

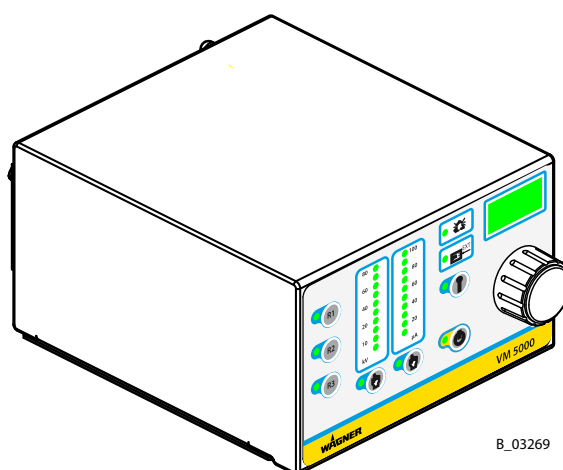


## Translation of the Original Operating Manual

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 5000 Control Unit for Electrostatic Manual Spray Guns



B\_03269

CE Ex II 3(2) G



## Table of Contents

<b>1</b>	<b>ABOUT THESE INSTRUCTIONS</b>	<b>5</b>
1.1	Preface	5
1.2	Warnings, Notices and Symbols in these Instructions	5
1.3	Languages	6
1.4	Abbreviations	6
1.5	Terminology for the Purpose of this Manual	6
<b>2</b>	<b>CORRECT USE</b>	<b>7</b>
2.1	Device Type	7
2.2	Type of Use	7
2.3	For Use in Potentially Explosive Areas	7
2.4	Misuse	7
<b>3</b>	<b>IDENTIFICATION</b>	<b>8</b>
3.1	Explosion Protection Identification	8
3.2	Identification X	8
3.3	Use in Areas Subject to Explosion Hazards	8
3.4	Type Plate	9
<b>4</b>	<b>BASIC SAFETY INSTRUCTIONS</b>	<b>10</b>
4.1	Safety Instructions for the Operator	10
4.1.1	Electrical Devices and Equipment	10
4.1.2	A Safe Work Environment	10
4.1.3	Personnel Qualifications	11
4.2	Safety Instructions for the Personnel	11
4.2.1	Personal Safety Equipment	11
4.2.2	Safe Handling of WAGNER Spray Devices	12
4.2.3	Grounding the Unit	12
4.2.4	Product Hoses	13
4.2.5	Cleaning and Flushing	14
4.2.6	Touching Hot Surfaces	14
4.2.7	Maintenance and Repair	15
4.2.8	Protective and Monitoring Equipment	15
<b>5</b>	<b>DESCRIPTION</b>	<b>16</b>
5.1	Components	16
5.2	Mode of Operation	16
5.3	Protective and Monitoring Equipment	16
5.4	Included Items	17
5.4.1	Standard Equipment	17
5.5	Data	17
5.6	Technical Data	17
5.7	Dimensions	17
5.8	Operating Elements and Connections	18
5.8.1	Operating Elements on Front Side	18
5.8.2	Connections on the Rear Side	19
<b>6</b>	<b>COMMISSIONING</b>	<b>20</b>
6.1	Training of Assembly/Commissioning Personnel	20
6.2	Storage Conditions	20
6.3	Installation Conditions	20

6.4	Additional Components	20
6.5	Location of the Control Unit	21
6.6	Grounding	21
6.7	Example AirCoat Spraying System	23
6.8	Ventilation of the Spray Booth	24
6.9	Verifying a Safe Operational Condition	24
<b>7</b>	<b>OPERATION</b>	<b>25</b>
7.1	Training the Operating Personnel	25
7.2	Tasks	25
7.2.1	Emergency Deactivation	25
7.3	Starting Up and Spraying	26
7.4	Setting and Saving Recipes	26
7.4.1	Setting the High Voltage	27
7.4.2	Setting the Current Limitation	28
7.4.3	Display During Spraying	29
7.5	Standby Mode	30
7.6	Perform Service Display	30
7.7	Device Configuration	31
7.7.1	Parameter Overview of Level 1 for Users	31
7.7.2	Access to the Device Configuration Mode	32
7.8	Setting Example for Parameter C11	34
7.9	Operating Hours Counter/Service Display	35
7.9.1	Maintenance Counter Set Up and Reading	36
7.10	External Interface	38
<b>8</b>	<b>CLEANING AND MAINTENANCE</b>	<b>40</b>
8.1	Cleaning	40
8.1.1	Cleaning Personnel	40
8.2	Maintenance	40
8.2.1	Maintenance Personnel	40
8.2.2	Maintenance Instructions	41
8.2.3	Safety Checks and Maintenance Intervals	41
<b>9</b>	<b>TROUBLESHOOTING AND RECTIFICATION</b>	<b>42</b>
<b>10</b>	<b>REPAIR WORK</b>	<b>44</b>
10.1	Repair Personnel	44
10.2	Repair Notes	44
<b>11</b>	<b>DISPOSAL</b>	<b>45</b>
<b>12</b>	<b>ACCESSORIES</b>	<b>46</b>
<b>13</b>	<b>SPARE PARTS</b>	<b>47</b>
13.1	How Can Spare Parts Be Ordered?	47
13.2	Spare Parts List for VM 5000 Control Unit	48
<b>14</b>	<b>EU DECLARATION OF CONFORMITY</b>	<b>50</b>

## 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:

 <b>DANGER</b>	Immediate risk of danger. Non-observance will result in death or serious injury.
 <b>WARNING</b>	Potential risk. Non-observance can result in death or serious injury.
 <b>CAUTION</b>	Potentially hazardous situation. Non-observance may result in minor injury.
 <b>NOTICE</b>	Potentially hazardous situation. Non-observance may result in damage to property.
<b>Notice</b>	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	2310484

#### Translation of the original operating manual

Language	Order no.				
English	2318718	Russian	2389789	Portuguese	2368904
French	2318719	Polish	2354771	Dutch	2359193
Italian	2318720	Swedish	2361009	Danish	2361008
Spanish	2318721	Finnish	2393122	Hungarian	2388630

Additional languages on request or at: [www.wagner-group.com](http://www.wagner-group.com)

### 1.4 ABBREVIATIONS

<b>Stk</b>	Number of pieces	<b>ET</b>	Spare part
<b>Pos</b>	Position	<b>SSt</b>	Stainless steel
<b>K</b>	Marking in the spare parts lists	<b>2K</b>	Two components
<b>Order no.</b>	Order number	<b>VM</b>	Voltage Module

### 1.5 TERMINOLOGY FOR THE PURPOSE OF THIS MANUAL

<b>Cleaning</b>	
Cleaning	Manual cleaning of devices and device parts with cleaning agent
Flushing	Internal flushing of paint-wetted parts with flushing agent
<b>Personnel qualifications</b>	
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, experience and knowledge of the 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 5000 control unit for controlling GM 5000EA, GM 5000EAC, GA 5000EA and GA 5000EAC electrostatic spray guns and the Universal high-voltage cascade.

### 2.2 TYPE OF USE

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

The VM 5000 control unit, may only be operated together with the above-mentioned spray guns or the Universal high-voltage cascade. 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 spray guns are suitable for spraying liquid products, in particular coating products based on the 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.)

If the WAGNER Universal high-voltage cascade is operated in connection with the VM 5000 control unit, the high-voltage cascade cannot be used in an Ex zone. However, the control unit may be still used in the zone 2 area.

