

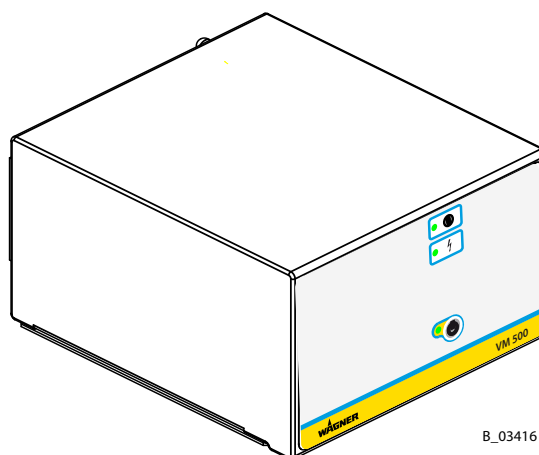


Translation of the Original Operating Manual

For professional use.
Always follow the information in this manual,
particularly the safety instructions and the warning
instructions. Store the manual in a safe place.

Version 09/2018

VM 500 Control Unit for Electrostatic Manual Spray Guns



B_03416

CE  II 3(2) G

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1 ABOUT THESE INSTRUCTIONS

1.1 PREFACE

The operating manual contains information about safely operating, maintaining, cleaning and repairing the device.


The operating manual is part of the device and must be available to the operating and service personnel.


The device may only be operated by trained personnel and in compliance with this operating manual.


Operating and service personnel should be instructed according to the safety instructions. This equipment can be dangerous if it is not operated according to the instructions in this operating manual.


1.2 WARNINGS, NOTICES AND SYMBOLS IN THESE INSTRUCTIONS

Warning instructions in this manual highlight particular dangers to users and to the device and state measures for avoiding the hazard. These warning instructions fall into the following categories:

 **DANGER** Immediate risk of danger.
Non-observance will result in death or serious injury.

 **WARNING** Potential risk.
Non-observance can result in death or serious injury.

 **CAUTION** Potentially hazardous situation.
Non-observance may result in minor injury.

 **NOTICE** Potentially hazardous situation.
Non-observance may result in damage to property.

Note: Provides information about particular characteristics and how to proceed.

Explanation of warning notice:

LEVEL OF DANGER

This notice warns you of a hazard!

Possible consequences of not observing the warning notice.

→ The measures for preventing the hazard and its consequences.



1.3 LANGUAGES

The operating manual is available in the following languages:

Original operating manual

Language	Order no.
German	2310485

Translation of the original operating manual

Language	Order no.
English	2318724
French	2318725
Italian	2318726
Spanish	2318728

Additional languages on request or at: www.wagner-group.com

1.4 ABBREVIATIONS

Stk	Number of pieces
Pos	Position
K	Marking in the spare parts lists
Order no.	Order number

ET	Spare part
SSt	Stainless steel
2K	Two components
VM	Voltage Module

1.5 TERMINOLOGY FOR THE PURPOSE OF THIS MANUAL

Cleaning	
Cleaning	Manual cleaning of devices and device parts with cleaning agent
Flushing	Internal flushing of paint-wetted parts with flushing agent
Personnel qualifications	
Trained person	Is instructed in the tasks assigned to him/her, the potential risks associated with improper behavior as well as the necessary protective devices and measures.
Electrically trained person	Is instructed by an electrician about the tasks assigned to him/her, the potential risks associated with improper behavior as well as the necessary protective devices and measures.
Electrician	Can assess the work assigned to him/her and detect possible hazards based on his/her technical training, knowledge and experience in relevant provisions.
Skilled person in the context of DGUV 209-052	A person who, based on his/her technical training, experience and recent vocational experience, has sufficient technical knowledge in the area of electrostatic coating and is familiar with the relevant and generally accepted rules of technology so that he/she can inspect and assess the status of devices and coating systems based on workplace safety. → Additional requirements for skilled persons can also be found in TRBS 1203 (2010/amendment 2012): Expert knowledge in the areas of protection against excessive pressure, electrical hazards, and explosion protection (where applicable).

2 CORRECT USE

2.1 DEVICE TYPE

VM 500 control unit for controlling GM 5000EA or GM 5000EAC electrostatic spray guns.

2.2 TYPE OF USE

WAGNER's VM 500 electrostatic control unit controls and regulates the high-voltage supply to the GM 5000EA or GM 5000 EAC spray guns used to apply liquid coating media.

The VM 500 may only be operated together with the above-mentioned manual spray guns. If the control unit is operated in combination with devices other than the above-mentioned spray guns, the SIRA authorization (type approval) ceases to be valid.

These electrostatic manual spray guns are suitable for spraying liquid products, in particular coating products that follow AirCoat or Airspray techniques. Coating products containing solvents of explosion class II A may be used.

WAGNER forbids any other use!

- Use the device only to work with the products recommended by WAGNER.
- Do not deactivate safety fixtures.
- Use only WAGNER original spare parts and accessories.
- The operating personnel must be trained on the basis of this operating manual.
- Follow the instructions in the operating manual.

The control unit may only be operated if all parameters are set and all measurements/safety checks have been carried out correctly.

2.3 FOR USE IN POTENTIALLY EXPLOSIVE AREAS

The control unit is designed, together with the spray gun, in accordance with the 2014/34/EU (ATEX) directive. The spray gun is suitable for use in the potentially explosive area of zone 1 and the control unit in the zone 2 area.
(See Chapter 3: Explosion Protection Identification.)

IP code IP54 is only guaranteed if all sealed elements in the control unit are present and undamaged. During operation, all electric connections of the control unit have to be tightly sealed with the corresponding plug connectors or closing elements.



2.4 MISUSE

Misuse can lead to physical injury and/or property damage!
Special attention must be paid that:

- no dry coating products, e.g. powder are processed;
- no food, medicine or cosmetics are processed.

3 IDENTIFICATION

3.1 EXPLOSION PROTECTION IDENTIFICATION

The control unit is designed, together with the spray gun, in accordance with the 2014/34/EU (ATEX) directive. The spray gun is suitable for use in the potentially explosive area of zone 1 and the control unit in the zone 2 area.

Device type: VM 500 control unit
 Manufacturer: Wagner International AG
 9450 Altstätten
 Switzerland



CE₀₁₀₂ II 3(2) G

SIRA 11 ATEX 5374X

CE European Communities
 0102 Notified body: PTB
 Ex Explosion-proof equipment
 II Device class II (not mining)
 3 Category 3 device (suitable for zone 2)
 (2) Effective in zone 1
 G Ex-atmosphere gas
 SIRA 11 ATEX 5374X Number of type examination certificate
 "X": see Chapter 3.2.



3.2 IDENTIFICATION "X"

Notice

The EU-type examination certificate from SIRA covers the use of the control unit as related equipment for the spray gun. The manufacturer certifies that the control unit can be used in zone 2.

Cable connections

Only the corresponding cables for the device may be used (see Chapter 12 and the spray gun's operating manual).

Permissible device combinations

The following spray guns may be connected to the VM 500 control unit:

- GM 5000EA spray gun
- GM 5000EAC spray gun

3.3 USE IN AREAS SUBJECT TO EXPLOSION HAZARDS

Surface spraying, electrostatics

→ Never spray device parts using electrostatic equipment (electrostatic spray gun)!



