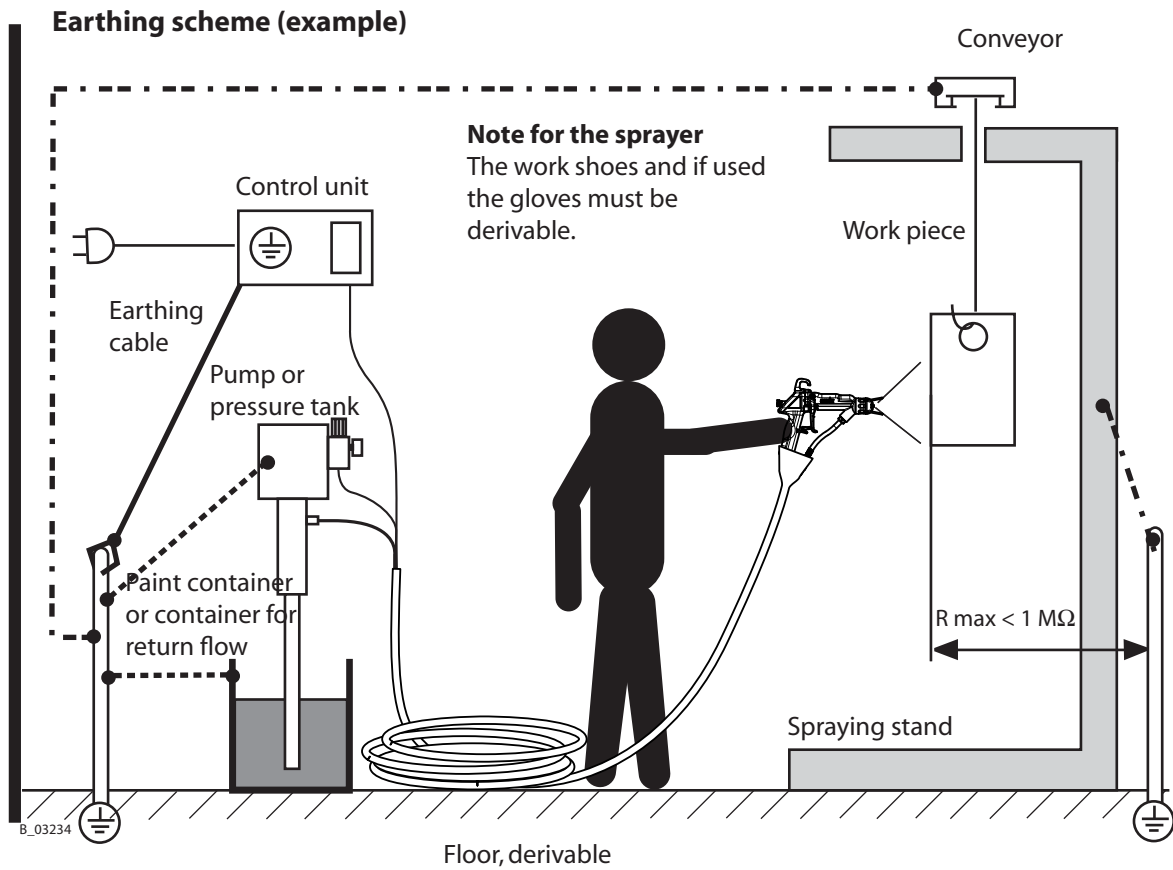
The prerequisites for perfect earthing and coating are:

- Clean work piece suspension.
- Earthing of spray booth, conveyor system and suspension on the building side in accordance with the operating instruction or the manufacturer's information.
- Earthing of all conductive parts within the working area.
- The earthing resistance of the work piece may not exceed 1 MΩ (Mega Ohm).

Note:

Resistance to earth measured at 500 V or 1000 V.

- Connect the control unit to the mains system earth.



Minimum cable cross-section

Control unit	4 mm ² (AWG 12)
Pump	4 mm ² (AWG 12)
Paint container	4 mm ² (AWG 12)
Conveyor	16 mm ² (AWG 6)
Booth	16 mm ² (AWG 6)
Spraying stand	16 mm ² (AWG 6)

5.2 PREPARATION OF PAINTS

The viscosity of the paints is of great importance. The best spraying results are obtained with values between 15 and 30 DIN-s (measured in immersion flow cup DIN 4 mm; 0.16 inches).

In the case of application problems contact the paint producer.

5.2.1 VISCOSITY CONVERSION TABLE

milli Pascal x Sec mPas	Centipoise	Poise	DIN Cup 4 mm ; 0.16 inch	Ford Cup 4	Zahn 2
10	10	0.1		5	16
15	15	0.15		8	17
20	20	0.2		10	18
25	25	0.25	14	12	19
30	30	0.3	15	14	20
40	40	0.4	17	18	22
50	50	0.5	19	22	24
60	60	0.6	21	26	27
70	70	0.7	23	28	30
80	80	0.8	25	31	34
90	90	0.9	28	32	37
100	100	1	30	34	41
120	120	1.2	33	41	49
140	140	1.4	37	45	58
160	160	1.6	43	50	66
180	180	1.8	46	54	74
200	200	2	49	58	82
220	220	2.2	52	62	
240	240	2.4	56	65	
260	260	2.6	62	68	
280	280	2.8	65	70	
300	300	3	70	74	
320	320	3.2			
340	340	3.4			
360	360	3.6	80		
380	380	3.8			
400	400	4	90		

5.3 WAGNER ELECTROSTATIC AIR SPRAYING SYSTEM

The nozzle range (chapter 9), provided by Wagner, allows optimum coating results for each application.

General criteria for selection of nozzles:

Flat jet -> for parts with large surfaces

Round jet -> for small delicate parts

Influences on the jet spray - the spray pattern:

Description		Modification
Material pressure	P_{Mat}	+ or -
Atomizing air pressure	P_{ZL}	+ or -
Air adjustment	L_{FL}	from open to closing
Stop screw material valve	A_{MV}	from open to closing
Nozzle sizes	DS	Material flow volume
Electrostatic	ES	+ or - or off

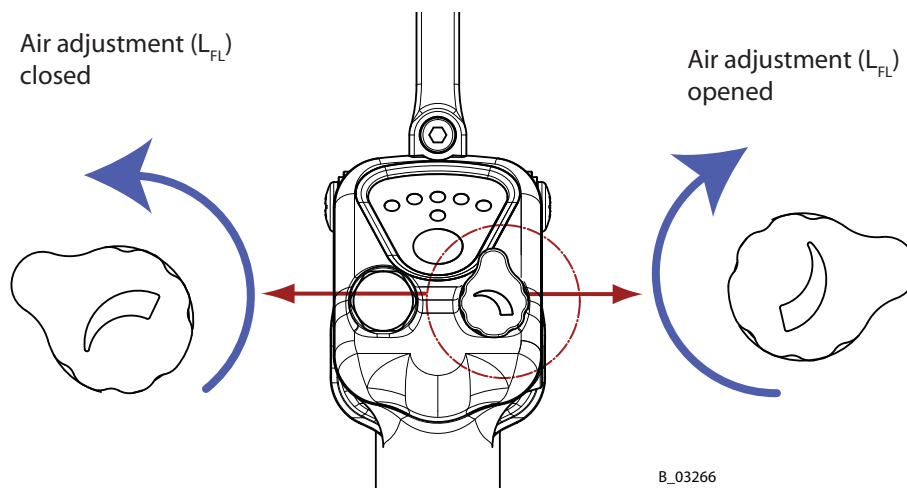
5.3.1 PRESSURE SETTINGS FOR ROUND JET NOZZLES

There are 2 nozzle sizes, D8 and D12 available. The air cap and nozzle are adjusted according to size each other and may not be used reversed. During the calibration of the material pressure (PMAT) and the atomizing air pressure (PZL) the air control lever shown in the figure B_03266 must be in central position.

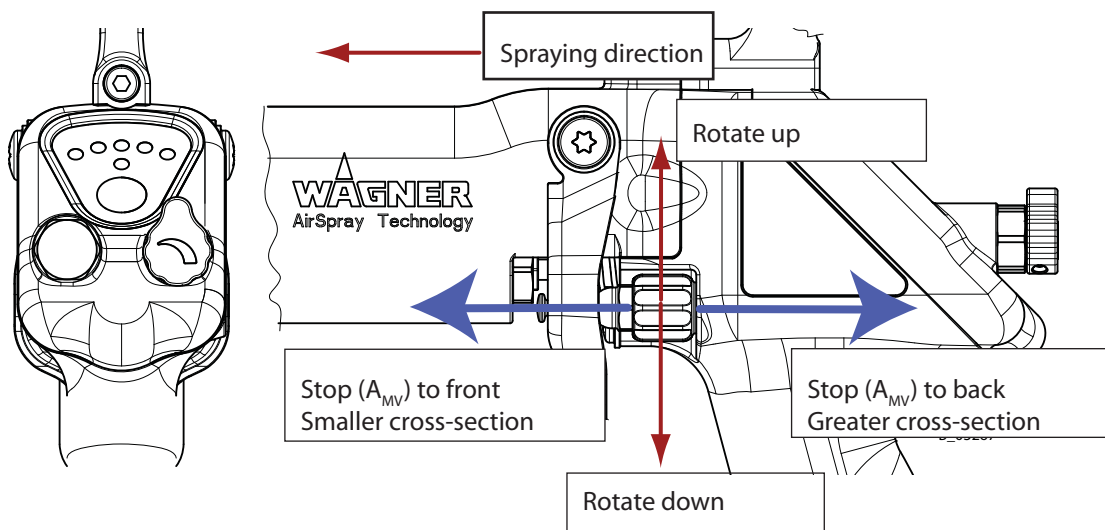
Pressure setting	D8 nozzle (small)	D12 nozzle (large)
Material pressure (P_{MAT})	0.8 bar to 1.2 bar	0.8 bar to 1.6 bar
Atomizing air pressure (P_{ZL})	2.0 bar to 2.3 bar	2.3 bar to 3.0 bar

Note:

In the table, default values are included. Depending on the material, conditions and the desired result different values are possible or necessary.



By turning the adjusting screw (A_{MV}) side of the gun, the outlet cross-section can be adjusted on the material valve. By reducing of this cross-section under the same pressure settings you might create a further refinement of the atomisation, i.e. turning the adjustment screw up.



5.3.2 PRESSURE SETTINGS FOR FLAT JET NOZZLES

There are 8 flat jet nozzle sizes from 0.6 to 2.0 available. There are 3 air cap types. Each air cap can be used in combination with 2 or 3 nozzle sizes. Only matching nozzle components may be used. During the calibration of the material pressure (P_{MAT}) and the atomizing air pressure (P_{ZL}) the air control lever shown in the figure B_03266 must be in central position. These presettings are based on a paint viscosity of 22 DIN 4 sec.

Pressure settings	Air cap 0.4-0.8	Air cap 1.0-1.4	Air cap 1.6-2.0
Material pressure (P_{MAT})	0.5 bar to 1.0 bar	1.0 bar to 2.0 bar	1.0 bar to 3.0 bar
Atomizing air pressure (P_{ZL})	1.0 bar to 2.5 bar	1.5 bar to 2.5 bar	1.5 bar to 3.0 bar

Note:

In the table, default values are included. Depending on the material, conditions and the desired result different values are possible or necessary.

By turning the adjusting screw (A_{MV}) side of the gun, the outlet cross-section can be adjusted on the material valve. By reducing of this cross-section under the same pressure settings you might create a further refinement of the atomisation, i.e. turning the adjustment screw up.

Note:

In this setting the spray pattern is reduced.