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 VM5000 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 5000 control unit  
 Manufacturer: Wagner International AG  
 9450 Altstätten  
 Switzerland



CE<sub>0102</sub> 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 VM 5000 control unit as related equipment for the spray gun.

The manufacturer certifies that the VM 5000 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 5000 control unit:

- GM 5000EA spray gun
- GM 5000EAC spray gun
- GA 5000EA spray gun
- GA 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.

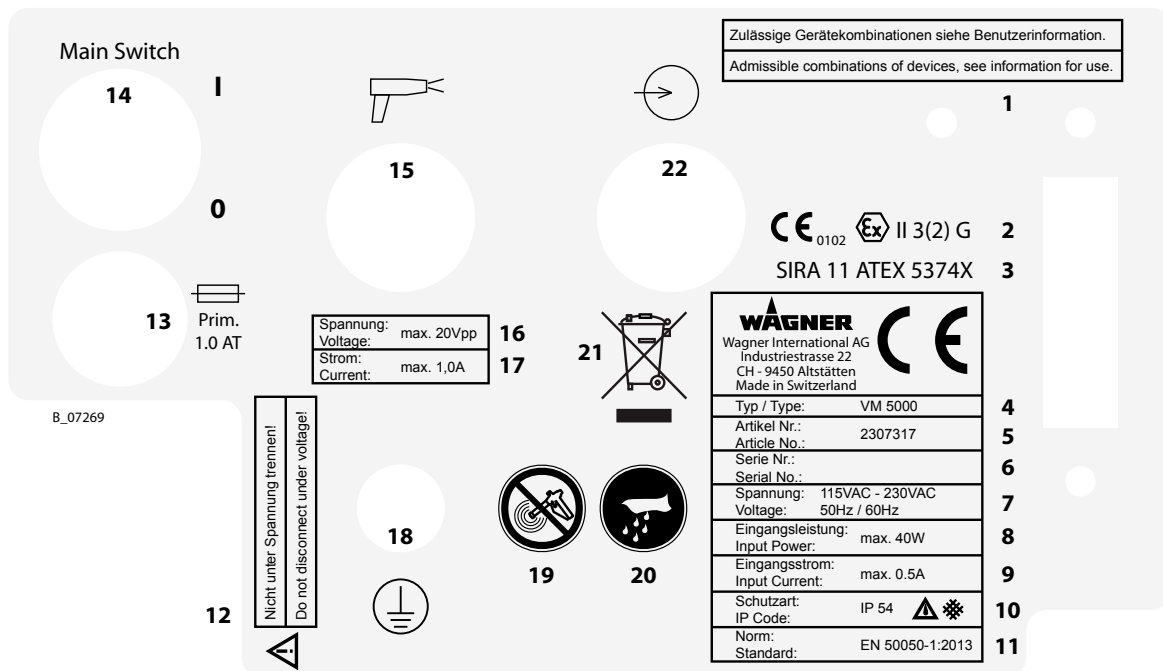




OPERATING MANUAL



**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.
22	Interface

## 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 electrically conductive 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.

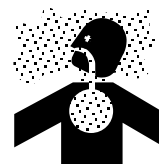


##### 4.2.1 PERSONAL SAFETY EQUIPMENT

##### **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!

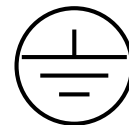
Explosion hazard and damage to the device.

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.

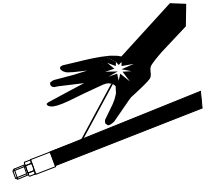


#### 4.2.4 PRODUCT HOSES

##### **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 units containing aluminium or galvanized and 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.



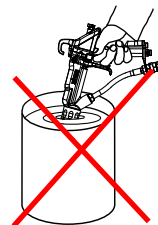
An explosive gas/air mixture forms in closed tanks.

- 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**

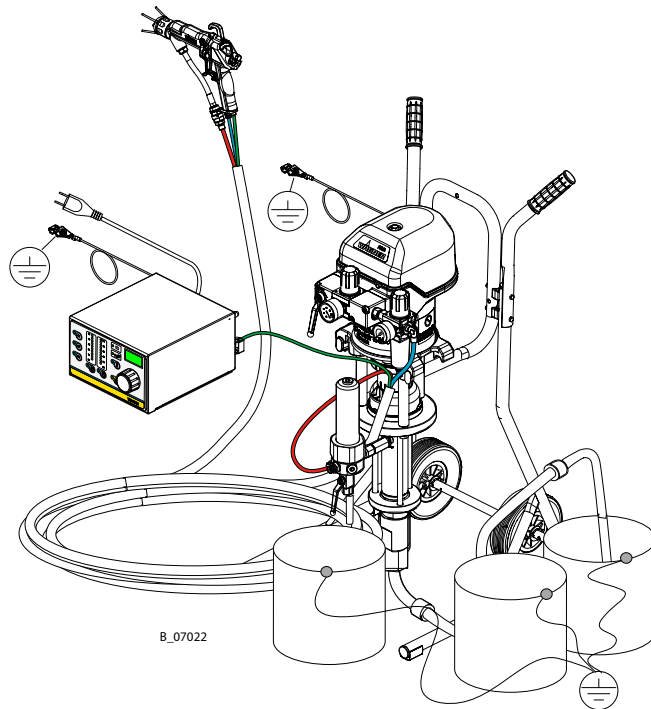
##### **Hazard due to removal of protective and monitoring equipment!**

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 5000 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 5000 control unit supplies the control voltage for the spray gun, in which high voltage is subsequently produced. The set value for high voltage and the spray current limitation are adjusted on the control unit and can be saved in three different recipes. 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.

Additionally, the VM 5000 control unit can be used as a universal high-voltage generator, in combination with the Universal high-voltage cascade.

In addition, the VM 5000 control unit has a wide range of other functions, such as an operating hours counter, service interval display, external approval, fault display and an easy-to-use interface.

### 5.3 PROTECTIVE AND MONITORING EQUIPMENT

The following functions are provided for safety:

- External release,
- 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	2310477	VM 5000 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	2310484	VM 5000 operating manual, German
1	see Chapter 1.3	Operating manual in local language

For special versions the delivery note applies.

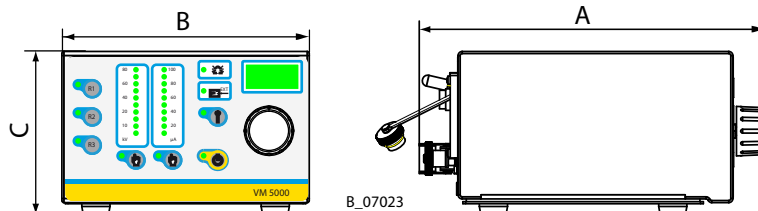
**5.5 DATA****5.6 TECHNICAL DATA**

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	IP54 *
Weight (without cables)	2.3 kg; 5.07 lb
Operating temperature range	0 °C - 40 °C; 32 °F - 104 °F

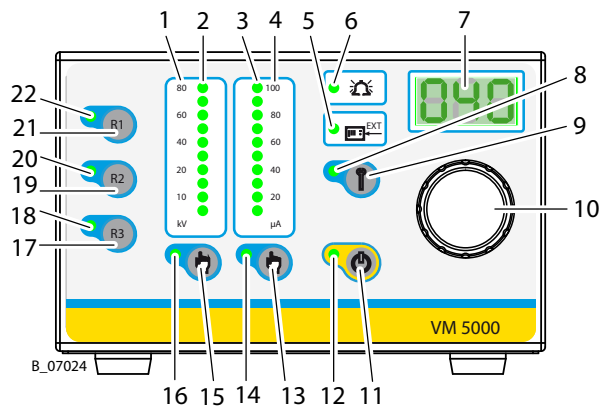
\* Splash water protection is only guaranteed when the spray gun cable socket is screwed to the device plug and the mains cable socket is fixed to the control unit plug with the safety clip.