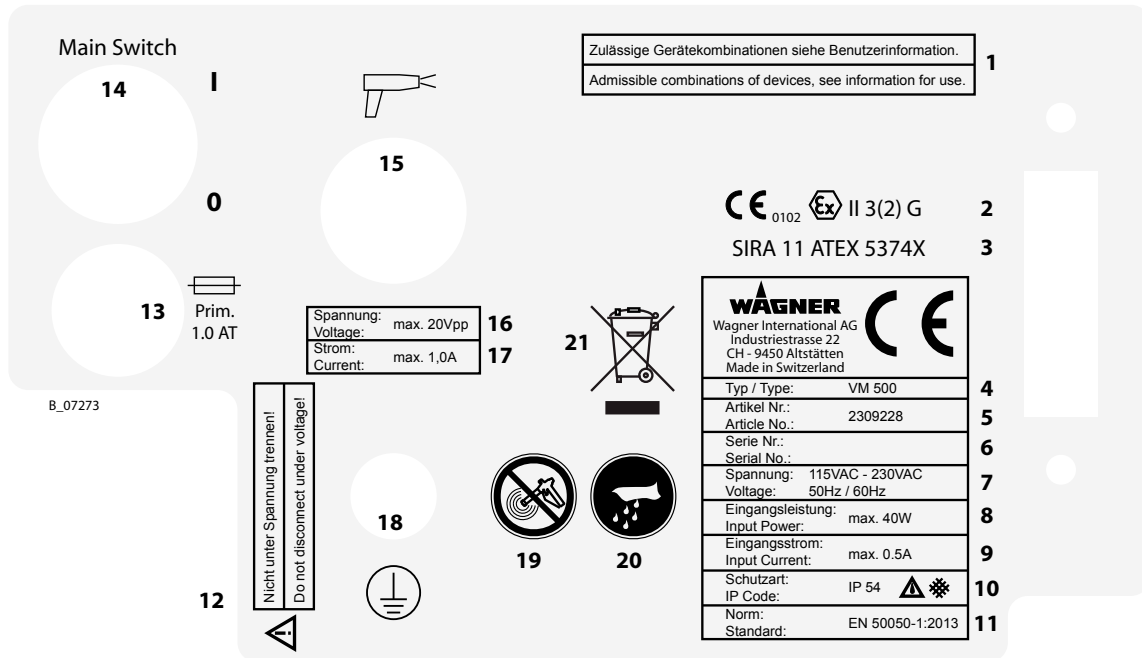
Cleaning

If there are deposits on the surfaces, the device may form electrostatic charges. Flames or sparks can form during discharge.

→ Remove deposits from the surfaces to maintain conductivity.
 → Use only a damp cloth to clean the device.



3.4 TYPE PLATE



Pos	Designation
1	For permissible device combinations, see user information.
2	Identification
3	Test center
4	Device type
5	Article number
6	Serial number
7	Input voltage
8	Input power
9	Input current
10	Protection class
11	Standard
12	Do not disconnect under voltage!
13	Primary fuse 1.0 ampere, slow-acting
14	Mains supply switch
15	Spray gun connection
16	Maximum voltage
17	Maximum current
18	Grounding
19	Never spray device parts using electrostatic equipment (electrostatic spray gun)!
20	Use only a damp cloth to clean the device. Remove deposits from the surfaces.
21	Do not dispose of used electrical equipment with household refuse.

4 BASIC SAFETY INSTRUCTIONS

4.1 SAFETY INSTRUCTIONS FOR THE OPERATOR

- Keep this operating manual at hand near the device at all times.
- Always follow local regulations concerning occupational safety and accident prevention.



4.1.1 ELECTRICAL DEVICES AND EQUIPMENT

Electric shock hazard!

Danger to life from electric shock

- Prepare device 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. With open housings, the mains voltage poses a danger.
- Operate device in accordance with the safety regulations and electrotechnical regulations.
- Must be repaired immediately in the event of problems.
- Decommission if it poses a hazard or is damaged.
- Must be de-energized before work is commenced. Inform personnel about planned work. Observe electrical safety regulations.
- Ground all devices to a common grounding point.
- Only operate the device with a properly installed socket with a protective ground wire connection.
- Keep liquids away from electrical devices.



4.1.2 A SAFE WORK ENVIRONMENT

Hazard due to dangerous fluids or vapors!

Severe or fatal injuries due to explosion hazard or inhalation, swallowing or contact with the skin or eyes.

- Ensure that the floor in the working area is static dissipative in accordance with EN 61340-4-1 (resistance must not exceed 100 MΩ).
- Paint mist extraction systems/ventilation systems must be fitted on site according to local regulations.
- Make sure that the ground connection and potential equalization of all system parts are reliable and continuous and can withstand the expected stress (e.g. mechanical stress, corrosion).
- Ensure that product hoses/air hoses adapted to the working pressure are used.
- Ensure that personal protective equipment (see Chapter 4.2.1) is available and is used.
- Ensure that all persons within the working area wear static dissipative shoes. Footwear must comply with EN 20344. The measured insulation resistance must not exceed 100 MΩ.
- Ensure that during spraying, persons wear static dissipative gloves. The grounding takes place via the spray gun handle or the trigger.
- Protective clothing, including gloves, must comply with EN 1149-5. The measured insulation resistance must not exceed 100 MΩ.



- Ensure that there are no ignition sources such as naked flames, sparks, glowing wires, or hot surfaces in the vicinity. No smoking.
- Ensure that the pipe joints, hoses, equipment parts and connections are permanently, technically leak-proof:
 - Periodic preventative maintenance and service (replacing hoses, checking tightness of connections, etc.).
 - Regular monitoring of leaks and defects via visual inspection and odor testing, e.g., daily before commissioning, at the end of work or weekly.
- Ensure that maintenance and safety checks are performed regularly.
- In the event of defects, immediately bring the device or system to a stop and arrange to have repairs carried out immediately.

4.1.3 PERSONNEL QUALIFICATIONS

Hazard due to incorrect use of device!

Risk of death due to untrained personnel.

- Ensure that the operating personnel has been instructed by the operator in accordance with the operating manual and the operating instructions. The device must only be operated, maintained and repaired by trained personnel. Refer to the operating instructions for information about the required personnel qualifications.

4.2 SAFETY INSTRUCTIONS FOR THE PERSONNEL

- Always follow the information in this manual, particularly the safety instructions and the warning instructions.
- Always follow local regulations concerning occupational safety and accident prevention.
- In electrostatics applications: anyone who belongs to a risk group according to EMF Directive 2013/35/EU (e.g., those with active implants), must not enter the high-voltage area.



4.2.1 PERSONAL SAFETY EQUIPMENT

Hazard due to dangerous fluids or vapors!

Serious or fatal injuries due to inhalation, swallowing or contact with the skin or eyes.

- When preparing or working with lacquer and when cleaning the device, follow the working instructions of the manufacturer of the lacquers, 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 device in a spray booth or on a spraying wall with the ventilation (extraction) switched on.
- Wear suitable protective clothing when working with hot products.



4.2.2 SAFE HANDLING OF WAGNER SPRAY DEVICES

Hazard due to injection of lacquer or flushing agent into the skin!

The spray jet is under pressure and can cause dangerous injuries. Avoid injection of lacquer or flushing agents:

- Never point the spray gun at people.
- Never reach into the spray jet.
- Before any work on the device, in the event of work interruptions and malfunctions:
 - Switch off the energy/compressed air supply.
 - Relieve the pressure from the spray gun and device.
 - Secure the spray gun against actuation.
 - Disconnect the control unit from the mains.
 - In the event of functional faults: remedy the fault as described in the "Troubleshooting" chapter.
- If needed, the liquid ejection devices must be checked by experts (e.g., WAGNER service technician) at least every 12 months for their safe operating condition in accordance with DGUV regulation 100-500 Chapter 2.29 and Chapter 2.36.
 - For shut down devices, the examination can be suspended until the next start-up.



In the event of skin injuries caused by lacquer or flushing agents:

- Note the lacquer or flushing agent that you have been using.
- Consult a doctor immediately.

Danger due to recoil forces!

Actuating the trigger can cause strong recoil forces. Thereby, the user can lose his balance and injure himself when falling.