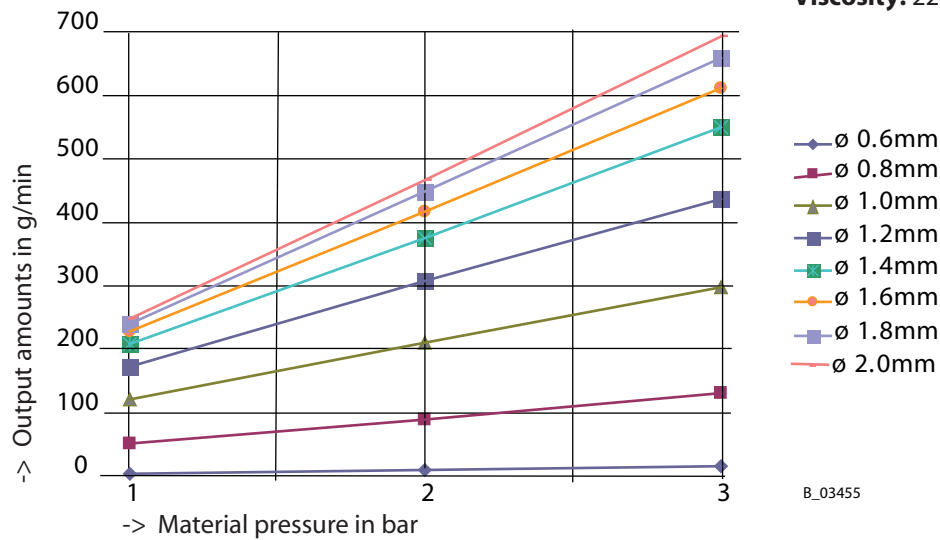
5.3.3 ELECTROSTATIC AND ATOMIZATION

The electrostatic charging of the spray cloud produces a more homogeneous distribution of paint particles on the object.
See also Chapter 4.5.3.

5.3.4 OUTPUT MEASURED

Flat jet nozzles

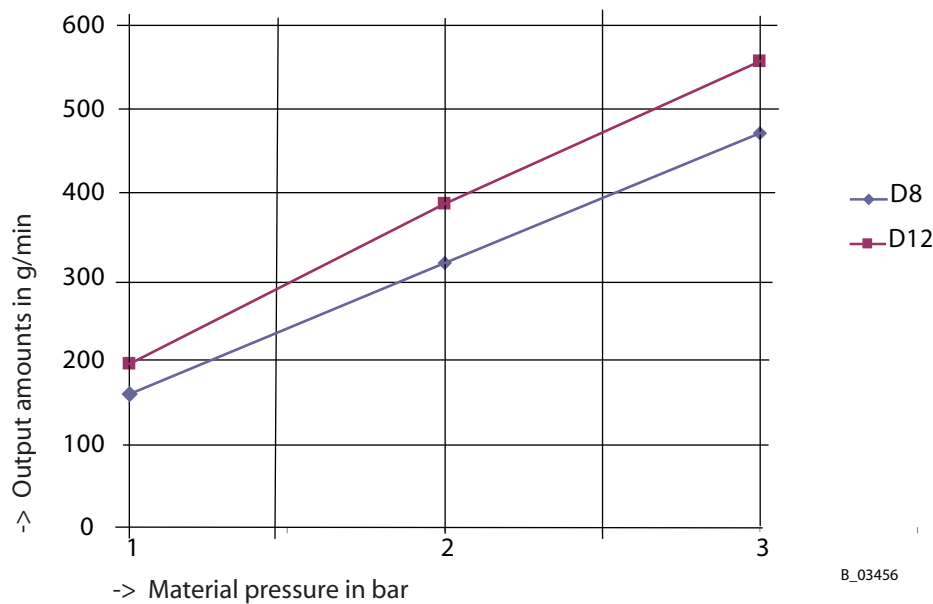
Device: GM 500EAF
Viscosity: 22 DIN 4 sec.



B_03455

Round jet nozzles

Device: GM 500EAR
Viscosity: 22 DIN 4 sec.





B_03456



5.4 START-UP

5.4.1 GENERAL RULES FOR MAKING ADJUSTMENTS TO THE SPRAY GUN

→ Observe **safety instructions** in Chapter 2.

	 DANGER
	<p>High voltage field! Danger to life from malfunctioning heart pacemakers</p> <p>Ensure that persons with heart pacemakers:</p> <ul style="list-style-type: none"> → Do not work with the electrostatic spray gun. → Remain outside the area of the electrostatic spray gun/work-piece.

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	 WARNING
	<p>Unintentional putting into operation! Risk of injury</p> <p>Before all work on the unit, in the event of work interruptions and functional faults:</p> <ul style="list-style-type: none"> → Switch off the energy/compressed air supply. → Relieve the pressure from the spray gun and unit. → Secure the spray gun against actuation. → By functional faults: Identify and correct the problem, proceed as described in chap. „Trouble shooting“.

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5.4.2 PREPARATION FOR STARTING UP

The following points should be noted before starting up:

- For earthing see paragraph 5.1.5; make sure that all other conductive parts within the work area are earthed.
- Connect the material hose to spray gun and material pump or pressure tank.
- Check that all material-conveying connections are correctly connected.
- Connect air hose to spray gun and to oil-free, dry air, approx. 0.25 MPa; 2.5 bar; 36 psi. Compressed air quality class 3.5.2 according to ISO 8573.1.
- Check that all air-conveying connections are correctly connected.
- Connect the electric cable to the spray gun and to the VM 5000 or VM 500 control unit.
- Visually check the permissible pressures for all the system components.
- When using a Wagner pneumatic pump:
 - Check the level of the release agent and if necessary fill the release agent up.

- Provide material container, containers for detergent and an empty container for return.
- Connect the system to the air and power supply.
- A basic flushing of system must be carried out for initial start up. Make sure, that no nozzle is inserted into the gun.

	WARNING
	<p>Sparks form when the plug is removed! Explosion hazard</p> <p>When using the spray gun in explosion hazard areas: → The cable connection may neither be separated nor put together in this area. Cover sleeve plus warning sign have to be secured over the screw on the connector.</p>

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Attention: gun cable to control unit

Cover sleeve with warning sign have to be secured over the screw (84) on the connector.



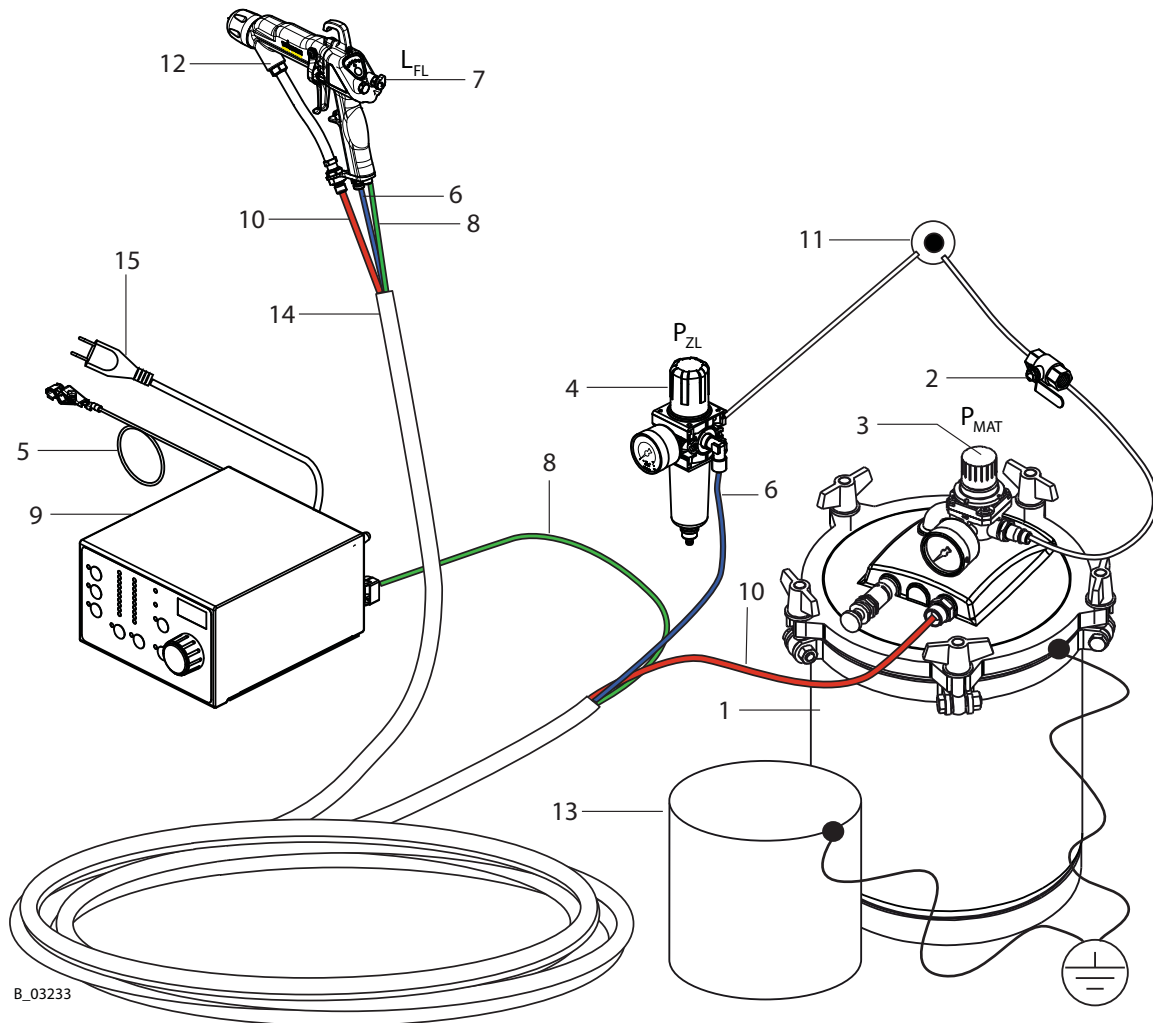
B_03691

Attention: guns with electrical extension cable

Cover sleeves with warning signs have to be secured over the screws (84) on the connectors.



B_03690



B_03233

5.5 WORKING

5.5.1 FILLING WITH WORKING MATERIAL

1. Provide an empty container for return (13). See image B_03233.
2. Put the container with work material into the pressure tank (1) and close the pressure tank.
3. Open the stop valve (2).
4. Adjust approx. 0.05 to 0.15 MPa; 0.5 to 1.5 bar; 7 to 22 psi on the pressure regulator (3).
5. Point the gun, without nozzle, into container (13) and open it.
6. Close stop valve (2) as soon as pure working material without any air inclusions starts coming from the gun.
7. Close the spray gun if the pressure tank is depressurised.
8. Dispose of the contents of the container (13) according to the local regulations.

5.5.2 START-UP FOR SPRAYING

1. Insert the desired nozzle into the gun.
2. Open the stop valve (2).
3. Turn on the control unit (9).
4. Set the material supply to operating pressure P_{MAT} .
5. Spray on a test object (pull trigger).
6. Adjust the spray pressure at the paint pump and/or pressure tank (1) according to the nozzle and object being sprayed.
7. Set air adjustment at the back of the gun to the center position and now open atomizing air (4) and adjust optimally according to the nozzle and object being sprayed.

For round-jet method:

8. By turning at the air adjustment or at the stop screw on the side of the gun, the jet of the atomizing air is also influenced.

Note

The size of the air cap must match with the nozzle size.

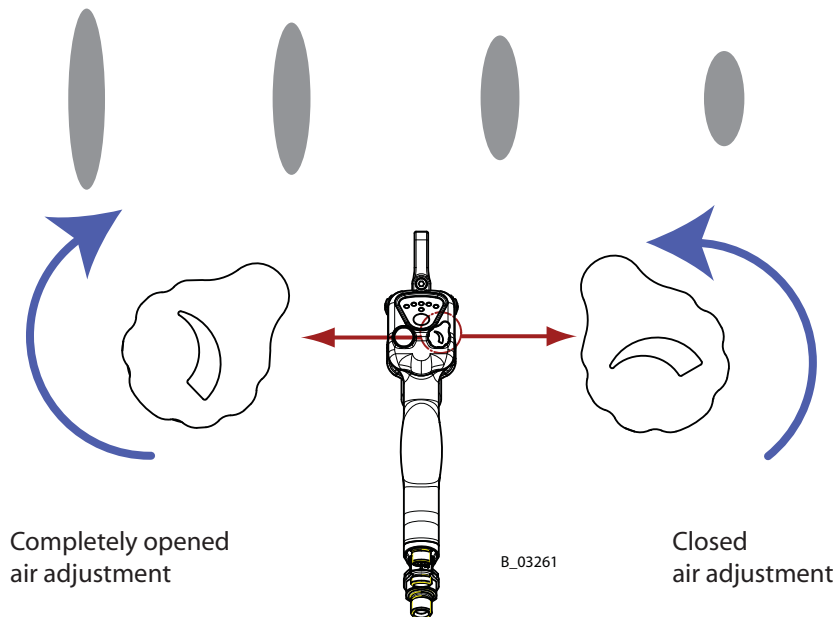
For flat-jet method:

9. Change the width of the spray jet by turning the air adjustment back to the spray gun or by appropriate selection of the nozzle.