**5.7 DIMENSIONS**

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



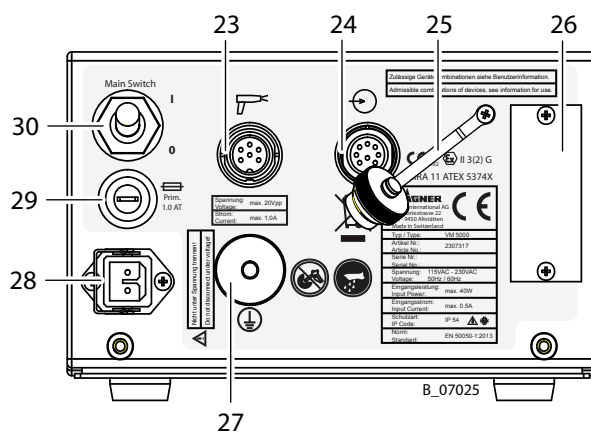
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**5.8 OPERATING ELEMENTS AND CONNECTIONS****5.8.1 OPERATING ELEMENTS ON FRONT SIDE**

Pos	Designation
1	Declaration of values for high voltage in kV
2	Illuminated display High voltage <ul style="list-style-type: none"> <li>– Lights up green</li> <li>– Display range: 0-80 kV</li> <li>– Single LED display: Nominal voltage</li> <li>– Bar display: Working voltage</li> </ul>
3	Illuminated display Spray current <ul style="list-style-type: none"> <li>– Lights up green</li> <li>– Display range: 0-100 µA</li> <li>– Single LED display: Spray current limitation</li> <li>– Bar display: Actual spray current</li> </ul>
4	Declaration of values for spray current in µA
5	Illuminated display External release <ul style="list-style-type: none"> <li>– Lights up, if parameter C11 is set</li> <li>– Blinks if the spray gun trigger is pulled, without external approval, while parameter C11 is set</li> </ul>
6	Illuminated display Fault
7	LED display, 7 segments, three-digit number <ul style="list-style-type: none"> <li>– Displays set values and actual values for high voltage and for the spray current</li> <li>– Display showing error number in the event of warnings and malfunctions</li> </ul>
8	Illuminated display Service
9	Push button Service
10	Universal control dial <ul style="list-style-type: none"> <li>– Dynamic digital control dial with 32 positions per revolution</li> <li>– Adjustment speed is proportional to rotational speed</li> <li>– Used to adjust high voltage and spray current</li> <li>– For setting parameter values in configuration mode</li> </ul>
11	Push button Standby mode
12	Illuminated display Standby
13	Push button Spray current <ul style="list-style-type: none"> <li>– To activate the function, the current limitation is set with the control dial (16) and is indicated in the LED display 9</li> <li>– Adjusting range: 5-100 µA</li> <li>– Resolution: 1 µA</li> </ul>
14	Illuminated display Spray current

Pos	Designation
15	Push button High voltage <ul style="list-style-type: none"> <li>- To activate the function, the high voltage is set with the control dial (16) and is indicated in the LED display 8</li> <li>- Adjusting range: 5-80 kV</li> <li>- Resolution: 1 kV</li> </ul>
16	Illuminated display High voltage
17	Push button Recipe 3
18	Illuminated display R3: Illuminates if recipe 3 is used
19	Push button Recipe 2
20	Illuminated display R2: Illuminates if recipe 2 is used
21	Push button Recipe 1
22	Illuminated display R1: Illuminates if recipe 1 is used

### 5.8.2 CONNECTIONS ON THE REAR SIDE



Pos	Designation
23	Spray gun connection <ul style="list-style-type: none"> <li>- To connect a GM 5000EA, GM 5000EAC, GA 5000EA or GA 5000EAC spray gun.</li> <li>- When operating with Universal high-voltage cascade → Universal high-voltage cascade connection</li> <li>- Warning - Do not disconnect under voltage.</li> </ul>
24	Interface <ul style="list-style-type: none"> <li>- Warning - Do not disconnect under voltage.</li> </ul>
25	Cover of the interface connection
26	Cover of the service connection <ul style="list-style-type: none"> <li>- Only for WAGNER service personnel</li> </ul>
27	Knurled nut grounding <ul style="list-style-type: none"> <li>- Grounding cable connection to the signal ground</li> </ul>
28	Mains input terminal <ul style="list-style-type: none"> <li>- Connection for mains cable with safety clip</li> <li>- Warning - Do not disconnect under voltage.</li> </ul>
29	Primary fuse: 1.0 ampere, slow-acting
30	Mains supply switch <ul style="list-style-type: none"> <li>- 0 = The control unit is deactivated</li> <li>- I = The control unit is activated</li> </ul>

## 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

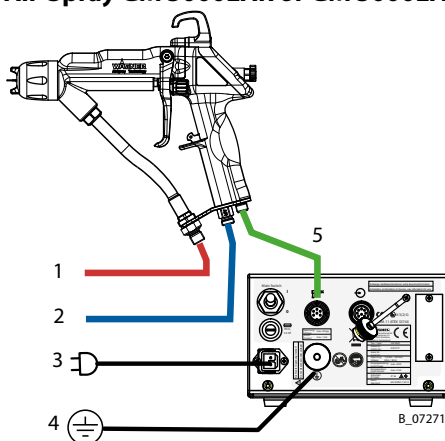
The air temperature at the installation site must be in a range between 0 °C and 40 °C (32 °F and 132 °F). The relative air humidity at the installation site must be between 10 and 95% (without condensation).

### 6.4 ADDITIONAL COMPONENTS

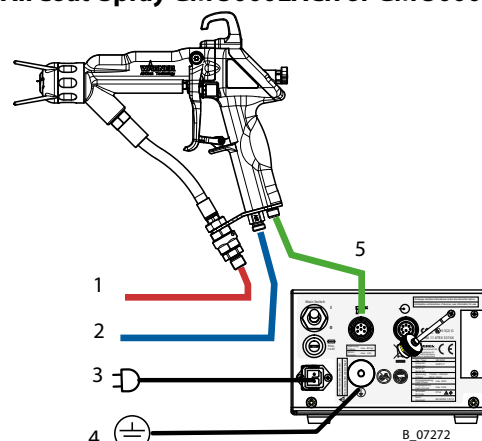
The VM 5000 control unit can be used to complete an electrostatic manual spray system. To do so, a suitable spray gun and the relevant components for the selected spray process are required (see WAGNER accessories).

Spray guns that are compatible with the VM 5000:

#### 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

The operation of the VM 5000 in combination with the Universal high-voltage cascade is described in detail in the Universal high-voltage cascade's operating manual.