Avoid risk of injury from recoil forces:

- Ensure that you have firm footing when operating the spray gun.



4.2.3 GROUNDING THE UNIT

Hazard due to electrostatic charge!

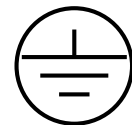
Explosion hazard and damage to the device.

Friction, flowing liquids and air or electrostatic coating processes create charges.

Flames or sparks can form during discharge.

Correct grounding of the entire spraying system prevents electrostatic charges.

- Ensure that all devices and tanks are grounded before each spraying process.
- Ground the work pieces to be coated.
- Ensure that all persons inside the working area are grounded, e.g., that they are wearing static dissipative shoes.
- Wear static dissipative gloves when spraying. The grounding takes place via the spray gun handle or the trigger.

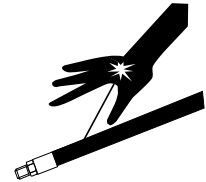


4.2.4 PRODUCT HOSES

Hazard due to bursting of product hose!

The product hose is under pressure and may cause dangerous injuries.

- Ensure that the hose material is chemically resistant to the sprayed products and the flushing agents used.
- Ensure that the product hose and the fittings are suitable for the pressure generated.
- Ensure that the following information can be seen on the high-pressure hose:
 - manufacturer,
 - permissible operating pressure,
 - date of manufacture.
- Make sure that the hoses are laid only in suitable places. Hoses should not be laid in the following places under any circumstances:
 - in high-traffic areas,
 - on sharp edges,
 - on moving parts or
 - on hot surfaces.
- Ensure that the hoses are never run over by vehicles (e.g., fork lift trucks), or that the hoses are never put under pressure from the outside in any other way.
- Ensure that the hoses are never kinked. Observe maximum bending radii.
- Ensure that no work is ever performed with a damaged hose.
- Make sure that the hoses are never used to pull or move the equipment.
- The electrical resistance of the product hose, measured at both valves, must be less than 1 MΩ.
- Suction hoses may not be subjected to pressure.



4.2.5 CLEANING AND FLUSHING

Hazard due to cleaning and flushing!

Explosion hazard and damage to the device.

- Preference should be given to non-ignitable cleaning and flushing agents.
- When carrying out cleaning work with flammable cleaning agents, make sure that all equipment and resources (e.g., collection tank, funnel, transport cart) are conductive or static dissipative and grounded.
- Observe the specifications of the lacquer manufacturer.
- Ensure that the flash point of the cleaning agent is at least 15 K above the ambient temperature or that cleaning is undertaken at a cleaning station with technical ventilation.
- Never use chloride or halogenated solvents (such as trichloroethane and methylene chloride) with devices containing aluminium or galvanized/zinc-plated parts. They may react chemically thus producing an explosion danger.
- Take measures for workplace safety (see Chapter [4.1.2](#)).
- When commissioning or emptying the device, please note that:
 - depending upon the coating product used,
 - depending on the flushing agent (solvent) used.
 an explosive mixture may temporarily exist inside the lines and components of equipment.
- Only electrically conductive tanks may be used for cleaning and flushing agents.
- The tanks must be grounded.



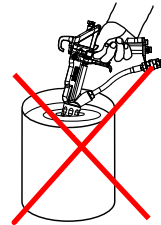
An explosive gas/air mixture forms in closed tanks.

- Never spray into a closed tank when using solvents for flushing.

External Cleaning

When cleaning the exterior of the device or its parts, also observe the following:

- Relieve the pressure from the device.
- De-energize the device electrically.
- Disconnect the pneumatic supply line.
- Use only moistened cloths and brushes. Never use abrasive agents or hard objects, and never spray cleaning agents with a spray gun. Cleaning the device must not damage it in any way.
- Ensure that no electric component is cleaned with or immersed into solvent.



4.2.6 TOUCHING HOT SURFACES

Hazard due to hot surfaces because of hot coating products!

Risk of burn injuries

- Only touch hot surfaces if you are wearing protective gloves.
- When operating the device with a coating product with a temperature of > 43 °C; 109 °F:
 - Identify the device with a warning label "Warning - hot surface".

Order no.

9998910 instruction label

9998911 protection label

Note: Order the two stickers together.



4.2.7 MAINTENANCE AND REPAIR

Hazard due to improper maintenance and repair!

Danger to life and equipment damage.

- Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- Use only WAGNER original spare parts and accessories.
- Do not change or modify the device; if change is necessary, contact WAGNER.
- Only repair and replace parts that are listed in Chapter [12](#) and Chapter [13](#) that are assigned to the unit.
- Do not use any defective components.
- Before all work on the device and in the event of work interruptions:
 - Relieve the pressure from the spray gun, high-pressure hoses and all devices.
 - Secure the spray gun against actuation.
 - Switch off the energy and compressed air supply.
 - Disconnect the control unit from the mains.
- Observe the operating and service manual for all work.

4.2.8 PROTECTIVE AND MONITORING EQUIPMENT

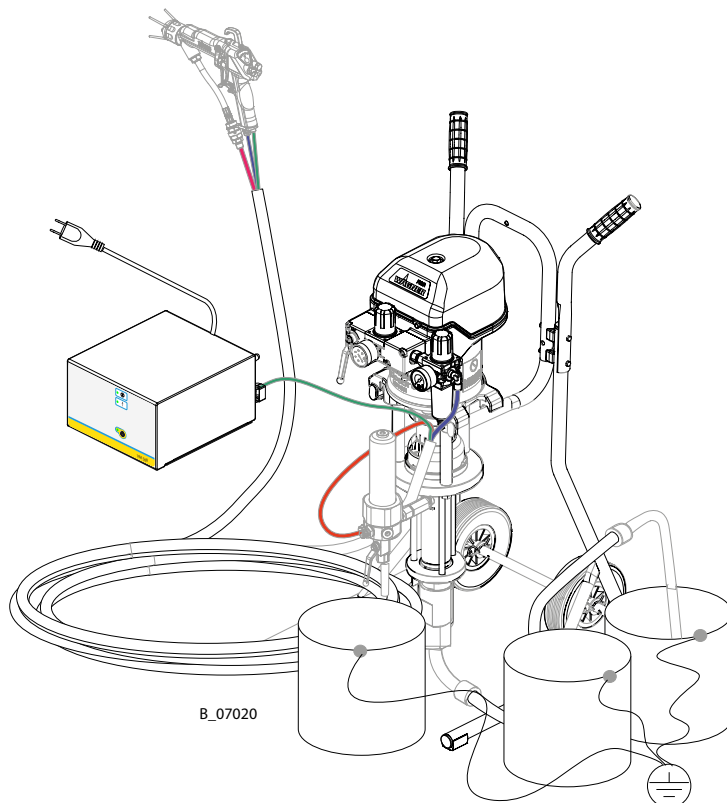
Hazard due to removal of protective and monitoring equipment!

Danger to life and equipment damage.

- Protective and monitoring equipment must not be removed, modified or rendered unusable.
- Regularly check for perfect functioning.
- If defects are detected on protective and monitoring equipment, the system must not be operated until these defects are remedied.

5 DESCRIPTION

5.1 COMPONENTS



The VM 500 control unit, together with the matching GM 5000EA or GM 5000EAC spray gun and other components, form an electrostatic manual spray system.

5.2 MODE OF OPERATION

The VM 500 control unit supplies the control voltage for the spray gun, in which high voltage is subsequently produced. The high-voltage supply is switched on and off via the trigger of the spray gun.

The special linear characteristic for high voltage ensures that, if the spray gun is brought too close to the work piece (or ground), the high voltage is reduced automatically to prevent an accidental spark discharge.

The VM 500 control unit also offers a fault display.