Notes

A change in the material quantity is achieved by:

- changing the material pressure
- or
- use a different nozzle size (see accessories).



5.5.3 CHANGING FROM AIR-ROUND JET TO AIR-FLAT JET

CAUTION

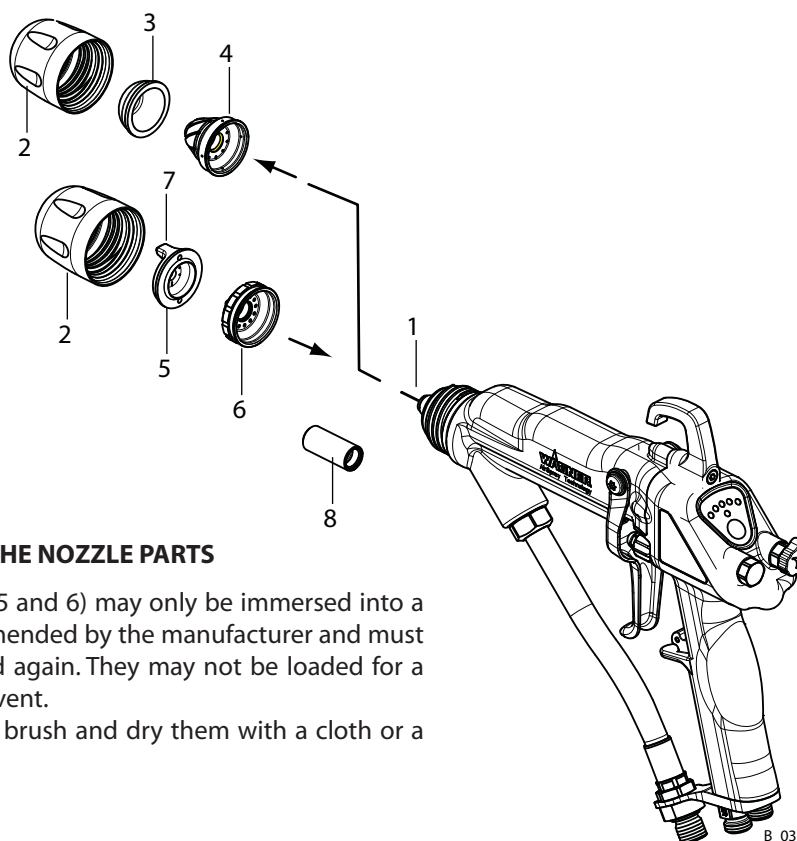
Defective electrode!

Material damage due to functional faults.

→ Do not damage the electrode.

SIHL_0033_GB

1. Switch off the control unit.
2. Relieve spray gun and unit pressure.
3. Replace paint with cleaning solvent.
4. Set material pressure. Switch off the atomizing air.
5. Flush the spray gun out thoroughly.
6. Relieve the material pressure on the spray gun and the device!
7. Unscrew nozzle nut (2) by hand.
8. Remove AR 5000 air cap (3). Unscrew and remove AR 5000 nozzle (4) by hand.
9. Clean the spray gun front page with dampened cloth carefully. Pay attention to the electrode (1). Use the protection cap for the valve needle (8).
10. Screw in and tighten slightly AF 5000 flat jet nozzle (6) by hand.
11. Put on the AF 5000 air cap (5). Screw the union nut (2) onto the spray gun body.
12. Set the desired flat jet level with the air cap horns (7) and then tighten slightly the union nut by hand.



5.5.4 CLEANING OF THE NOZZLE PARTS

The nozzle parts (2; 3; 4; 5 and 6) may only be immersed into a cleaning solvent, recommended by the manufacturer and must be immediately removed again. They may not be loaded for a long time in cleaning solvent.

Clean these parts with a brush and dry them with a cloth or a blow gun.

B_03268

6 MAINTENANCE

→ Observe **safety instructions** in Chapter 2.

6.1 PERIODICALLY CHECKS

For the safe operation of electrostatic manual coating systems for flammable liquid spraying materials are intervals for periodically inspections defined as follows:

Inspection point	Inspection interval	Remarks
Gun cleaning, flushing	daily	Chapter 2.2.4; chapter 6.1
Earthing measures	weekly	Chapter 2.2.2; chapter 5.1.5
Inspection for damage	weekly	Chapter 6.2; 6.3; 6.4 and 6.5
Locking of the technical ventilation with the electrostatic manual coating system	yearly	Chapter 5.1.2

The above recommended intervals are maximum values and may be modified from operator depending on the local and operational conditions and contamination.



Damaged devices must be taken out of service immediately and repaired.

6.2 CLEANING AND DECOMMISSIONING


The spray gun and the unit must be cleaned every day. Only use the cleaning solvent recommended by the paint manufacturer.

CAUTION
<p>Cleaning agent in the air duct! Functional faults caused by swollen seals</p> <p>→ Never immerse the spray gun in cleaning agent.</p>

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	 WARNING
	<p>Incorrect maintenance/repair! Risk of injury and damage to the equipment</p> <p>→ Repairs and part replacement may only be carried out by specially trained staff or a WAGNER service center.</p> <p>→ Before all work on the unit and in the event of work interruptions:</p> <ul style="list-style-type: none"> - Switch off the energy/compressed air supply. - Relieve the pressure from the spray gun and unit. - Secure the spray gun against actuation. <p>→ Observe the operating instructions when carrying out all work.</p>

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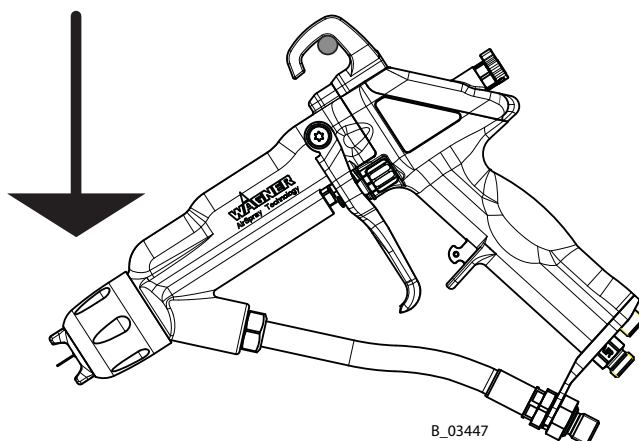
	<p style="text-align: center;">⚠ DANGER</p> <p>Exploding gas/ air mixture! Danger to life from flying parts and burns</p> <p>→ Never spray into a closed container. → Earth the container.</p>
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1. Switch off control unit.
2. Ensure that the material pressure is relieved and shut off the atomizing air supply to the gun.
3. Connect the detergent supply.
4. Set material pressure.
5. Actuate the trigger guard. Flush the gun through thoroughly.
6. Relieve the pressure of gun and unit!
7. Remove nozzle and clean separately.
8. Clean the spray gun body with a cleaning agent recommended by the manufacturer and dry with a cloth or blow gun.

<p style="text-align: center;">CAUTION</p> <p>Cleaning agent in the air duct! Functional faults caused by swollen seals Discharge current to ground -> no high voltage</p> <p>→ Always point the spray gun down when cleaning. → Ensure that neither paint nor cleaning agent enters the air duct. → When taking a break from work or when stored for a longer period, the spray gun has to be positioned correctly with the attachment pointing downwards.</p>
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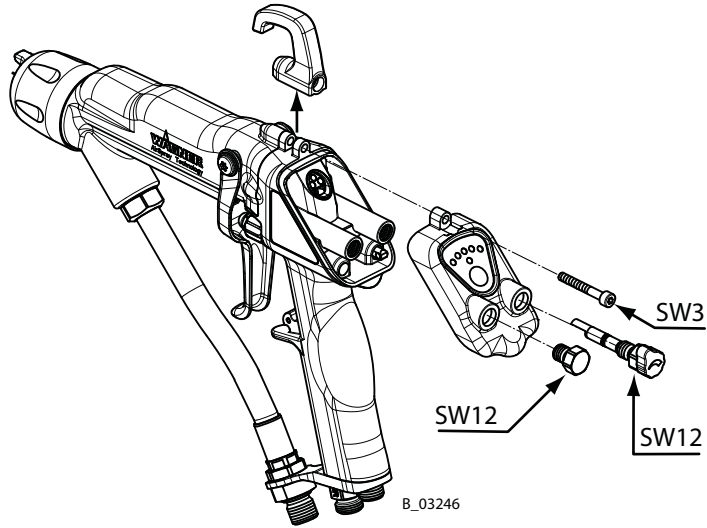
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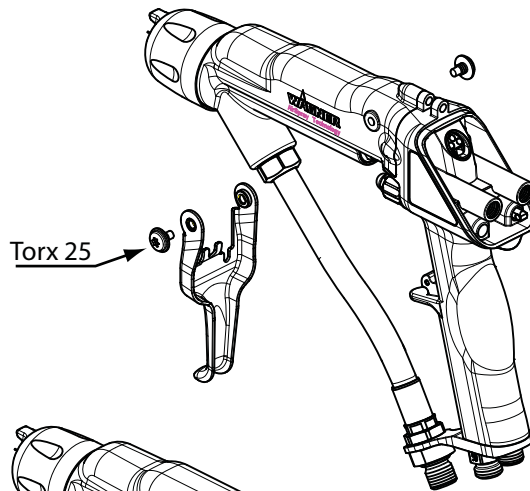
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6.3 DISMANTLING OF THE SPRAY GUN