## 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.

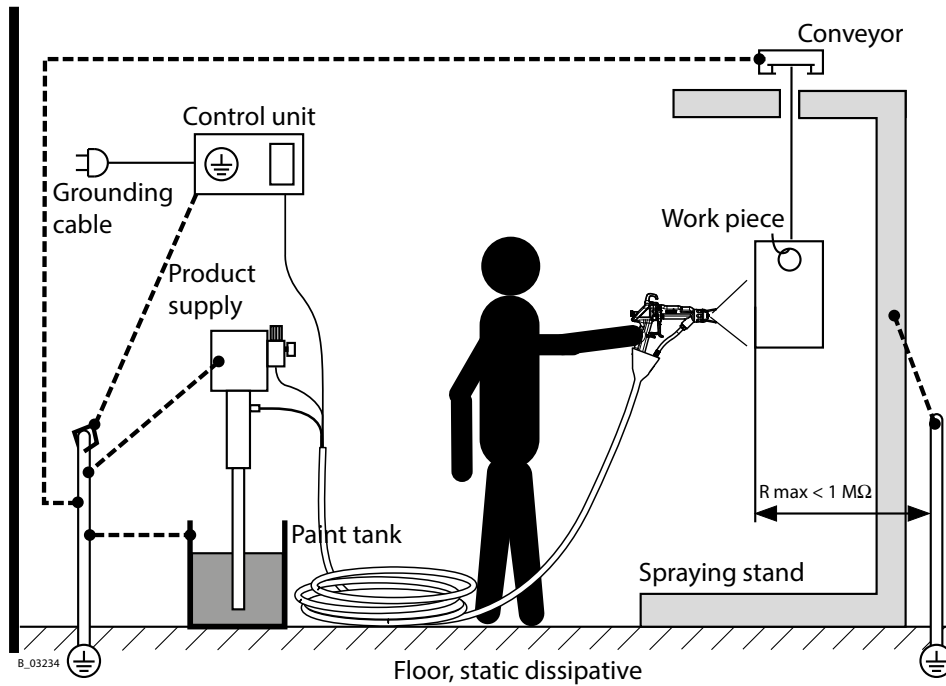
#### **A poorly grounded work piece causes:**

- 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 MΩ (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 <sup>2</sup> / AWG 12
Product supply	
Paint tank	
Conveyor	16 mm <sup>2</sup> / AWG 6
Booth	
Spraying stand	

### Grounding of spray gun

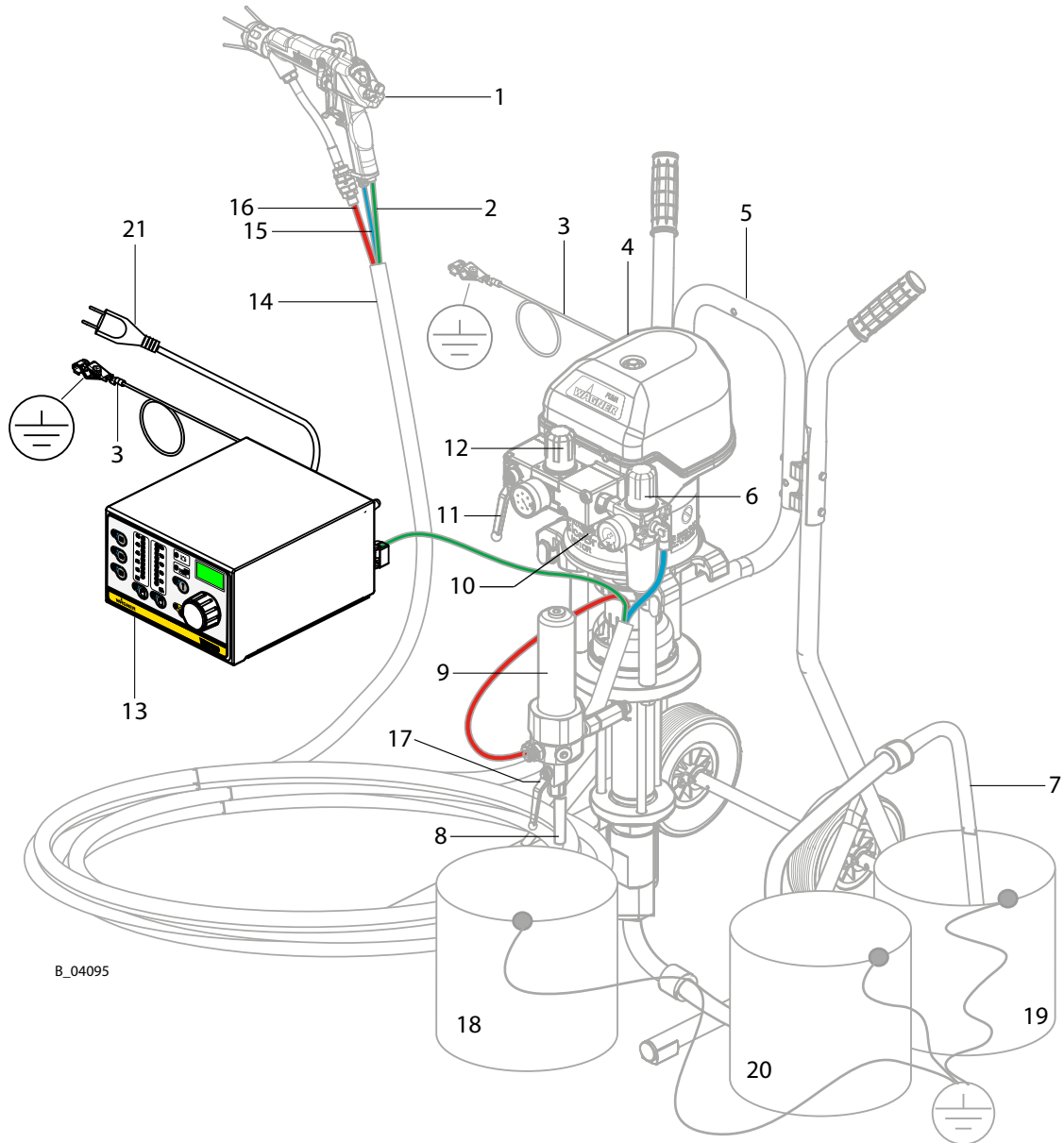
The spray gun is grounded via the spray gun cable.

- The GM 5000EA, GM 5000EAC, GA 5000EA and/or GA 5000EAC spray gun must be connected to the VM 5000 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\_04095

Pos.	Designation
1	GM 5000EACF spray gun
2	Spray gun cable
3	Grounding cable
4	Pneumatic pump
5	Trolley
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 5000 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 5000 electrostatic control unit via the mains cable to the socket interlocked with the extraction system. Or lock the external release with the exhaust air unit.
- Lock the external release with an appropriate tool (e.g., key switch) (the high-voltage supply must be secured to prevent unauthorized persons from switching it on).
- 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 on the rear of the control unit must be protected with a 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.

**Configuring the control unit**

- see Chapter 7.7

**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](#).

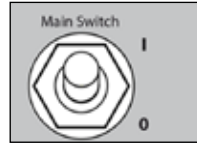
#### 7.2.1 EMERGENCY DEACTIVATION

In the case of unforeseen occurrences, proceed as follows:

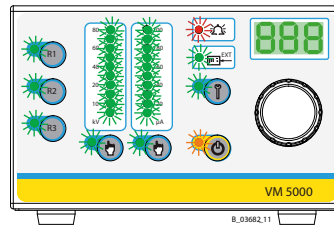
1. Switch off control unit.
2. Close the compressed air supply.
3. Relieve pressure according to the operating manual of the product pressure generator.
4. Point the spray gun toward the grounded collecting tray.
5. Pull the trigger of the spray gun until no further pressure is present.