5.3 PROTECTIVE AND MONITORING EQUIPMENT

The following functions are provided for safety:

- Electrical monitoring of high voltage and spray current (maximum ignition energy 0.24 mJ)
→ No ignition danger and no danger to personnel.
- Electrical ground monitoring of the spray gun.

5.4 INCLUDED ITEMS

Stk	Order no.	Designation
1	2310478	VM 500 control unit

5.4.1 STANDARD EQUIPMENT

Stk	Order no.	Designation
1	241270	Mains cable with Stak200; 3 m; 9.8 ft
1	130215	Grounding cable 10 m; 32.8 ft
2	9951117	Slow-acting fuse, 1.0 AT
1	2310487	Declaration of Conformity
1	2310485	VM 500 operating manual, German
1	see Chapter 1.3	Operating manual in local language

For special versions the delivery note applies.

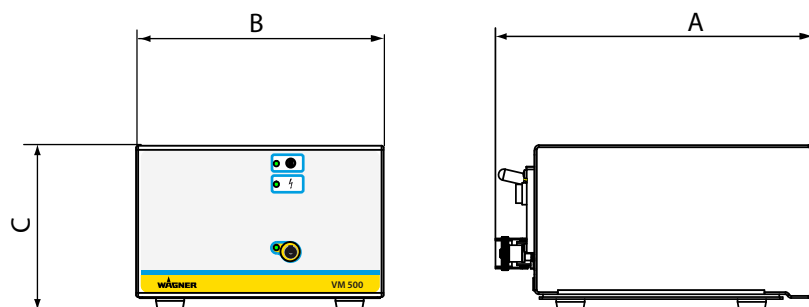
5.5 DATA**5.6 TECHNICAL DATA**

Description	Values
Input voltage	115 VAC - 230 VAC, 50 Hz / 60 Hz
Input power	max. 40 W
Input current	max. 0.5 A
Output voltage	max. 20 Vpp
Output current	max. 1.0 A AC
High-voltage limitation	80 kV DC
Spray current limitation	100 µA DC
Polarity	for negative high-voltage generators
Protection class	IP 54 *
Weight (without cables)	2.3 kg; 5.07 lb
Operating temperature range	0-40 °C; 32-104 °F

* Splash water protection is only guaranteed when the spray gun cable socket is screwed to the device plug and the mains cable socket is fixed to the control unit plug with the safety clip.

5.7 DIMENSIONS

Measurement	mm	inch
A	230	9.06
B	180	7.09
C	120	4.72



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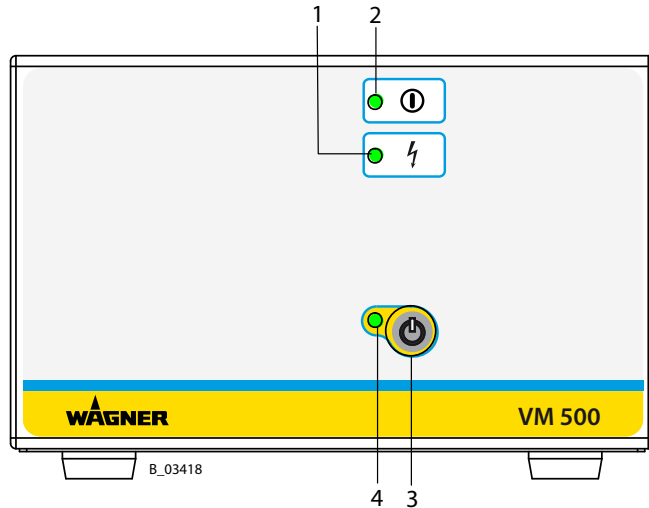
OPERATING MANUAL



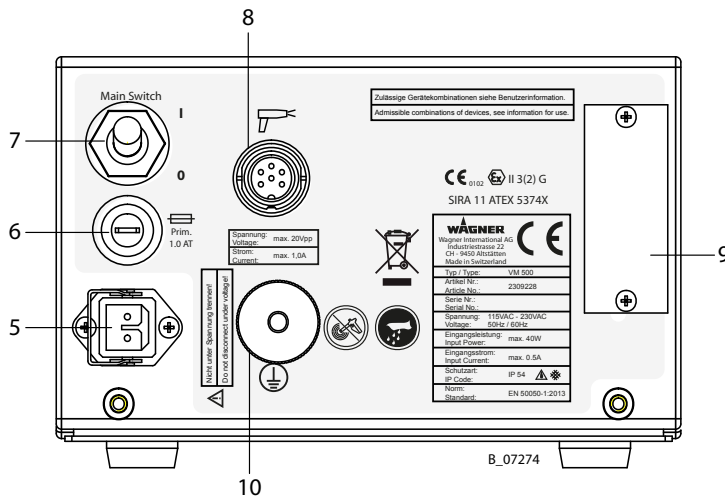
5.8 OPERATING ELEMENTS AND CONNECTIONS

5.8.1 OPERATING ELEMENTS ON FRONT SIDE

Pos	Designation
1	Illuminated display "High voltage"
2	Illuminated display "Operating signal"
3	Push button "Standby mode"
4	Illuminated display "Standby"



5.8.2 CONNECTIONS ON THE REAR SIDE



Pos	Designation
5	Mains input terminal: connection for mains cable with safety clip. Warning - Do not disconnect under voltage.
6	Primary fuse: 1.0 ampere, slow-acting
7	Mains supply switch: 0 = The control unit is deactivated. I = The control unit is activated.
8	Spray gun connection: for connecting a GM 5000EA or GM 5000EAC spray gun. Warning - Do not disconnect under voltage.
9	Service connection cover: only for WAGNER service personnel.
10	Knurled nut grounding: grounding cable connection to the signal ground.

6 COMMISSIONING

6.1 TRAINING OF ASSEMBLY/COMMISSIONING PERSONNEL

- The assembly and commissioning personnel must have the technical skills to safely commission the device.
- When assembling, commissioning and carrying out all work, read and follow the operating manuals and safety regulations for the additionally required system components.

A skilled person must check to ensure that the device is in a reliable state after it is installed and commissioned.

6.2 STORAGE CONDITIONS

Until the point of assembly, the device must be stored in a dry location, free from vibrations and with a minimum of dust. The device must be stored in closed rooms. The air temperature at the storage location must be between -20 °C and 60 °C (-4 °F and 140 °F).

The relative air humidity at the storage location must be between 10 and 95% (without condensation).

6.3 INSTALLATION CONDITIONS

The air temperature at the installation site must be in a range between 0 °C and 40 °C (32 °F and 132 °F).

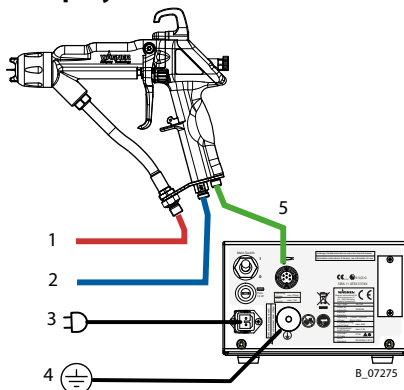
The relative air humidity at the installation site must be between 10 and 95% (without condensation).

6.4 ADDITIONAL COMPONENTS

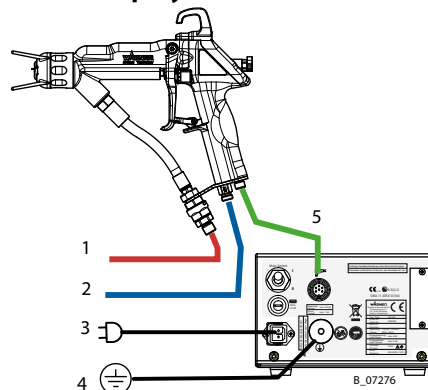
This control unit can be used to complete an electrostatic manual spray system. To do so, a suitable spray gun and the relevant components for the selected spray process are required (see WAGNER accessories).