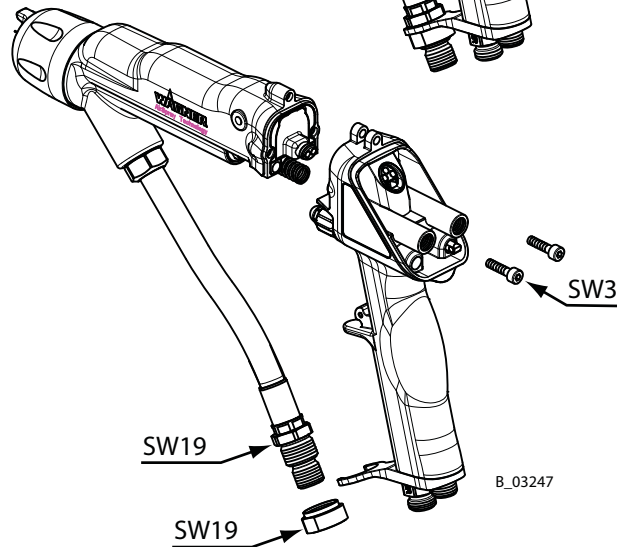
1



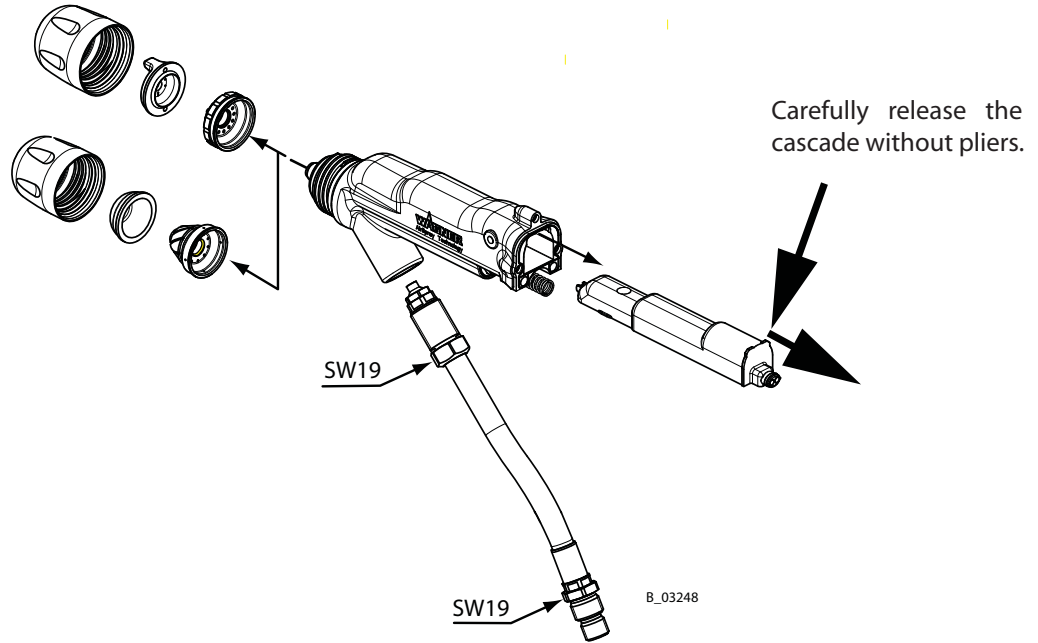
2



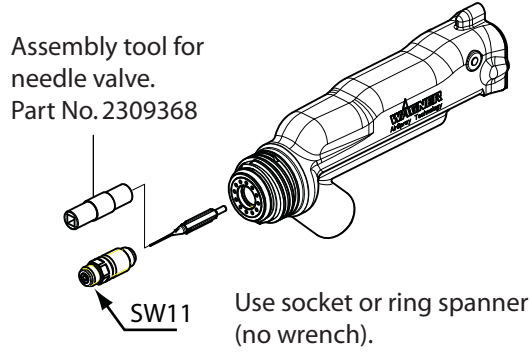
3



4

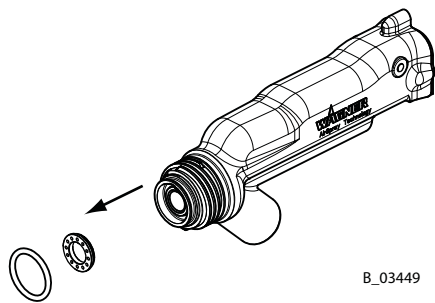


5

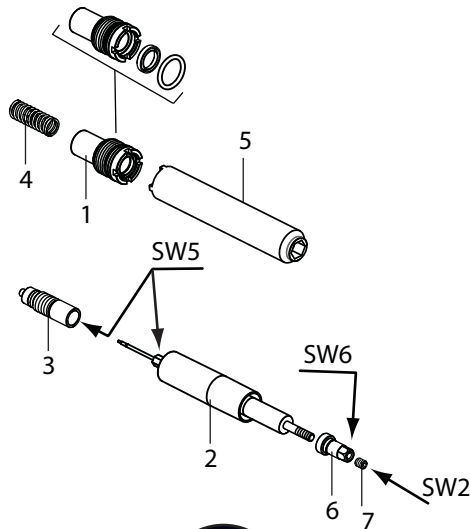
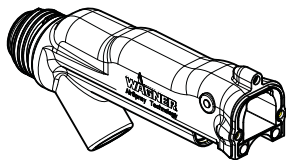
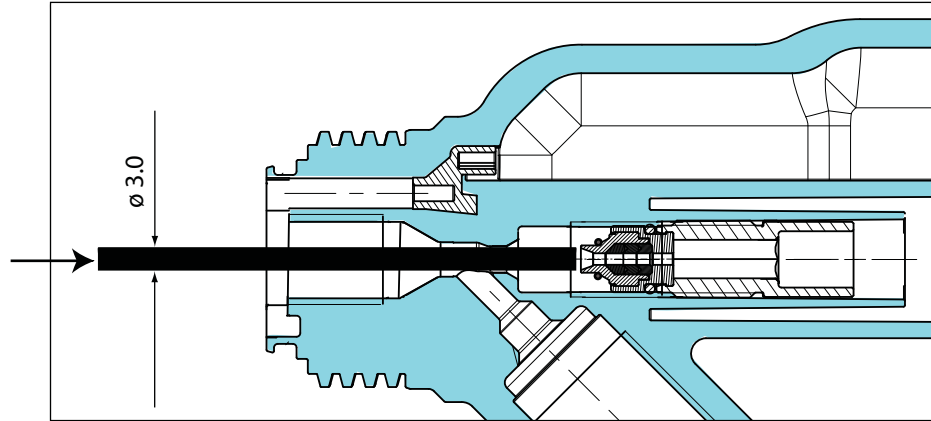


Note:
Loosen valve tip Air by hand using an assembly tool.

6



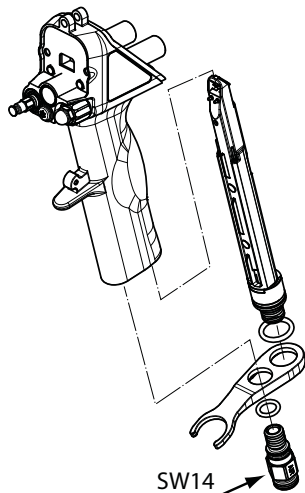
7



1. Remove pressure spring (4).
2. Loosen clamping screw (1) completely with assembly tool (5).
3. Unscrew the complete package (3) via the complete valve rod unit (2, 6 and 7) or pull out the valve rod unit and unscrew it using an Allen key SW5.
4. If the loosened package (3) in the hole jammed, emit from the front (see upper image).

B_03198

8

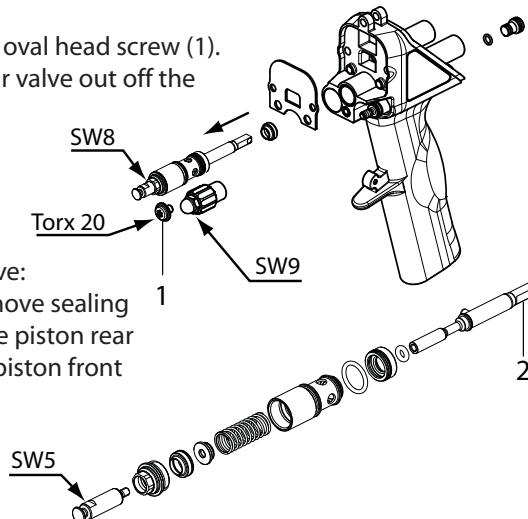


B_03250

9

1. Undo the oval head screw (1).
2. Pull the air valve out off the hole.

Removing air valve:
Unscrew and remove sealing nut SW8. Hold the piston rear (2) and unscrew piston front SW5.



6.4 CLEANING THE PARTS AFTER DISASSEMBLY

ATTENTION

Please note:

- All reusable parts (except for the parts that conduct the high-voltage such as cascade, end piece, plug compl. etc.) should be cleaned thoroughly using a suitable cleaning agent.
- The end piece, plug compl. and the handle inside must be clean and dry after cleaning. Care should be taken that these parts remain free of solvents, grease or sweat from the hands (salt water).
- Only spare parts are used which have undergone an EC type examination and are subject to a quality assessment (production monitoring) according to Directive 94/9/EC.
- Spare parts may have safety-relevant properties.
- Defective parts, O-rings and seal sets must always be re-placed.



WARNING

Incompatibility of cleaning agent and working medium!

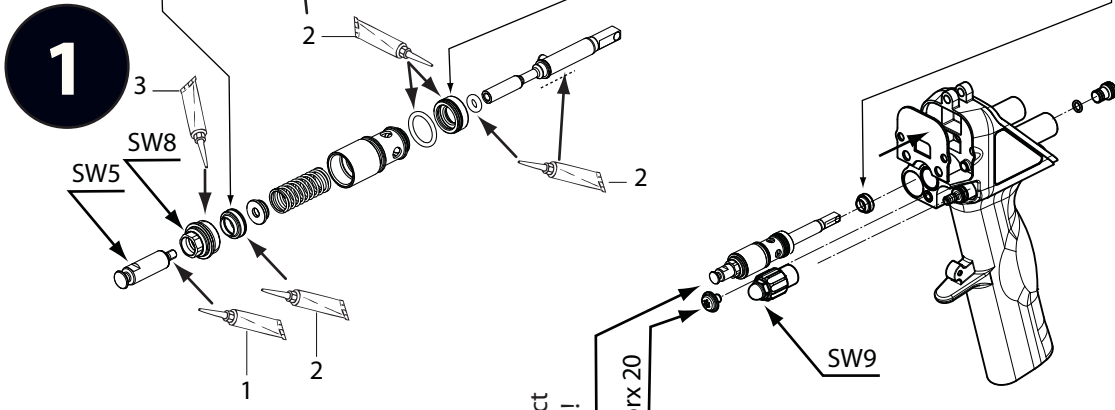
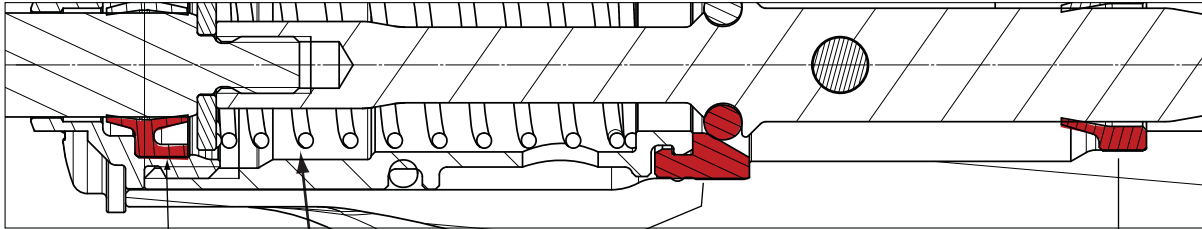
Risk of explosion and danger of poisoning by toxic gasses

- Check the compatibility of cleaning agent and working medium in accordance with safety data sheets.

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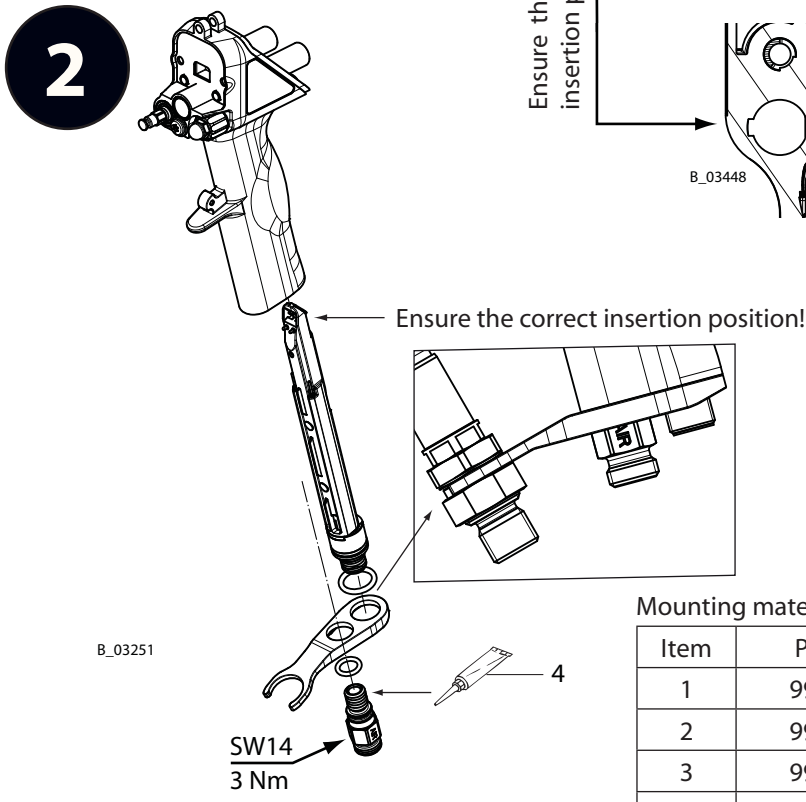
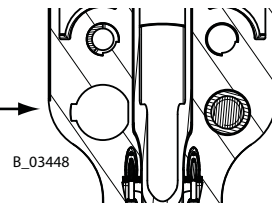
In chapter 10 can be found part numbers for gun spare parts as well as for wearing parts such as seals.

6.5 ASSEMBLING THE SPRAY GUN



Ensure the correct insertion position!