**7.3 STARTING UP AND SPRAYING**

1. Set main switch to position I.



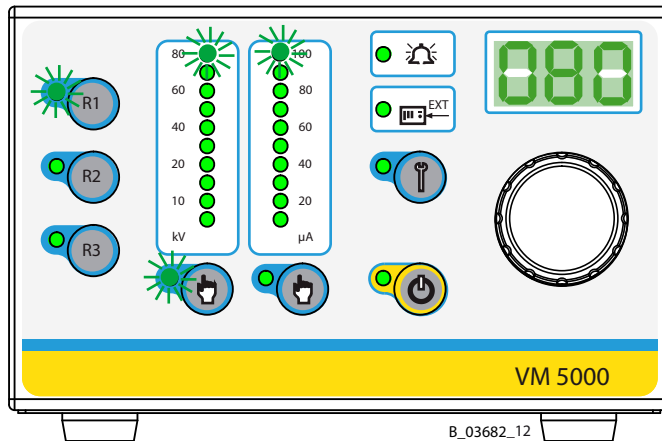
2. For approx. 1 second, all LEDs light up.  
→ Display test



3. In the display, the hardware status and software version are shown briefly, one after the other.



4. The control unit is ready for operation.  
**Notice:**  
Each starting sequence is concluded by allocating the saved set data in recipe R1.



**7.4 SETTING AND SAVING RECIPES**

Set values for the high voltage, in kV, and for the spray current limitation, in µA, are stored in a recipe. By default, the following values are saved at the factory in the 3 storage places available for recipes:

Recipe No.	Set value - high voltage in kV	Set value - spray current limitation in µA
R1	80	100
R2	60	100
R3	40	80

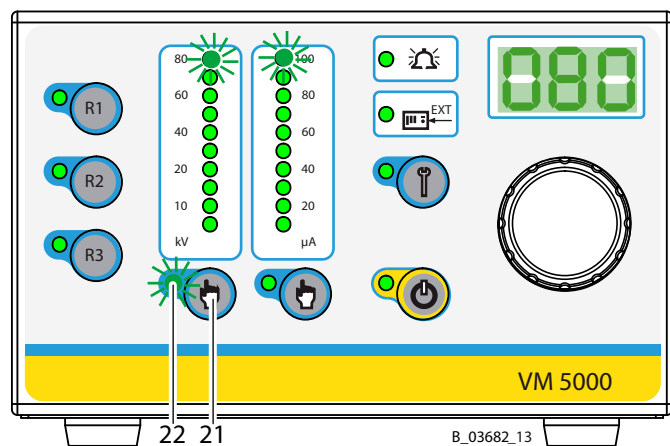
Recipes 1-3 can be selected and saved directly with the program buttons R1, R2 and R3. Once the recipe required has been called up, the individual coating parameters can be called up and modified with the corresponding selection buttons (see Chapter 7.4.1 and 7.4.2). When a parameter is changed, the LED on the left of the program button goes out and indicates to the user that a parameter value has been changed.

The process for saving parameters is described below.

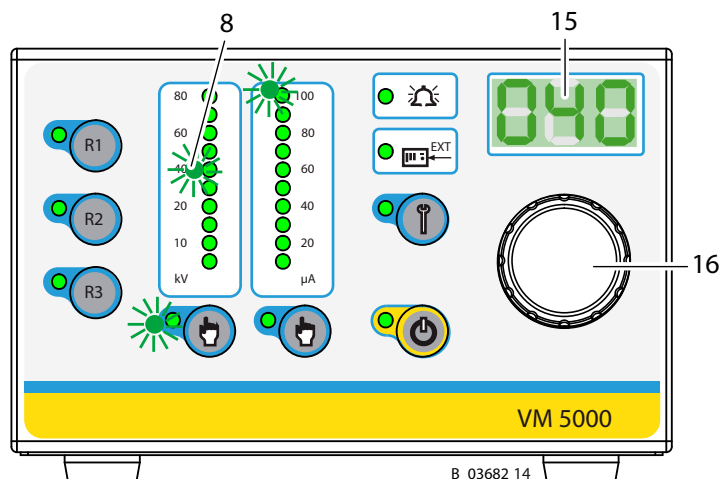
- To reuse the originally set values, press the corresponding program button briefly. The modified values are not applied.
- However if the modified values should be saved, press and hold the corresponding program button for approx. 2 seconds, until the LED beside the button starts to flash quickly. The modified values are then saved.

#### 7.4.1 SETTING THE HIGH VOLTAGE

1. Press the High-voltage push button (21) to adjust the high voltage. The LED (22) indicates that high voltage is selected.



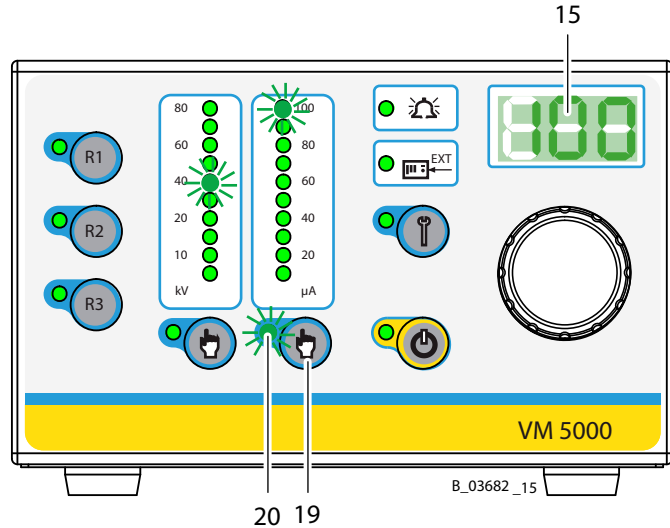
2. The high voltage can now be adjusted with the universal control dial (16) between 5 to 80 kV with a resolution of 1 kV. The corresponding value is indicated in the LED display (15).



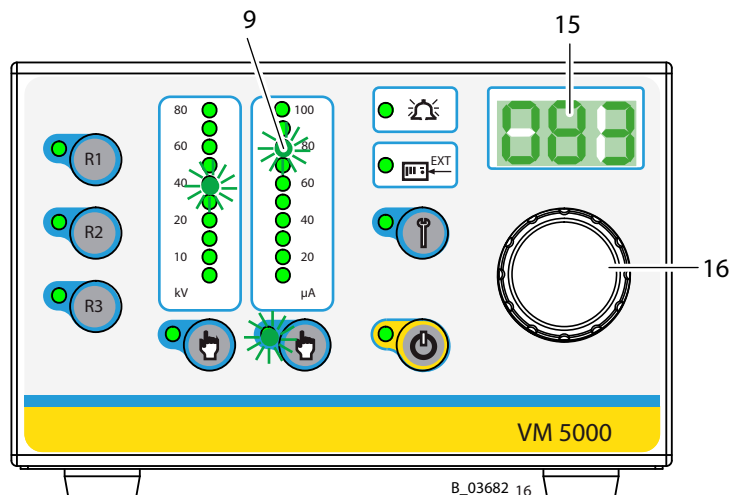
Above the High-voltage push button (21) is the High-voltage bar graph display (8). If the control unit is in the ready position, this light strip shows the set value as a dot.

### 7.4.2 SETTING THE CURRENT LIMITATION

1. Press the Current limitation push button (19) to adjust the limitation of the spray current. The LED (20) indicates that current limitation is selected.



2. The current limitation can now be adjusted with the universal control dial (16) between 10 - 100  $\mu\text{A}$  with a resolution of 1  $\mu\text{A}$ . The corresponding value is indicated in the illuminated display (15).



Above the current limitation push button (19) is the current limitation bar graph display (9). If the control unit is in the ready position, this light strip shows the set value as a dot. The current limitation is an adjustable threshold. If this threshold is exceeded, for example, by the spray gun having approached the object being sprayed, the high voltage is adjusted downwards until the threshold is no longer exceeded.