Spray guns that are compatible with the VM 500:

Air-Spray GM 5000EAR or GM 5000EAF



AirCoat-Spray GM 5000EACR or GM 5000EACF



Pos	Designation
1	For the product supply system
2	For the compressed air supply
3	Mains cable
4	Grounding cable to the signal ground
5	Spray gun cable

6.5 LOCATION OF THE CONTROL UNIT

DANGER

Incorrect installation of the device!

Explosion hazard and damage to the device.

- Set up the device outside the spray booth/spray zone.
- If possible, set up the device outside the Ex zone (Ex zone 2 is permissible).
- Protect the device from significant temperature and moisture changes.
- Protect the device from contamination.
- Lay and fix the connecting cable correctly.
- Ensure that the local mains voltage and tension of the device match.



WARNING

Sparks form when live components are separated or connected!

Explosion hazard from electric sparks.

- Do not disconnect plug connections under voltage.
- Do not open fuse holders under voltage.
- Do not remove the service plug cover under voltage.



All sealed elements on the control unit must be present and undamaged. During operation, all electric connections of the control unit have to be tightly sealed with the corresponding plug connectors or closing elements. While under voltage, neither plug connectors nor closing elements may be separated or opened.

6.6 GROUNDING

Perfect grounding of all conductive parts such as floors, walls, roofs, barriers, work pieces, transport devices, coating product tank, coating product supply or construction parts in the spray area with exception of the high-voltage parts during normal operation is important for optimum coating and safety.

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

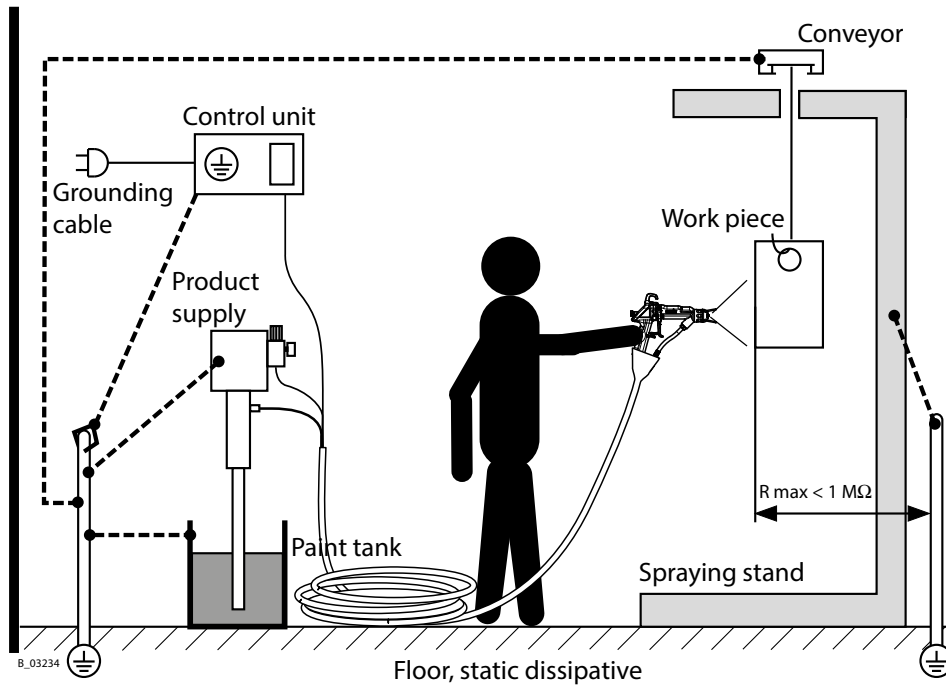
A poorly grounded work piece causes:

- very bad wrap around
- uneven coating
- back spraying to the spray gun (contamination) and coater

Prerequisites for perfect grounding and coating are:

- Clean suspension for the workpiece to be coated.
- Grounding of spray booth, conveyor system and suspension equipment on the building side in accordance with the operating manuals or the manufacturer's information.
- Grounding of all conductive parts within the working area.
- The grounding resistance of the work piece may not exceed 1 M Ω (megohm). (Ground leakage resistance measured at 500 V or 1000 V)
- Connect the control unit to the signal ground.
- Connect all grounding cables using a short and direct route.
- Safety shoes and gloves, if used, must be static dissipative.

Grounding scheme (example)



Minimum cable cross-section	
Control unit	4 mm ² / AWG 12
Product supply	
Paint tank	
Conveyor	16 mm ² / AWG 6
Booth	
Spraying stand	

Grounding of spray gun

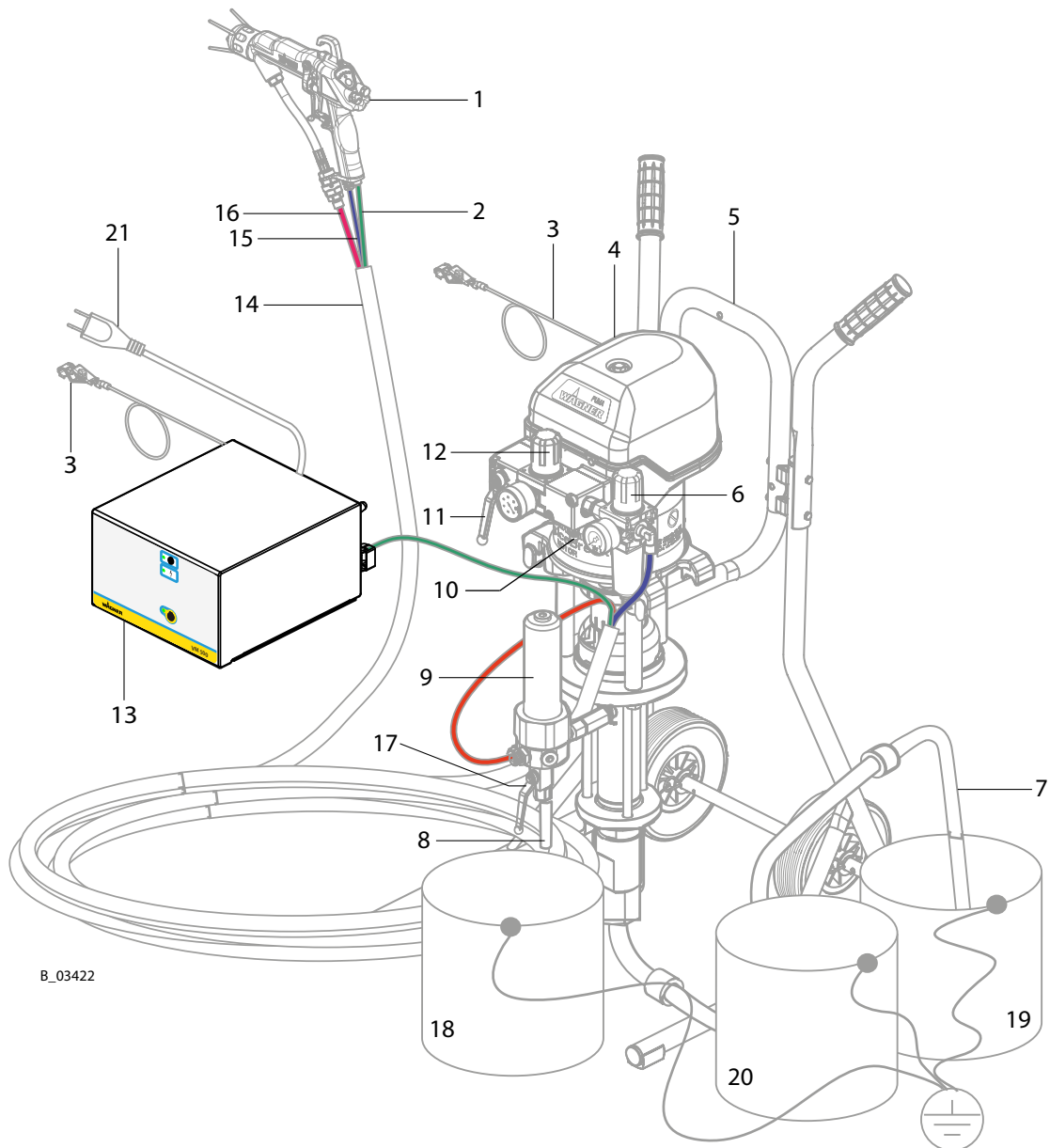
The spray gun is grounded via the spray gun cable.