Torx 20



Mounting materials:

Item	Part No.	Description
1	9992590	Loctite 222
2	9992698	Vaseline white PHHV II
3	9992831	Loctite 542
4	9992511	Loctite 243

3

Insertion position compl. package

SW2
1Nm

X

Valve rod unit
Length adjusting measure
 $X = 122 \pm 0.1$

Push together the valve rod unit and the compl. package.

Screw in together the valve rod unit and the compl. package.

Remove the valve rod unit.

Tighten the compl. package.

Carefully insert the valve rod unit and mount the complete clamping screw (1) with assembly tool (5).

SW5
0.4-0.5 Nm

SW6
0.4 - 0.5 Nm

SW5
0.4-0.5 Nm

2

2

4

1

5

0.5 Nm

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4

Ensure the correct insertion position!

5

Tighten slightly valve needle by hand using an assembly tool.
(Part No. 2309368)

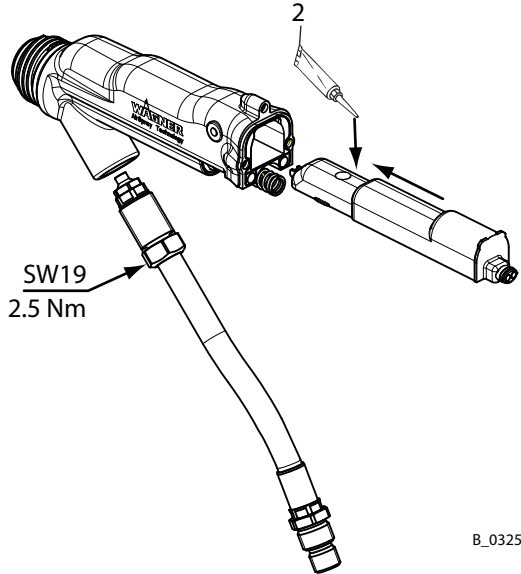
SW11
1.2 Nm

Note:
Use socket or ring spanner
(no wrench).

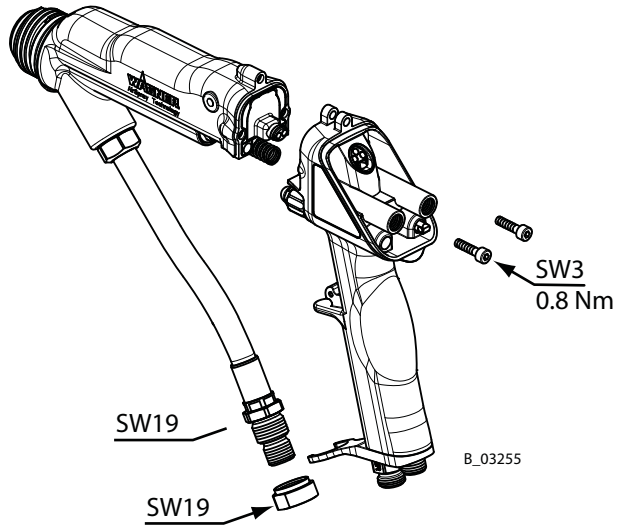
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6

Clean and degrease the inside of the end piece and the cascade, then grease the cascade surface with Vaseline.

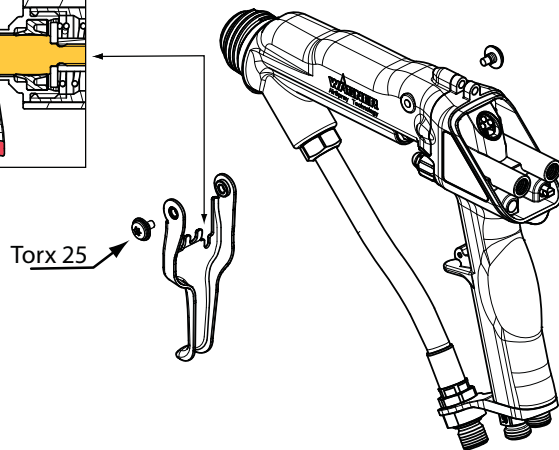
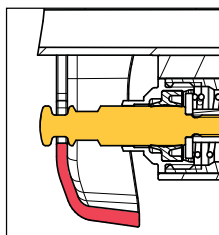


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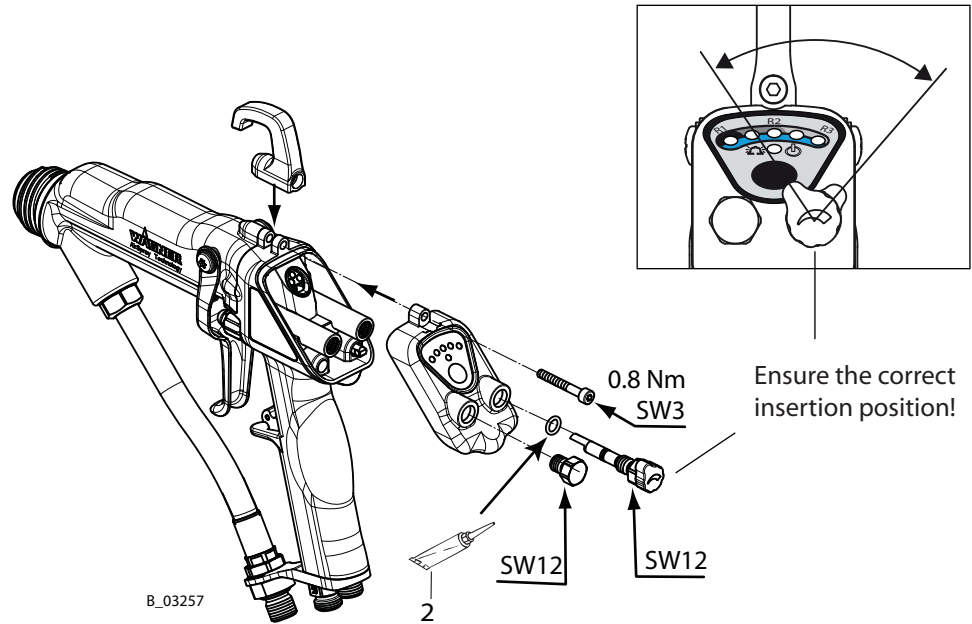


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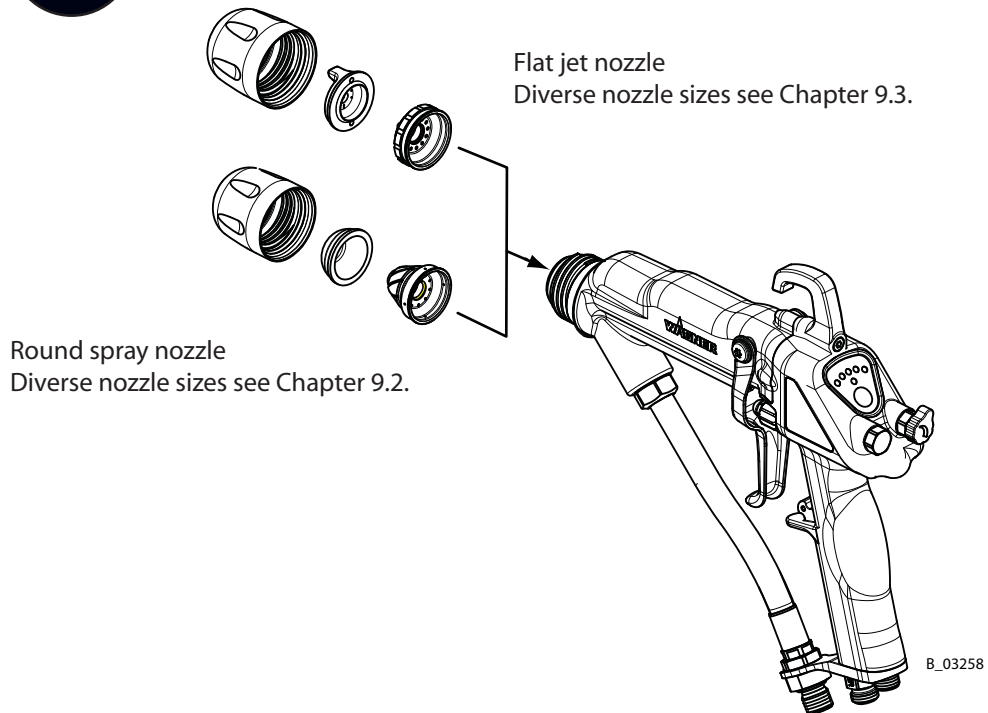
Push the trigger upward into the air valve piston.



9



10



6.6 FUNCTION TEST AFTER ASSEMBLY OF THE GUN

6.6.1 CHECKING THE HIGH-VOLTAGE

Necessary test equipment:

VM 500 or VM 5000 control unit and HV200 high-voltage tester.

High-voltage measurements on spraying gun.

Connect gun cable to control unit. Take the spray gun in your hand and hold into open space. Switch on control unit and actuate trigger guard.

The high-voltage should be 60 to 65 kV with dry ambient air. The value can be checked with the display on the control unit (VM 5000).

Note

The gun must be clean and dry and must not have any colour or cleaning agent residues.

In the case of ambient air with a high air humidity, the measured value reduces to 50 to 55 kV.

High-voltage measurement with high-voltage tester

Place the ball of the high-voltage tester on the gun electrode and switch on the high-voltage. The measured value should be 70 to 80 kV.

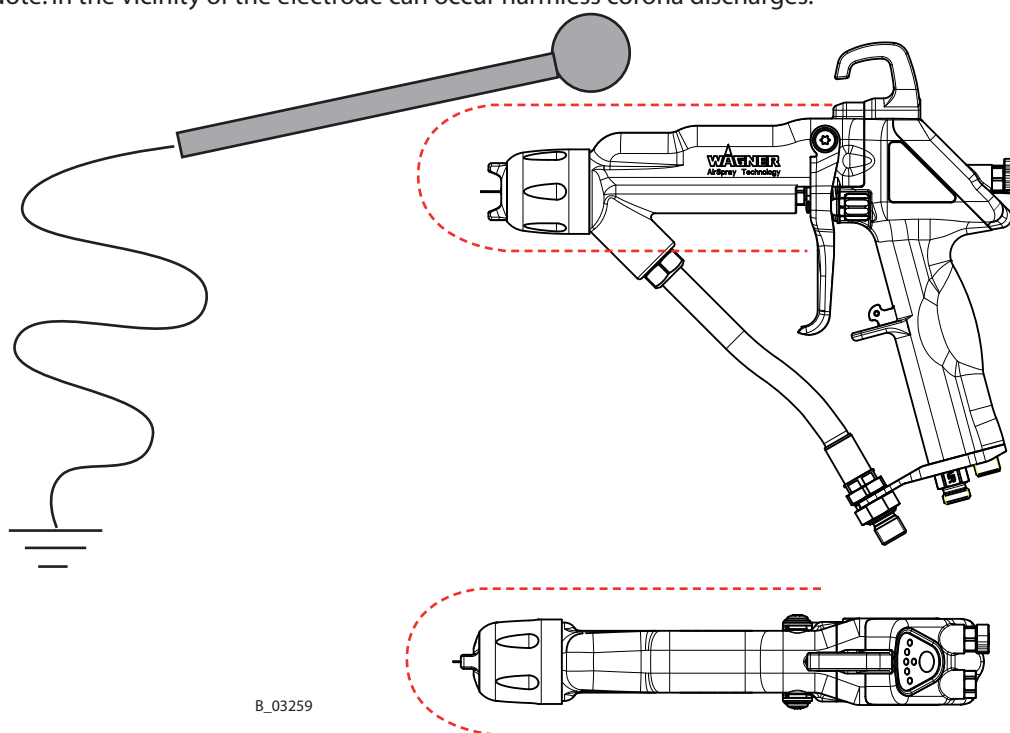
Note

- When measuring the high-voltage the gun and the measuring device should be held at arms length as far away from the body as possible.
- There should be no chargeable objects within a radius of 1 m; 3.28 ft of the place where the measurements are taken.
- The placing of the measuring ball of the high-voltage measuring device reduces the spraying of the high-voltage electrode. As a result the high-voltage value increases compared to the spraying in the free space.

Disruptive discharge test

Check the gun against earth with the earthing rod. No sparks should be formed.

Note: In the vicinity of the electrode can occur harmless corona discharges.