The set values for high voltage (40 kV) and for current limitation (83 mA) that are shown in the examples, are saved in R2 by pressing and holding the Recipe push button for a longer period of time (for > 2 seconds).

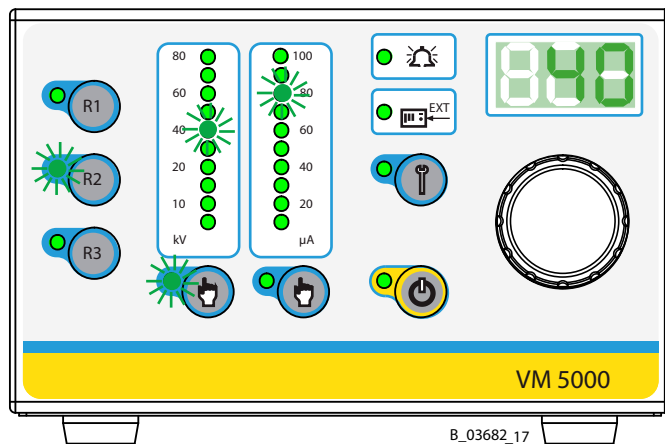
**7.4.3 DISPLAY DURING SPRAYING**

Ready to spray using R2 recipe.

See figure on right.

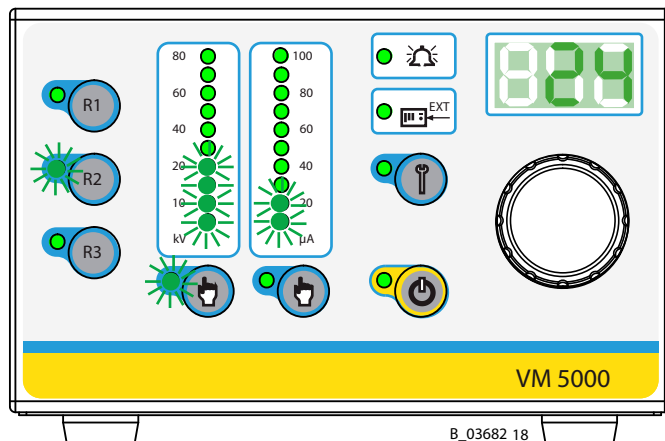
Control unit in ready position.

The LEDs for the set values light up in a dot arrangement and the value for high voltage, is displayed digitally. If you press the push button for current limitation, the adjusted set value for the spray current limitation is displayed digitally.



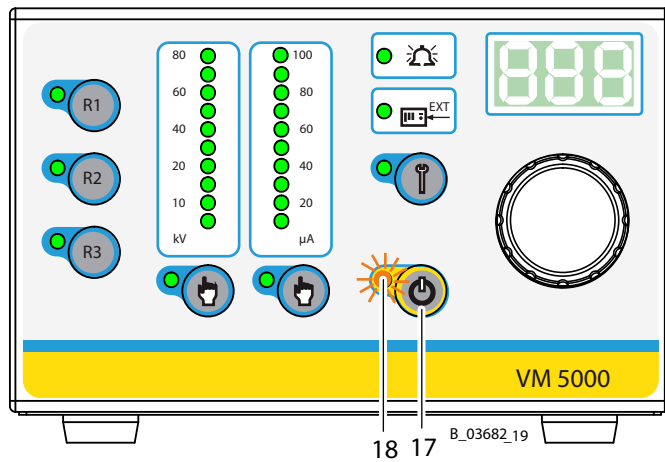
**Spraying using recipe R2.**

By actuating the trigger on the spray gun, high voltage is produced. The LEDs light up as a bar display and show the actual values. The current actual value for the activated push button for high voltage (kV) is displayed digitally. If the push button for the spray current limitation is pressed, the respective LED lights up and the respective actual value appears in  $\mu\text{A}$ .



**7.5 STANDBY MODE**

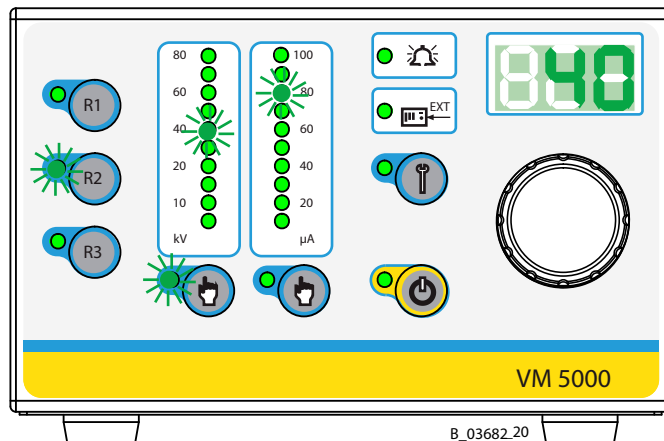
If you want to spray without high voltage, select the standby mode.  
 Press push button (17) briefly and the Standby illuminated display (18) lights up.  
 All the other LEDs go out.



The previously saved standby mode can be accessed from standby mode by pressing the push button (17) again.

**Notice:**

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

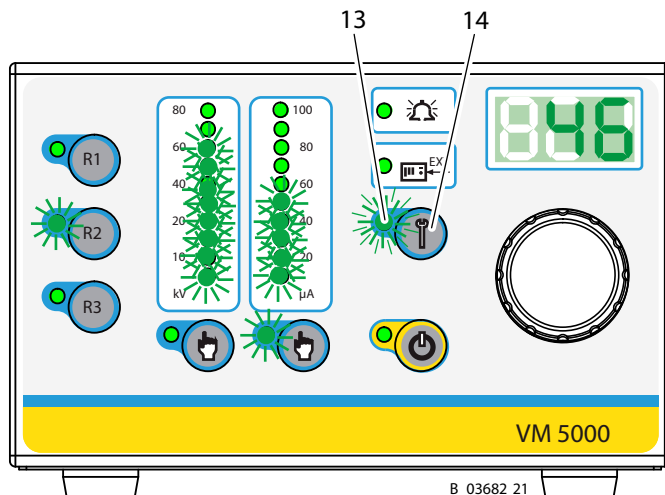


**7.6 PERFORM SERVICE DISPLAY**

Prerequisite: The function Maintenance interval limit is activated.

**Servicing the spray gun**

Once the time for the defined maintenance interval has expired, the illuminated display (13) starts to flash.  
 The flashing service display merely acts as a warning. You can continue working without any limitations.