- The GM 5000EA and/or GM 5000EAC spray gun must be connected to the VM 500 control unit via the spray gun cable.

Notice for the coater

Safety shoes and gloves, if used, must be static dissipative.

6.7 EXAMPLE AIRCOAT SPRAYING SYSTEM



B_03422

Pos	Designation
1	GM 5000EACF spray gun
2	Spray gun cable
3	Grounding cable
4	Pneumatic pump
5	Sliding tables
6	Air pressure regulator + air filter
7	Product suction system

Pos	Designation
8	Return hose
9	High-pressure filter
10	Compressed air connection
11	Stop valve
12	Air pressure regulator
13	VM 500 control unit
14	Protective hose

Pos	Designation
15	Air hose
16	Product hose
17	Return valve
18	Tank for return flow
19	Paint tank
20	Tank for flushing agent
21	Mains cable

The following points should be noted before commissioning:

- Lay grounding cable from the grounding screw on the device to the signal ground and ensure that all other conductive parts within the working area are grounded.
- Connect the VM 500 electrostatic control unit via the mains cable to the socket interlocked with the extraction system.
- Connect the spray gun cable to the connector socket and screw into place.
- Connect the spray gun to the adjustable, clean air supply.
For compressed air quality, see operating manual for spray gun.
- Connect the GM 5000EA or GM 5000EAC to the paint supply as described in the relevant operating manuals.
- Check that all product-conveying connections are correctly connected.
- Check that all air-conveying connections are correctly connected.
- Visually check the permissible pressures for all the system components.
- Check the level of the separating agent in the pump and fill up if necessary.
- Provide product tank, tanks for flushing agent and an empty tank for return flow.
- The interface input on the rear side of the control unit has to be protected by the cover.
- Connect the system to the air supply.
- When first commissioning the unit → Flush the system in accordance with the operating manuals for the other components.

6.8 VENTILATION OF THE SPRAY BOOTH

The electrostatic spraying equipment may only be operated in defined spraying areas and in accordance with the EN 12215 standard or under comparable ventilation conditions. The electrostatic spraying equipment must be locked to the technical ventilation so that the coating product 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 product (overspray) will be collected up safely.

6.9 VERIFYING A SAFE OPERATIONAL CONDITION

A skilled person must check to ensure that the device and the spraying system are in a safe state after they are installed and commissioned.

7 OPERATION

7.1 TRAINING THE OPERATING PERSONNEL

- The operating personnel must be qualified to operate the entire system.
- The operating staff must be familiar with the potential risks associated with improper behavior as well as the necessary protective devices and measures.
- Before work commences, the operating personnel must receive appropriate system training.

7.2 TASKS

⚠ DANGER

High-voltage field!

Danger to life from malfunction of heart pacemakers.

Make sure that persons with pacemakers:

- do not work with the electrostatic spray gun,
- don't stay inside the area of the electrostatic spray gun/work piece.



Ensure that:

- the control unit is not opened,
- the regular safety checks are carried out in accordance with Chapter [8.2.3](#),
- commissioning is carried out in accordance with Chapter [6](#).

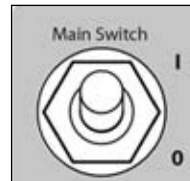
7.2.1 EMERGENCY DEACTIVATION

In the case of unforeseen occurrences, proceed as follows:

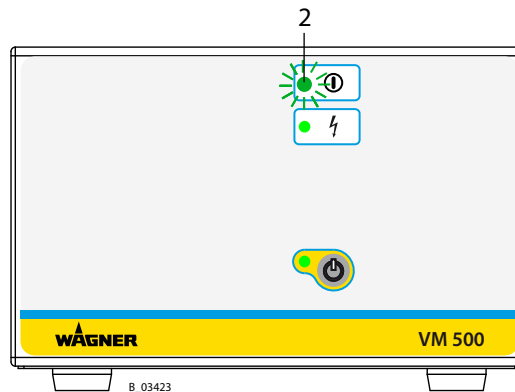
1. Switch off control unit.
2. Close the compressed air supply.
3. Relieve pressure according to the operating manual of the product pressure generator.
4. Point the spray gun toward the grounded collecting tray.
5. Pull the trigger of the spray gun until no further pressure is present.

7.3 STARTING UP AND SPRAYING

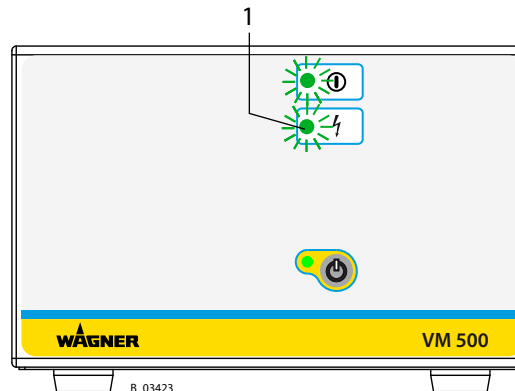
1. Set main switch to position I.
For approx. 1 second, all LEDs light up
→ Display test



2. If the operating signal light (2) is green after the display test, the control unit is ready to be operated.



3. When the spray gun trigger is pulled, high voltage is switched on. This is indicated by the high-voltage LED (1).

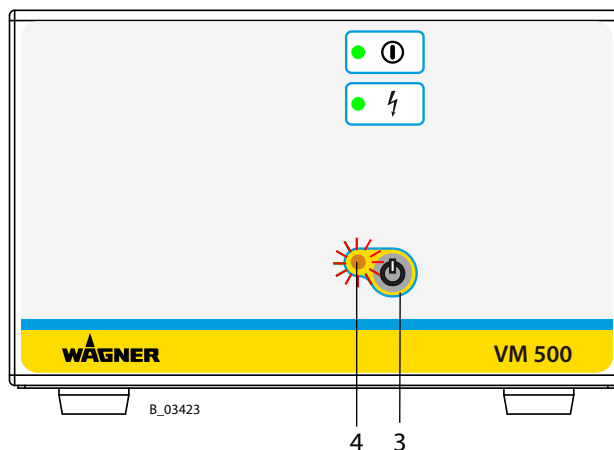


7.4 STANDBY MODE

1. If you want to spray without high voltage, select the standby mode. Press push button (3) briefly and the Standby illuminated display (4) lights up.

Note:

This function can be activated and used from the spray gun.



8 CLEANING AND MAINTENANCE

8.1 CLEANING

8.1.1 CLEANING PERSONNEL

Cleaning work should be undertaken regularly and carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during cleaning work:

- risk to health from inhaling solvent vapors,
- use of unsuitable cleaning tools and aids.

⚠ DANGER

Cleaning the control unit!

If there are deposits on the surfaces, the device may form electrostatic charges. Flames or sparks can form during discharge.

- Remove deposits from the surfaces to maintain conductivity.
- Use only a damp cloth to clean the device.
- Do not clean control unit with solvent or immerse it in solvent.