6.6.2 AIR TESTS

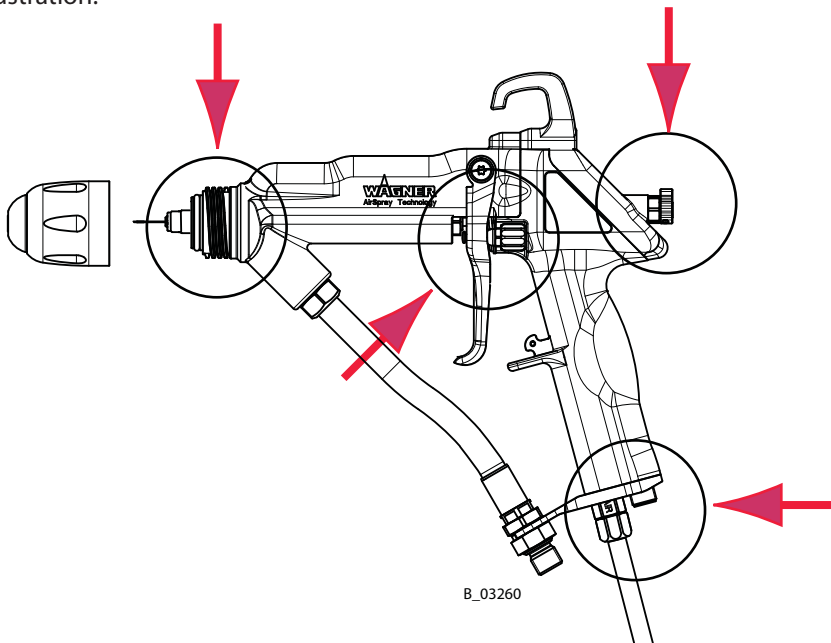
Connect test or air hose to the spray gun and switch on mains pressure 0.8 MPa; 8 bar; 116 psi max.

Checking the air valve

The air valve must switch on and off cleanly.
Test up to approx. 0.8 MPa; 8 bar; 116 psi.

Air tightness

With the trigger guard unactuated, test for air tightness at the points marked in the illustration:



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6.6.3 MATERIAL PRESSURE TEST

Connect low pressure hose to the spray gun.

Test the spray gun for tightness with solvent or spray oil (e.g. Macrol 52) and a max. pressure of 0.8 MPa; 8 bar; 116 psi.

Observe the following gun components:

Material connection, nozzle body, material valve (no after-spraying).

	<p style="text-align: center;">! DANGER</p> <p>Exploding gas/ air mixture! Danger to life from flying parts and burns</p> <ul style="list-style-type: none"> → Never spray into a closed container. → Earth the container.
--	--

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6.6.4 CHECK SPRAY PATTERN

Start air-spraying (without electrostatics)

1. Start up with material supply set to approx. 0.05 to 0.15 MPa; 0.5 to 1.5 bar; 7 to 22 psi operating pressure.
2. Spray (pull trigger) and check the atomisation.
3. Set the fluid pressure on the material supply to the point where a further increase in fluid pressure would significantly improve fluid atomization.
4. Open air pressure regulator for the atomizer air and adjust so as to achieve optimal atomization.
5. The width of the spray jet can be adjusted using the air adjustment (16) (only for flat-jet method).

Note

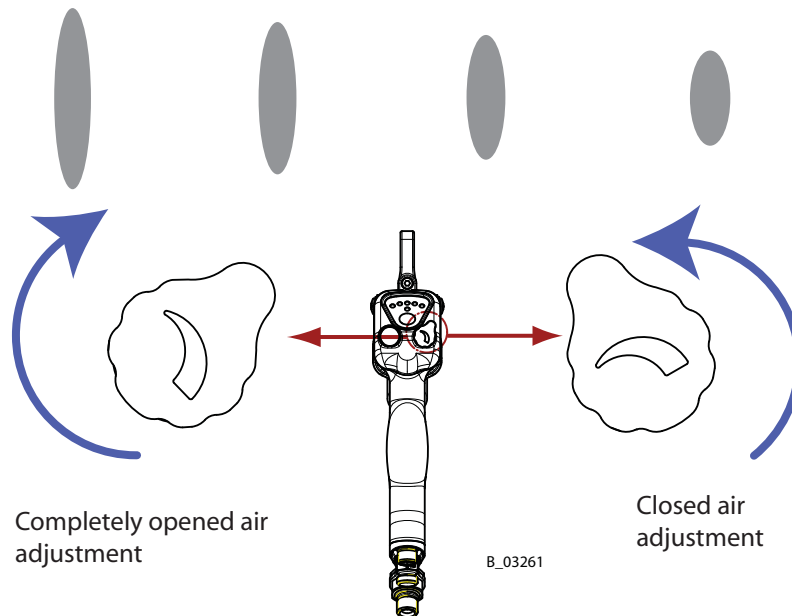
The paint output volume can be changed by:

- Changing the material pressure or
- using a different flat jet nozzle (see Chapter 9).
- Reduction of the material valve stroke.

Influence of the air adjustment on the spray pattern shape

The spray pattern can be adjusted to suit the object being sprayed using the air adjustment. The illustration below shows the influence of the shaping air regulator on the spraying pattern.

Other nozzle sizes can be used to obtain larger or smaller spraying patterns.



7 TROUBLE SHOOTING AND SOLUTION

Functional fault	Cause	Remedy
Insufficient material output	• Nozzle too small.	• Select larger nozzle (see nozzle table 9.1 and 9.2).
	• Material pressure too low.	• Increase material pressure.
	• High pressure filter at pump clogged.	• Clean or replace filter.
	• Nozzle is clogged.	• Nozzle cleaning.
Poor spray pattern	• Wrongly adjusted atomizing air.	• Readjust the atomizing air.
	• Nozzle too large.	• Select smaller nozzle (see nozzle table).
	• Material pressure too low.	• Increase material pressure at the material supply.
	• Material viscosity too high.	• Thin material in accordance with the manufacturer's instructions.
Valve rod leaks	• Seals at the valve rod are damaged.	• Replace the seals (see chapter 6).
Poor wrap-around	• Inadequate earthing.	• Check earthing.
	• Inadequate electrical resistance of the paint.	• Check resistance of paint (see paragraph 4.1.1).
	• Spraying pressure too high.	• Readjust spraying pressure.
Back-spray	• Inadequate earthing.	• Check earthing.
	• Distance between spray gun and object too large.	• Reduce distance between spray gun and object.
No wrap-around	• High-voltage switch is in the off position.	• Switch on high-voltage.
	• No electrostatics.	• Repair malfunction as laid down in the control unit operating instructions.

8 PRODUCT DISPOSAL

	Note
	<p>Do not dispose of waste electrical equipment with the household refuse!</p> <p>In accordance with European Directive 2002/96/EC on the disposal of waste electrical equipment and its implementation in national law, this product may not be disposed of with the household refuse, but must rather be recycled in an environmentally correct manner. Your waste Wagner electrical device will be taken back by us or our representatives and disposed of environmentally correctly. Please contact one of our service points or one of our representatives or us directly to this purpose.</p>

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9 ACCESSORIES

9.1 VALVE SEATS, AIR/ VALVE TIPS, AIR

9.1.1 VALVE SEATS

Part-No.	Description
2312179	Valve seat, Air compl. (Steel)
2312176	Valve seat, Air compl. (PEEK)



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9.1.2 VALVE TIPS

Part-No.	Description
2312184	Valve tip, Air compl. (PEEK)
2312185	Valve tip, Air compl. (Steel)



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9.2 ROUND JET NOZZLES

9.2.1 AR 5000 AIR CAPS

Part No.	Description
2310557	AR 5000 air cap (D8)
2315049	AR 5000 air cap (D12)



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9.2.2 AR 5000 NOZZLES

Part No.	Description
2310558	AR 5000 nozzle (D8)
2315050	AR 5000 nozzle (D12)



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9.3 FLAT JET NOZZLES

9.3.1 AF 5000 AIR CAPS

Part No.	Description
2310506	AF 5000 air cap - 0.4-0.8S
2310507	AF 5000 air cap - 1.0-1.4S
2310508	AF 5000 air cap - 1.6-2.0S
2314255	AF 5000 air cap - 0.4-0.8W (wide)
2314256	AF 5000 air cap - 1.0-1.4W (wide)
2314258	AF 5000 air cap - 1.6-2.0W (wide)



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9.3.2 AF 5000 NOZZLES

Part No.	Description
2310539	AF 5000 nozzle - 0.6 mm (black)
2310540	AF 5000 nozzle - 0.8 mm (yellow)
2310541	AF 5000 nozzle - 1.0 mm (red)
2310542	AF 5000 nozzle - 1.2 mm (green)
2310543	AF 5000 nozzle - 1.4 mm (brown)
2310544	AF 5000 nozzle - 1.6 mm (white)
2310545	AF 5000 nozzle - 1.8 mm (blue)
2310546	AF 5000 nozzle - 2.0 mm (black)



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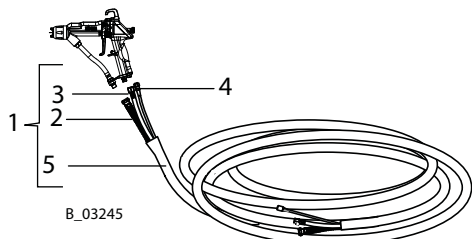
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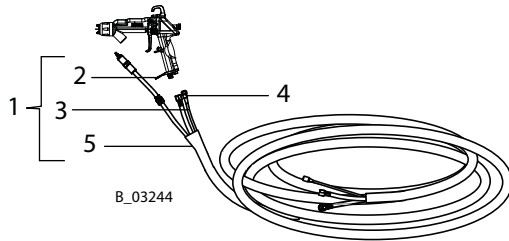
9.4 HOSES AND ELECTRICAL CABLES**9.4.1 STANDARD HOSE SETS AND COMPONENTS**

Item	Qty	Part No.	Description
1	1	2309853	GM 5000EA hose set (7.5 m)
Consisting of:			
2	1	2312012	Low pressure hose-DN6-PN15-G $\frac{1}{4}$ "-7.5 m-PFA
3	1	2312060	Air hose, compl. (8.0 m)
4	1	2307293	GM 5000E gun cable (10.0 m)
5	7 m	3676437	PP30 protective hose mesh (7.0 m)

Item	Qty	Part No.	Description
1	1	2309854	GM 5000EA hose set (10 m)
Consisting of:			
2	1	2312013	Low pressure hose-DN6-PN15-G $\frac{1}{4}$ "-10 m-PFA
3	1	2312061	Air hose, compl. (10.5 m)
4	1	2309474	GM 5000E gun cable (15.0 m)
5	9.5 m	3676437	PP30 protective hose mesh (9.5 m)

Item	Qty	Part No.	Description
1	1	2309855	GM 5000EA hose set (15 m)
Consisting of:			
2	1	2312014	Low pressure hose-DN6-PN15-G $\frac{1}{4}$ "-15 m-PFA
3	1	2312062	Air hose, compl. (15.5 m)
4	1	2309475	GM 5000E gun cable (20.0 m)
5	14.5 m	3676437	PP30 protective hose mesh (14.5 m)

Item	Qty	Part No.	Description
1	1	2309856	GM 5000EA hose set (20 m)
Consisting of:			
2	1	2312015	Low pressure hose-DN6-PN15-G $\frac{1}{4}$ "-20 m-PFA
3	1	2312063	Air hose, compl. (20.5 m)
4	1	2309476	GM 5000E gun cable (25.0 m)
5	19.5 m	3676437	PP30 protective hose mesh (19.5 m)

9.4.2 HOSE SETS FOR LOW IMPEDANCE MATERIALS**Note to the material hose:**

- nominal pressure 20 bar
- inlet diameter 6 mm
- inside hose material FEP

Item	Qty	Part No.	Description
1	1	2309878	GM 5000EA hose set (7.5 m), Low R
Consisting of:			
2	1	2310464	EA material hose, compl. (7.5 m) LowR
3	1	2312060	Air hose, compl. (8.0 m)
4	1	2307293	GM 5000E gun cable (10.0 m)
5	7 m	3676437	PP30 protective hose mesh (7.0 m)

Item	Qty	Part No.	Description
1	1	2309879	GM 5000EA hose set (10.0 m), Low R
Consisting of:			
2	1	2310465	EA material hose, compl. (10.0 m) LowR
3	1	2312061	Air hose, compl. (10.5 m)
4	1	2309474	GM 5000E gun cable (15.0 m)
5	9.5 m	3676437	PP30 protective hose mesh (9.5 m)

Item	Qty	Part No.	Description
1	1	2309880	GM 5000EA hose set (15.0 m), Low R
Consisting of:			
2	1	2310466	EA material hose, compl. (15.0 m) LowR
3	1	2312062	Air hose, compl. (15.5 m)
4	1	2309475	GM 5000E gun cable (20.0 m)
5	14.5 m	3676437	PP30 protective hose mesh (14.5 m)

Item	Qty	Part No.	Description
1	1	2309881	GM 5000EA hose set (20.0 m), Low R
Consisting of:			
2	1	2310467	EA material hose, compl. (20.0 m) LowR
3	1	2312063	Air hose, compl. (20.5 m)
4	1	2309476	GM 5000E gun cable (25.0 m)
5	19.5 m	3676437	PP30 protective hose mesh (19.5 m)

9.4.3 GUN CABLE AND GUN CABLE EXTENSIONS

Part No.	Description
2307295	GM 5000E extension cable 10 m
2307296	GM 5000E extension cable 20 m



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9.5 REDUCTION FITTINGS FOR HIGH-PRESSURE HOSES

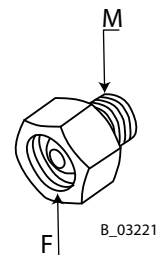
The classification of WAGNER fittings is consistent with the following classification, each separated by high-pressure and low pressure fittings.