**7.7 DEVICE CONFIGURATION**

Level 1: for operator	Level 2: for WAGNER service department	Level 3: for WAGNER production plant
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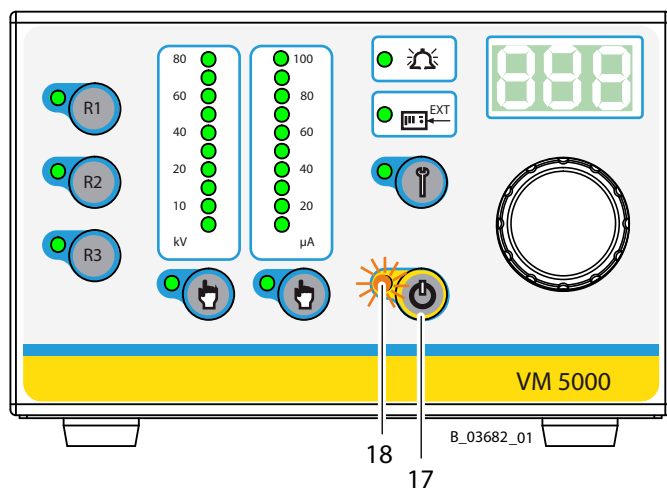
**7.7.1 PARAMETER OVERVIEW OF LEVEL 1 FOR USERS**

Parameter		Value	Description
C11	External release (remote)	off (factory setting)	The device functions as a standalone device. External release by interface does not have to be defined. The bypass is activated.
		on	If parameter C11 is set, the LED external release on the control unit lights up continuously. The external release by interface must be issued. If the trigger is pulled despite the fact that no release has been issued, the illuminated display external release starts to flash quickly. Release is present when input is connected to GND.
C12	External set value specification	off (factory setting)	The set values for high voltage in kV and current limitation in $\mu$ A are set at the operating panel.
		on	The set values for high voltage, in kV, and current limitation, in $\mu$ A, are predefined using the interface's two analog power inputs. Application example: Set value specification by superordinate control (PLC) Set values can no longer be adjusted at the front control panel. All recipe functions (save, call up recipe, etc.) are locked.
C13	Lock	off (factory setting)	Lock is deactivated.
		on	Lock is activated, set values (kV and $\mu$ A) cannot be changed, user can only select recipes and control functions.
		pro	Lock pro (program) Recipes and control functions can be selected. The set values (kV and $\mu$ A) can be adjusted but cannot be saved in the recipes.
C14	Operating mode This parameter is linked to parameter C11. If parameter C14 is set, parameter C11 is automatically switched to "oFF".	off (factory setting)	Operation with spray gun GM 5000EA or GM 5000EAC.
		2	Electrostatic automatic spray gun GA 5000EA or GA 5000EAC
		3	Universal high-voltage cascade 3 G
		4	Universal high-voltage cascade 7.5 G
C15	Locking spray gun operating button	off (factory setting)	Lock is switched off.
		1	Partial locking of spray gun operating button: – Standby function disabled. – Recipe change is possible.
		2	Partial locking of spray gun operating button: – Recipe change disabled. – Standby is possible.
		3	Full locking of spray gun operating button: – Recipe change disabled. – Standby function disabled.

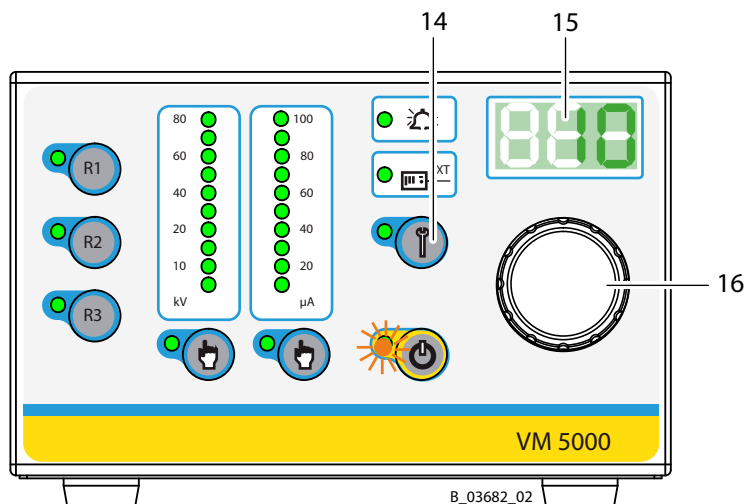
C19	Reset recipes	no (factory setting)	No reaction
		"res"	All programs are set to delivery condition, if res is saved with the service button.
C20	Reset configuration	no (factory setting)	No reaction
		"res"	All configuration parameters are set to delivery condition (factory setting), if res is saved with the service button.

**7.7.2 ACCESS TO THE DEVICE CONFIGURATION MODE**

1. Switch to standby by pressing the Standby button (17).  
The orange LED Standby (18) lights up.

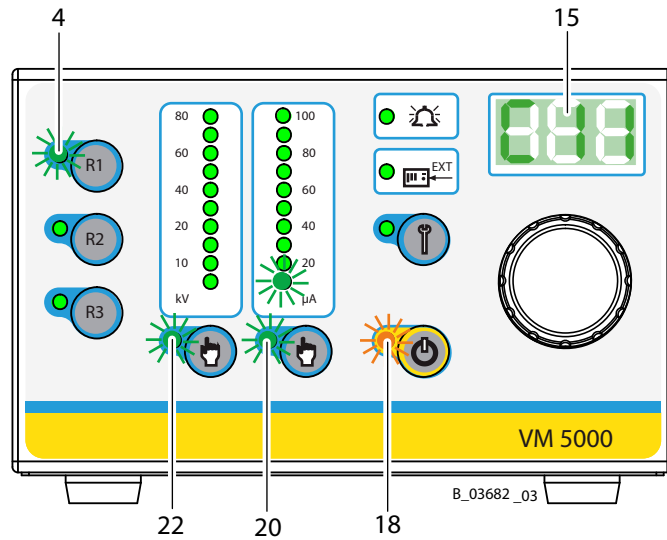


2. Press and hold the Service push button (14).
3. Turn the universal control dial (16) with the other hand until the display (15) shows the number 10.  
Then release the service button (14).  
The scrolling text "configuration" is displayed.  
The device is now in configuration mode.





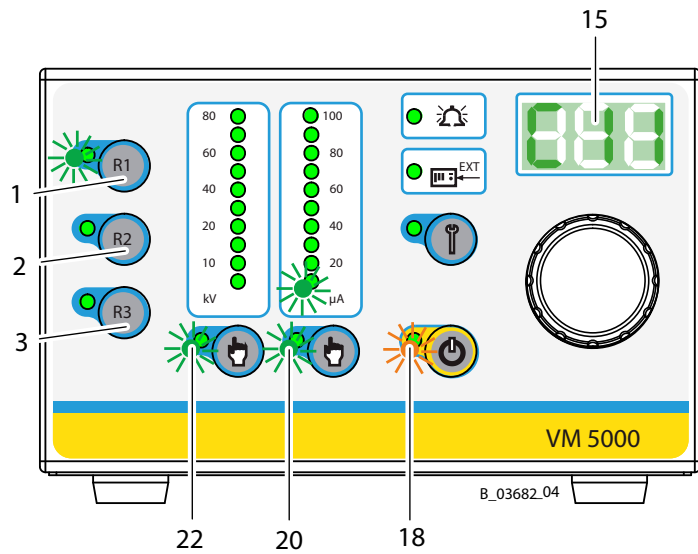
- The LED display (15) now shows the first configuration setting C11. At the same time, the two LED displays High voltage (22) and Spray current limitation (20) start to flash. The illuminated display Standby (18) flashes quickly.



Level 1 (1) illuminated display:  
Parameters C11 to C20  
(for the end user)

Level 2 (2):  
Parameters C21 to C30  
(for WAGNER Service Department)

Level 3 (3):  
Parameters C31 to C40  
(for production plant; service center)

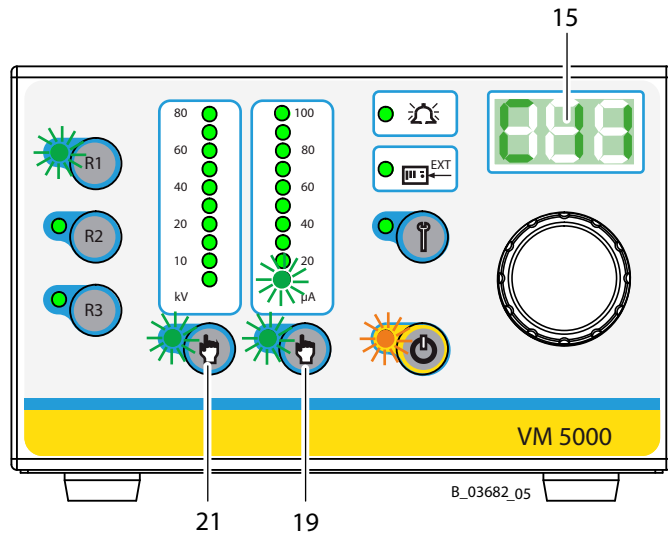


For ease of operation the configuration settings are divided into three levels. The first level is for the end user, the other two levels are password protected and reserved for the WAGNER service department and the WAGNER production sites or the WAGNER service center, which have the necessary infrastructure.