8.2 MAINTENANCE

8.2.1 MAINTENANCE PERSONNEL

Maintenance work should be undertaken regularly and carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during maintenance work:

- risk to health from inhaling solvent vapors,
- use of unsuitable tools and aids.

An authorized person must ensure that the device is checked for being in a reliable state after maintenance work is completed.

8.2.2 MAINTENANCE INSTRUCTIONS

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- Use only WAGNER original spare parts and accessories.
- Only repair and replace parts that are listed in the "Spare parts" chapter and that are assigned to the unit.
- Before all work on the device and in the event of work interruptions:
 - Relieve the pressure from the spray gun, high-pressure hoses and all devices.
 - Secure the spray gun against actuation.
 - Switch off the energy and compressed air supply.
 - Disconnect the control unit from the mains.
- Observe the operating and service manual for all work.



Prior to Maintenance

- Flush and clean the system.

After maintenance

- Carry out safety checks in accordance with Chapter [8.2.3](#).
- Put the system into operation and check for leaks as described in Chapter [6.9](#).
- Have the system checked for safe condition by an authorized person.
- In accordance with DGUV 100-500 Chapters 2.29 and 2.36:
 - The liquid ejection devices should be checked by an expert (e.g., WAGNER service technician) for their safe working conditions as required and at minimum every 12 months.
 - For shut down devices, the examination can be suspended until the next start-up.

8.2.3 SAFETY CHECKS AND MAINTENANCE INTERVALS

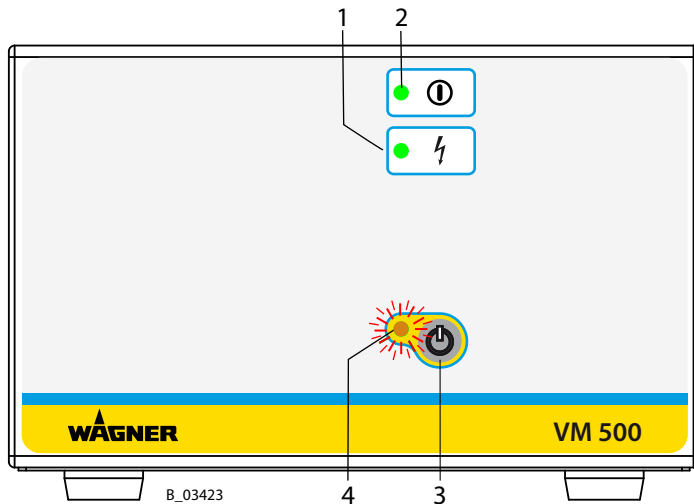
For the safe operation of stationary electrostatic spraying equipment for ignitable liquid coating products, intervals for periodical inspections are defined as follows:

Inspection point	Inspection interval	Remarks
Spray gun cleaning/flushing	daily	Spray gun operating manual
Hoses, tubes, couplings	daily	
Grounding measures	weekly	Chapter 4.2.3 , Chapter 6.6
Inspection for damage	weekly	Chapter 8 , Chapter 9
Locking of the technical ventilation with the electrostatic spraying equipment	annually	Chapter 6.8

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

Damaged devices must be decommissioned and repaired immediately. The functionality and completeness of the control unit must be checked regularly. All sealed elements on the control unit must be present and undamaged. During operation, all electric connections of the control unit have to be tightly sealed with the corresponding plug connectors or closing elements.

9 TROUBLESHOOTING AND RECTIFICATION



Functional fault	Cause	Remedy
Green illuminated display (2) does not light up.	Mains supply not switched on.	Check and switch on mains supply.
	Fuses defective.	Replace fuses.
No illuminated display lights up		WAGNER service department.
Green illuminated display (1) does not light up, no high voltage.	Spray gun cable not connected or defective.	Connect spray gun cable. WAGNER service department.
	Spray gun not connected or defective.	
Green illuminated display (1) always lit up.	Spray gun or control unit defective.	WAGNER service department.
Green illuminated display (1) lights up, no high voltage.	Excessive conductivity of the lacquer.	See operating manual of spray gun

10 REPAIR WORK

10.1 REPAIR PERSONNEL

Repair work should be undertaken carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during repair work:

- risk to health from inhaling solvent vapors,
- use of unsuitable tools and aids.

A skilled person must check to ensure that the device is in a reliable state after it is repaired.

10.2 REPAIR NOTES

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- Use only WAGNER original spare parts and accessories.
- Only repair and replace parts that are listed in the "Spare parts" chapter and that are assigned to the unit.
- Before all work on the device and in the event of work interruptions:
 - Relieve the pressure from the spray gun, high-pressure hoses and all devices.
 - Secure the spray gun against actuation.
 - Switch off the energy and compressed air supply.
 - Disconnect the control unit from the mains.
- Observe the operating and service manual for all work.



Before Repair Work

- Flush and clean system in accordance with the operating manuals of the spray gun or the system.

After Repair Work

- Carry out safety checks in accordance with Chapter [8.2.3](#).
- Put the system into operation and check for leaks as described in Chapter [6.9](#).
- Perform function test.
- In accordance with DGUV 100-500 Chapters 2.29 and 2.36:
 - The liquid ejection devices should be checked by an expert (e.g., WAGNER service technician) for their safe operating conditions as required and at minimum, every 12 months.
 - For shut down devices, the examination can be suspended until the next start-up.

11 DISPOSAL

When the devices must be scrapped, please differentiate the disposal of the waste materials.

The following materials have been used:

- Stainless steel
- Aluminum
- Elastomers
- Plastic
- Carbide

The consumable products (lacquers, adhesives, solvents) must be disposed of in accordance with the applicable specific standards.

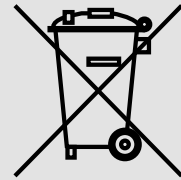
NOTICE

Do not dispose of used electrical equipment with household refuse!


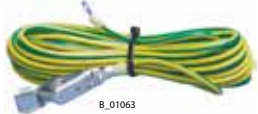

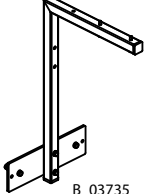
Risk of injury and damage to the device.

In accordance with European Directive 2012/19/EU on the disposal of used electrical equipment and its implementation in national law, this product may not be disposed of with the household refuse, but must be recycled in an environmentally correct manner.

WAGNER or one of our dealers will take back your used WAGNER electric or electronic equipment and will dispose of it for you in an environmentally-friendly way. To arrange this, please contact one of our service centers, one of our representatives or us directly.

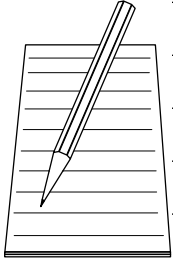


12 ACCESSORIES

Order no.	Designation	
241270 2330628 241271 264626 264625	Mains cable for Europe 3 m; 9.8 ft Mains cable for Europe 10 m; 32.8 ft Mains cable for Switzerland 3 m; 9.8 ft Mains cable for USA 2 m; 6.6 ft Mains cable for Japan 3 m; 9.8 ft	 B_01065
130215	Grounding cable 10 m; 32.8 ft	 B_01063
264332	Grounding cable connection 0.75 m; 2.5 ft	 B_01064
2327509	Mounting bracket for control unit, complete	 B_03735

Hose set and spray gun cable

→ see spray gun operating manual.



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13 SPARE PARTS

13.1 HOW CAN SPARE PARTS BE ORDERED?

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

Order number, designation and quantity

The quantity need not be the same as the number given in the quantity column "Stk" on the list. This number merely indicates how many of the respective parts are used in each component.

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 (normal mail, express delivery, air freight, courier etc.)

Identification in spare parts lists

Explanation of column "K" (labeling) in the following spare parts lists:

- ◆ Wearing parts. Wearing parts are not included in the warranty terms.
- ★ Included in service set

Notice

These parts are not covered by warranty terms.