DF	Double fitting - Male / Male thread
RF	Reduction fitting - Female / Male thread
SF	Adjustable screw - Female / Male thread: allows precise angle adjustment (Swivel)
EF	90° elbow - Adjustable or Male / Male thread (Elbow-Fitting)
BF	Bulkhead fastener - Male / Male thread with pressure resistant execution
PF	Stopper - Male thread to be closed (Plug-Fitting)
HF	Hose fitting with union nut and sealing cone (Hose-Fitting)

The short description of the fittings are as follows:

DF-	MM-	G3/4"-	1/4"NPS-	PN270-	SSt
					Materials, SSt = Stainless steel
					Nominal pressure (in bar)
					1. Thread, e.g. G1/4", 1/4"NPS
					2. Thread, e.g. G1/4", 1/4"NPS, M16x1.5
					M: Male (external thread) F: Female (internal thread)
Short description see list above, e.g. RF = Reduction Fitting					

Part No.	Description
384555	Reduction fitting-RF-FM-M16x1,5-1/4"NPS-PN530-SSt
384559	Reduction fitting-RF-FM-M16x1,5-G1/4"-PN530-SSt
384556	Reduction fitting-RF-FM-M16x1,5-3/8"NPSM-PN530-SSt
34041	Reduction fitting-RF-FM-1/4"NPS-M16x1,5-PN270-SSt
179732	Reduction fitting-RF-FM-1/4"NPS-3/8"NPS-PN270-SSt
179247	Reduction fitting-RF-FM-1/4"NPS-G1/4"-PN270-SSt

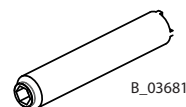
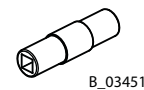
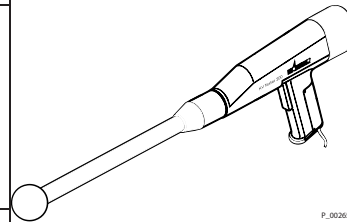


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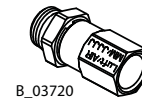
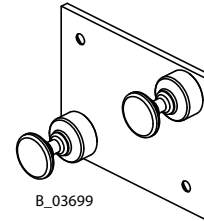
In the large Wagner Accessories Catalogue for wet coating can also be found other material screw connections.

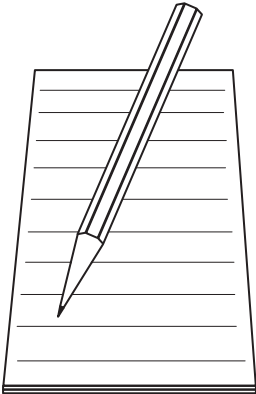
9.6 MISCELLANEOUS

Part No.	Description
2319653	Gun protective cover
259010	HV200 N high-voltage tester
2326041	Paint resistance measuring device
999080	Wet film thickness measurer
50342	Viscosity cup DIN 4 mm;0.16 inches
2309368	Assembly tool valve needle
2325263	Assembly tool clamping screw



Part No.	Description
2326485	GM 500E wall mount (left/right)
2324766	Swivel for air





A series of horizontal lines for writing, starting from the top right and extending down the page.

10 SPARE PARTS

10.1 HOW TO ORDER SPARE PARTS?

Always supply the following information to ensure delivery of the right spare part:

Part Number, description and quantity

The quantity need not be the same as the number given in the „Quantity“ column. This number merely indicates how many of the respective parts are used in each sub assembly.



The following information is also required to ensure smooth processing of your order:

- Address for the invoice
- Address for delivery
- Name of the person to be contacted in the event of any queries
- Type of delivery required (air freight or mail, sea route or overland route, etc.)

Marks in spare parts lists

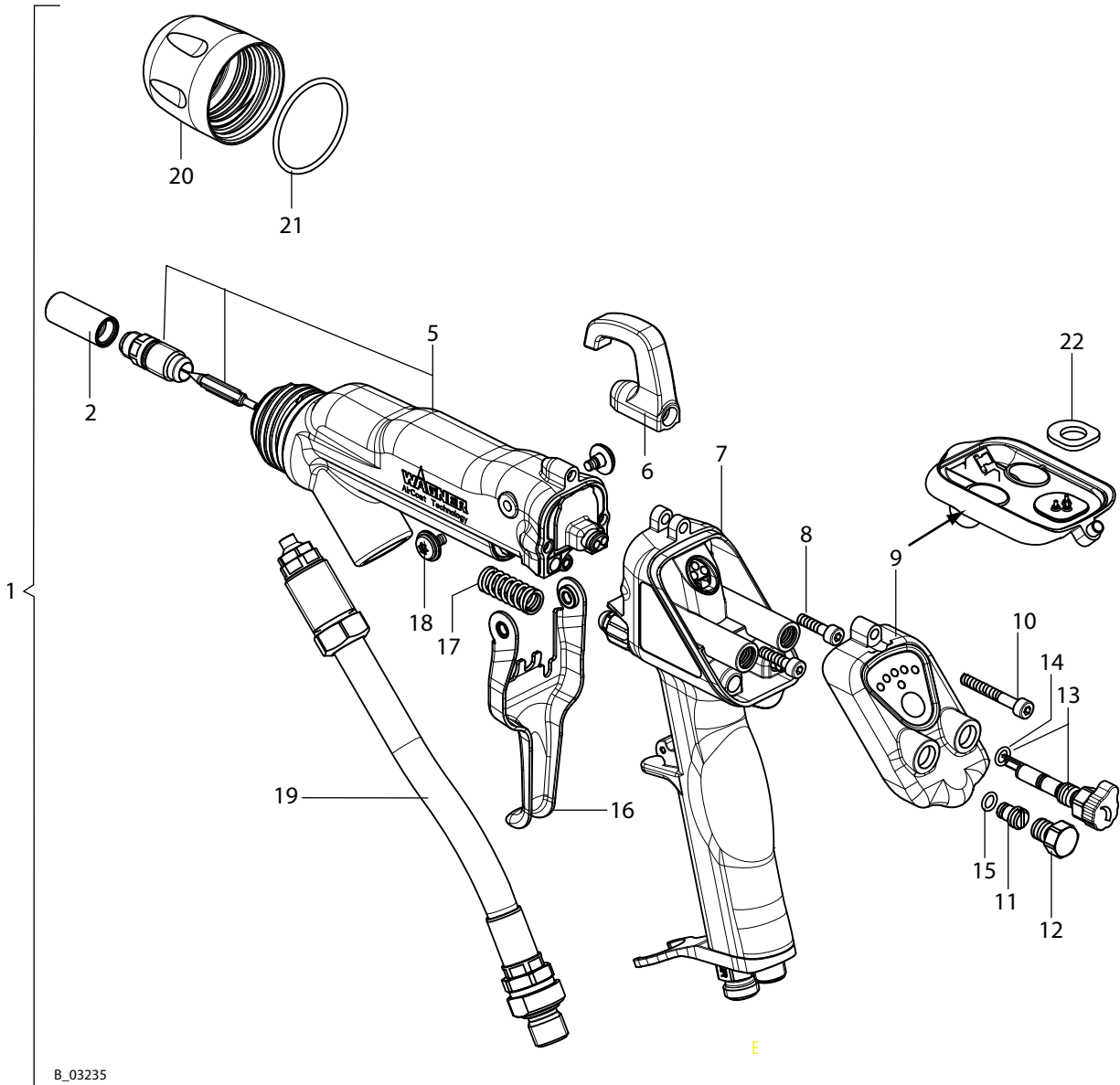
Note to column „K“ in the following spare parts lists.

- ◆ = Wearing parts
Note: No liability is assumed for wearing parts
- = Not part of standard equipment, available, however, as additional extra.

	 WARNING
	<p>Incorrect maintenance/repair! Risk of injury and damage to the equipment</p> <p>→ Repairs and part replacement may only be carried out by specially trained staff or a WAGNER service center.</p> <p>→ Before all work on the unit and in the event of work interruptions:</p> <ul style="list-style-type: none"> - Switch off the energy/compressed air supply. - Relieve the pressure from the spray gun and unit. - Secure the spray gun against actuation. <p>→ Observe the operating instructions when carrying out all work.</p>

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10.2 GM 500EA SPARE PARTS LIST

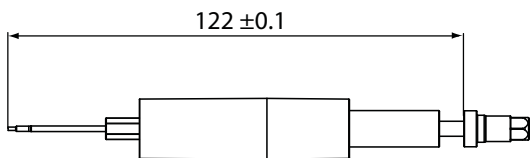
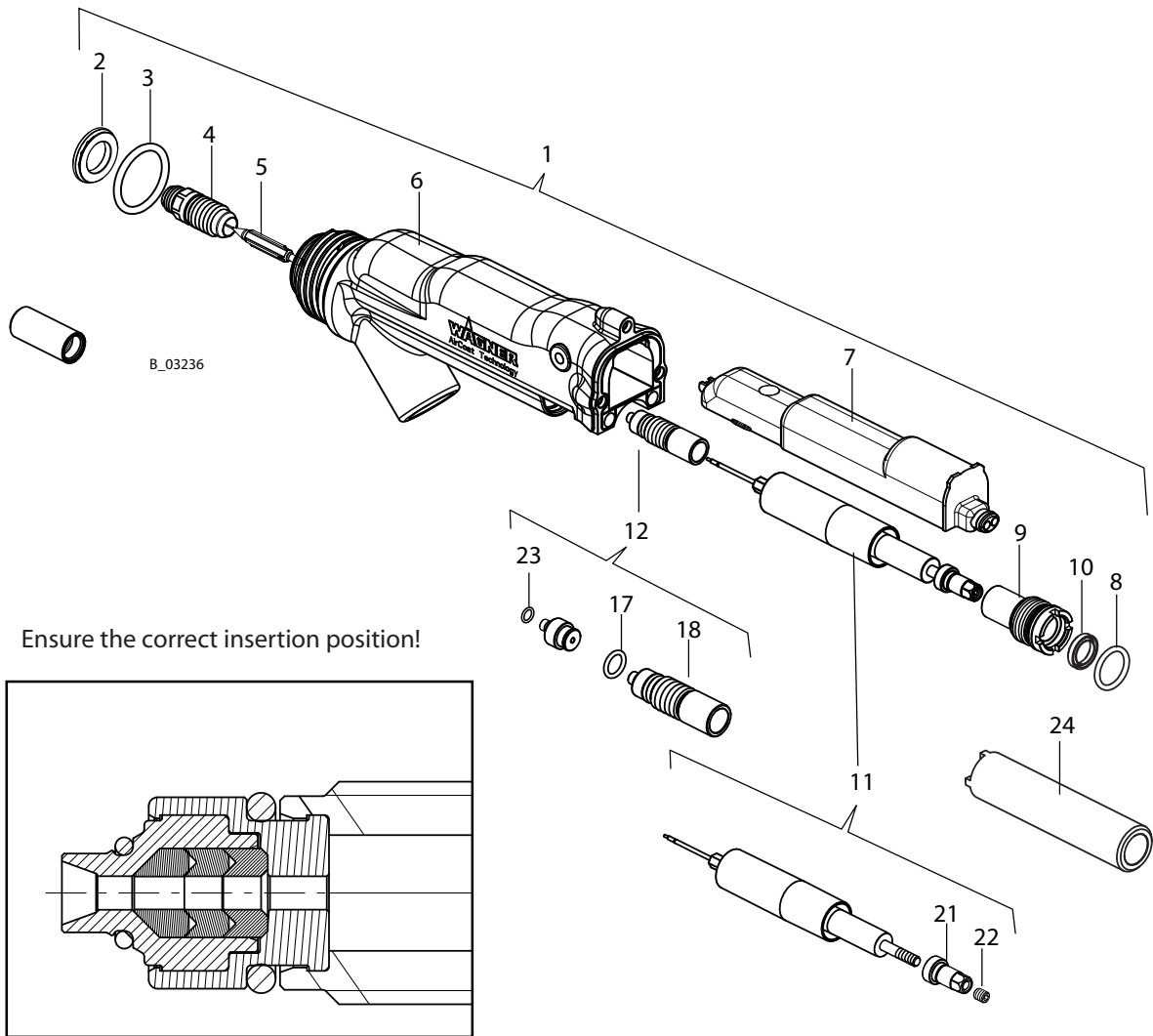