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

Explanation of order no. column

- Item not available as spare part.
- / Position does not exist.

DANGER

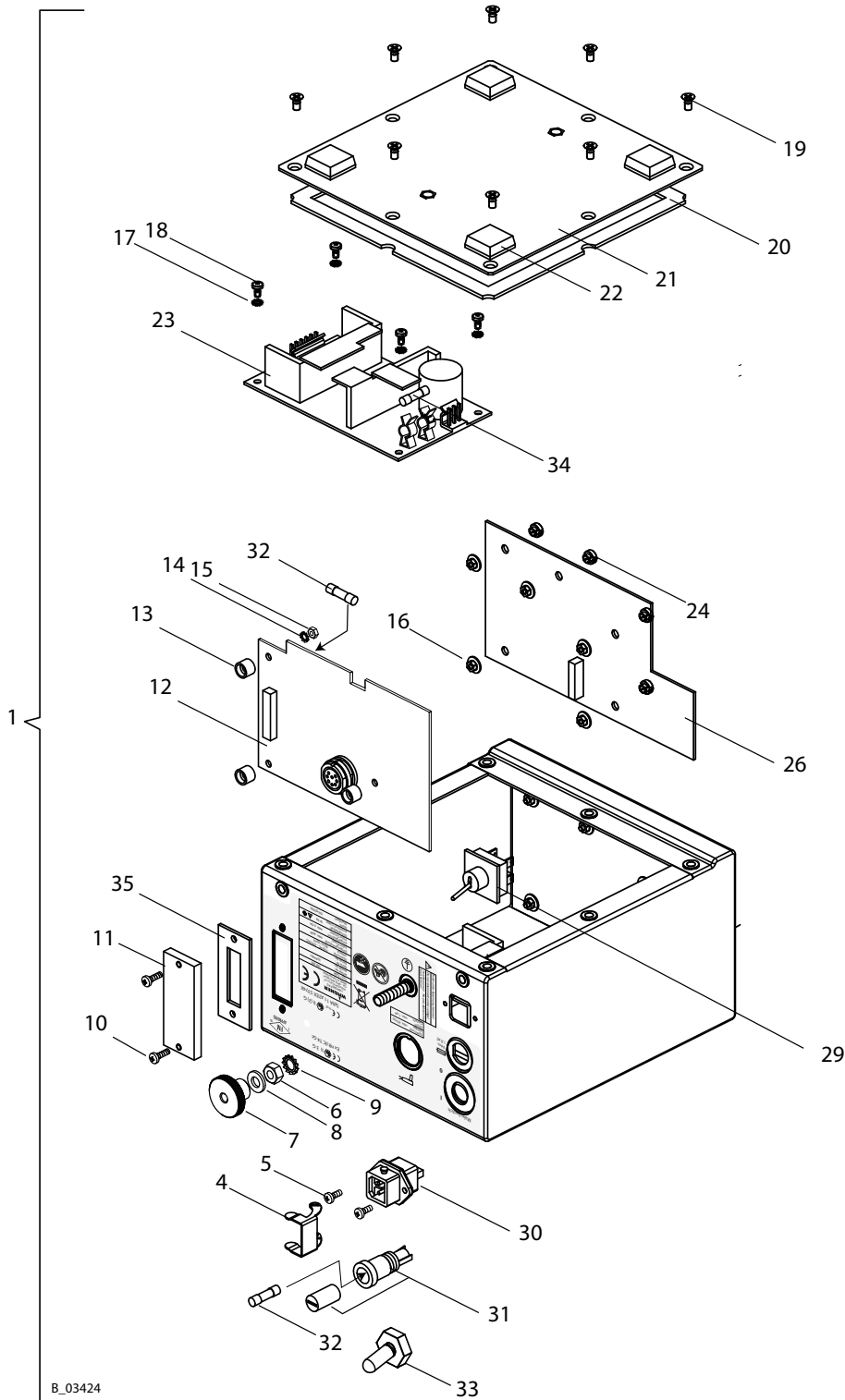
Incorrect maintenance/repair!

Danger to life and equipment damage.

- Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- Use only WAGNER original spare parts and accessories.
- Only repair and replace parts that are listed in the "Spare parts" chapter and that are assigned to the unit.
- Before all work on the device and in the event of work interruptions:
 - Relieve the pressure from the spray gun, high-pressure hoses and all devices.
 - Secure the spray gun against actuation.
 - Switch off the energy and compressed air supply.
 - Disconnect the control unit from the mains.
- Observe the operating and service manual for all work.



13.2 SPARE PARTS LIST FOR VM 500 CONTROL UNIT



B_03424

Pos	Stk	Order no.	Designation
1	1	2310478	VM 500 control unit
4	1	9950330	Safety clip for device sockets
5	2	9903306	Recessed head raised fillister head screw, H form
6	1	9910102	Hexagon nut
7	1	9910522	High knurled nut
8	1	9920118	Washer
9	1	9922017	Serrated lock washer, externally toothed
10	2	9903311	Recessed head raised fillister head screw, H form
11	1	241323	Cover, white
12	1	2317597	Print, complete for VM 500 ET
13	3	263400	Distance bush
14	3	9922011	Serrated lock washer, externally toothed
15	3	9910103	Hexagon nut
16	5	2312348	Hexagon lock nut
17	4	9922011	Serrated lock washer, externally toothed
18	4	9903312	Recessed head raised fillister head screw, H form
19	8	2306405	Recessed countersunk flat head screw, Z form
20	1	2307315	Seal
21	1	2307309	Cover
22	4	9990839	Buffer
23	1	9955176	Switching power supply
24	5	2309112	Spacer
26	1	2317598	Print, complete for VM 500 display
29	1	9953536	Toggle switch, 2-pin
30	1	9952587	Connector plug
31	1	9955021	Fuse socket
32	2	9951117	Slow-acting fuse 1.0 AT
33	1	9971519	Rubber seal
34	1	9955601	Fast-acting fuse, 2.5 A
35	1	2325264	Seal

14 EU DECLARATION OF CONFORMITY

EU Declaration of Conformity as defined by ATEX-directive 2014/34/EU.

Herewith we declare that the supplied version of

Electrostatic spraying system		
VM 500 GM 5000EA GM 5000EAC	VM 5000 GM 5000EA GM 5000EAC	VM 5000 GA 5000EA GA 5000EAC

complies with the following guidelines:

2014/34/EU	2006/42/EC
2014/30/EU	2011/65/EU
2012/19/EU	--

Applied standards, in particular:

EN ISO 12100:2010	EN 50176:2009
EN 1953:2013	EN 61000-6-2:2005+B:2011
EN 60204-1:2006+A1:2009+B:2010	EN 61000-6-4:2007+A1:2011
EN 60529:1991+A1:2000+A2:2013	EN ISO/IEC 80079-34:2011
EN 50050-1:2013	--

Applied national technical standards and specifications, in particular:

DGUV-I 209-052

EC Type Examination Certificate:

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

Identification:

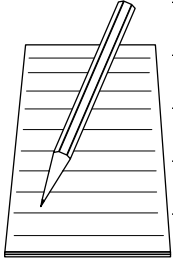
Control unit **CE**₀₁₀₂  II 3(2) G
SIRA 11 ATEX 5374X

Spray gun: **CE**₀₁₀₂  II 2 G EEx 0.24mJ
SIRA 11 ATEX 5374X

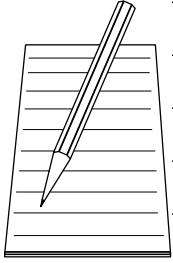
EU Declaration of Conformity

The EU Declaration of Conformity is enclosed with this product. If needed, further copies can be ordered through your WAGNER dealer by specifying the product name and serial number.

Order number: 2310487



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