GM 5000EA spare parts list				
Item	K	Quantity	Part No.	Description
1		1	2309870	GM 5000EA basic version
2		1	2315709	Protection cap for valve needle
5		1	-	GM 5000EA end piece, compl. Details see chapter 10.2.1
6	◆	1	2314361	Hook
7		1	-	ES 5000 Air handle, compl. Details see chapter 10.2.2
8		2	9900308	Cheese head screw with hexagon
9		1	2312183	Cover, compl.
10		1	9900386	Cheese head screw with hexagon
11		1	2311970	Sealing plug
12		1	2307104	Lock screw
13		1	2312180	Air regulation, compl.
14	◆★	1	9971182	O-ring
15	◆★	1	9971182	O-ring
16	◆	1	2314360	Trigger
17		1	2311849	Cylindrical helical spring
18		2	2310617	Oval head screw with hexagon
19	◆	1	2314358	Material hose Air, compl.
20		1	2307039	Union nut
21	◆★	1	2311217	O-ring
22	◆★	1	2308699	Sealing cover
		1	2326335	GM 5000EA service set

◆ = Wear part

★ = Included in service set

10.2.1 GM 500EA SPARE PARTS LIST- END PIECE



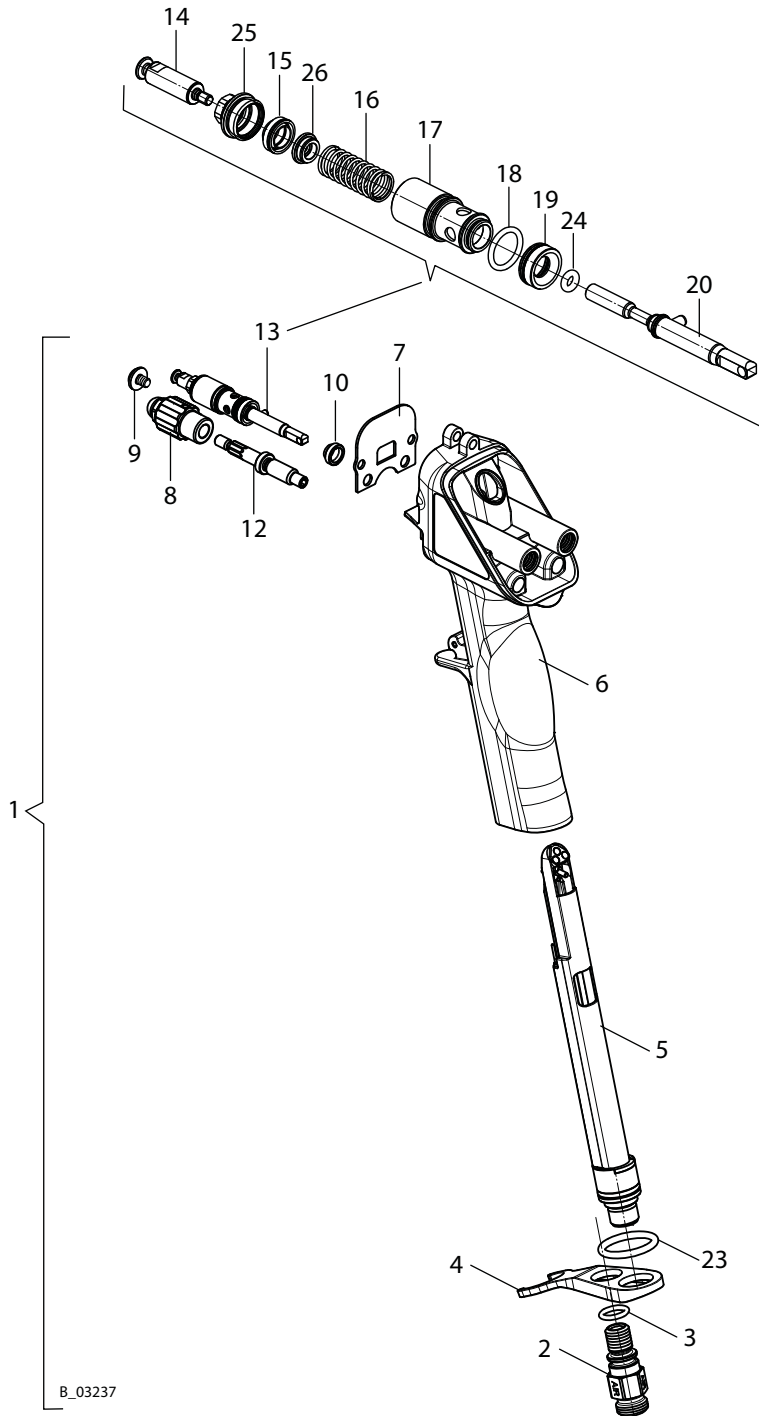
End piece spare parts list				
Item	K	Quantity	Part No.	Description
1		1	-	GM 500EA end piece, compl.
2	★	1	2309391	Air manifold ring Air
3	◆★	1	2307180	O-ring, sheathed
4	◆★	1	2312179	Valve seat Air, compl. (Steel)
4	◆●	1	2312176	Valve seat Air, compl. (PEEK)
5	◆★	1	2312184	Valve tip Air, compl. (PEEK)
5	◆●	1	2312185	Valve tip Air, compl. (Steel)
6		1	2314271	GM 500EA end piece
7		1	2312181	Cascade, compl.
8	◆★	1	9974166	O-ring
9		1	2307062	Clamping screw valve rod
10	◆★	1	2311562	Rod seal
11	◆	1	2312177	Valve rod unit Air
12	◆★	1	2312178	Package, compl.
17	◆	1	2311624	O-ring
18		1	2307051	Clamping screw package
21		1	2307059	Withdrawal nut
22		1	9901411	Thread pin with hexagon
23	◆	1	2320256	O-ring
24		1	2325263	Assembly tool clamping screw
		1	2326335	GM 500EA service set

◆ = Wear part

★ = Included in service set

● = Not part of standard equipment, available, however, as additional extra.

10.2.2 GM 500EA SPARE PARTS LIST - HANDLE



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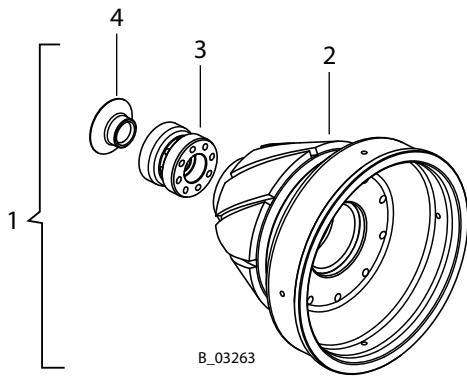
Handle spare parts list				
Item	K	Quantity	Part No.	Description
1		1	-	GM 5000EA handle, compl.
2		1	2307288	Nipple
3	◆★	1	9971025	O-ring
4		1	2315344	Hose holder
5		1	2312182	Plug, compl.
6		1	2314270	Handle, compl.
7	★	1	2307232	End piece seal
8		1	2325789	Adjusting screw, compl.
9		1	2309825	Oval head screw with hexagon
10	◆★	1	2310692	Seal
12		1	2307281	Threaded bolt
13		1	2312189	Air valve
14		1	2307935	Piston front
15	◆★	1	2307557	Seal
16		1	2312846	Cylindrical helical spring
17		1	2310680	Sleeve
18	◆★	1	9974218	O-ring
19	◆★	1	2310682	Seal
20		1	2316246	Piston rear
23	◆★	1	9974166	O-ring
24	◆★	1	2303437	O-ring
25		1	2325291	Sealing nut
26		1	2325294	Air valve washer
		1	2326335	GM 5000EA service set

◆ = Wear part

★ = Included in service set

10.3 ACCESSORIES SPARE PARTS LISTS

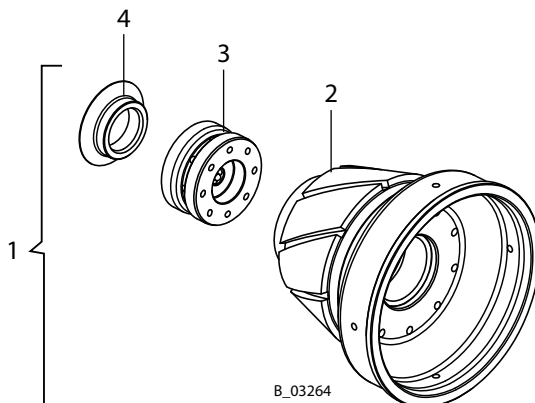
10.3.1 AR 5000 (D8) NOZZLE SPARE PARTS LIST



AR 5000 (D8) nozzle spare parts list				
Item	K	Quantity	Part No.	Description
1		1	2310558	AR 5000 nozzle, compl. (D8)
2		1	2327658	AR nozzle (D8)
3	◆	1	2327659	AR nozzle cap (D8)
4	◆	1	2327660	AR air manifold (D8)

◆ = Wear part

10.3.2 AR 5000 (D12) NOZZLE SPARE PARTS LIST

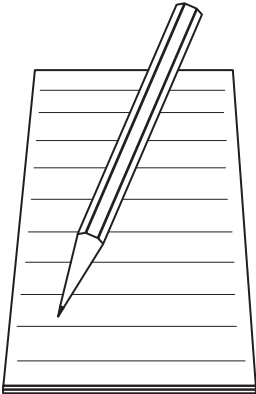


AR 5000 (D12) nozzle spare parts list				
Item	K	Quantity	Part No.	Description
1		1	2315050	AR 5000 nozzle, compl. (D12)
2		1	2327661	AR nozzle (D12)
3	◆	1	2327662	AR nozzle cap (D12)
4	◆	1	2327663	AR air manifold (D12)

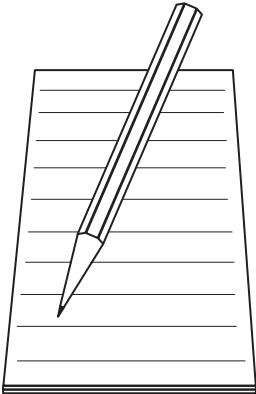
◆ = Wear part

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OPERATING MANUAL

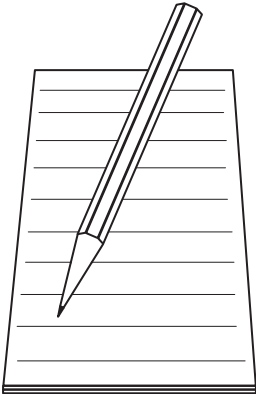


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OPERATING MANUAL



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