**7.8 SETTING EXAMPLE FOR PARAMETER C11**

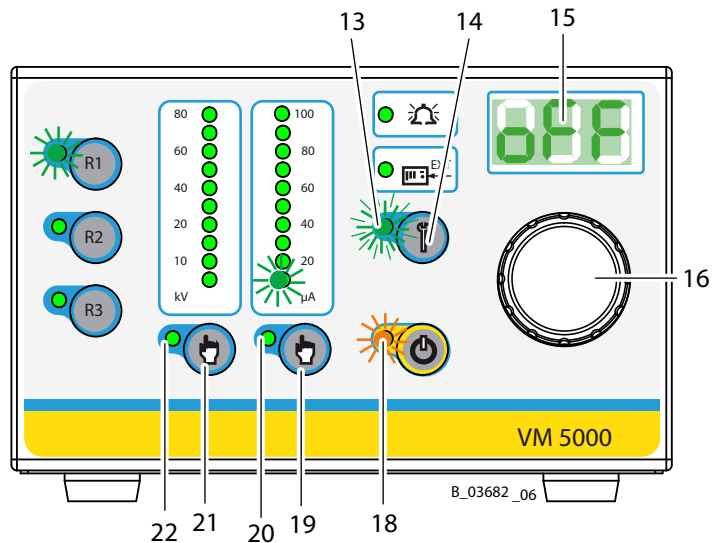
After getting started in configuration mode, the display (15) shows parameter **C11** by default.

Press one of the push-buttons (21) or (19) to select all possible parameters for the end user. To change a selected parameter value (e.g., C11), press push button Service (14). The content of C11 is displayed (15).

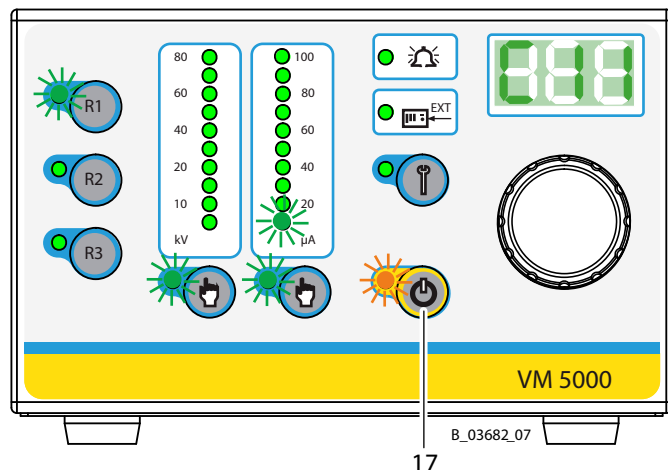


The flashing illuminated display (13) indicates that the parameter value "oFF" in the display (15) can be changed with the universal control dial (16). Possible values in C11 are "on" or "oFF".

Press and hold the push button (14) to save the set value to C11. Once the value has been saved, the illuminated display (13) starts flashing quickly.



Going from the configuration mode back to the operating mode:  
Press the Standby button (17).



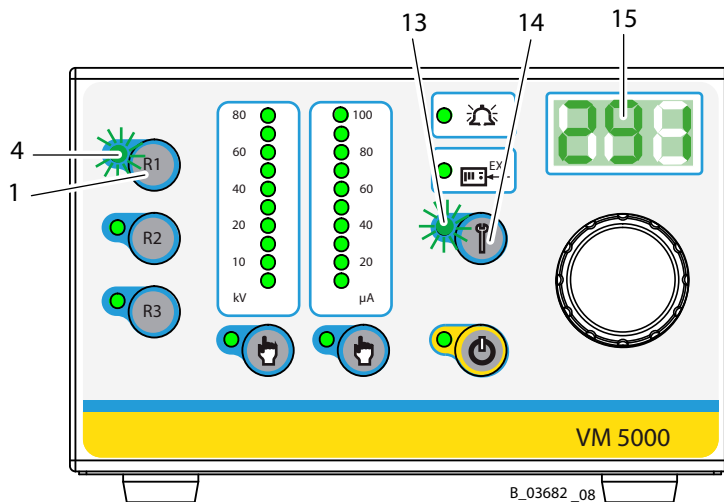
**7.9 OPERATING HOURS COUNTER/SERVICE DISPLAY**

Two hour counters are integrated into the control unit. The absolute counter measures the ongoing hours of operation of the spray gun and maintenance intervals for the spray gun can therefore be determined and monitored with the maintenance hours counter.

When the control unit is in the ready position, the maintenance menu screen can be accessed using the push button (14).

**Maintenance menu structure (illuminated display (13) is activated)**

Push button	Description of display
R1	Display of the spray gun's absolute accrued operating hours. Display format: Counter reading < 999 hours: 001 = 1 h; 291 = 291 h Counter reading > 1000 hours: 1.23 = 1230 h; 45.2 = 45200 h Maximum display value = 99.9 = 99900 h Afterwards it shows flashing dashes.
R2	Display of temporary maintenance counter and how to reset this counter
R3	Set maintenance interval in hours, or activate or lock this function

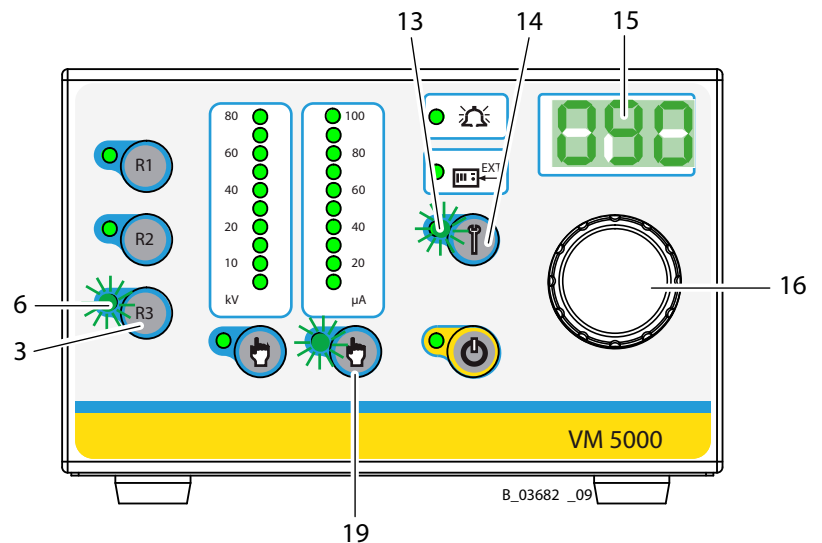


### 7.9.1 MAINTENANCE COUNTER SET UP AND READING

When using the device for the first time, the function for the maintenance hours counter is deactivated. This function can be activated with the R3 push button (3). The maintenance interval limit can be set within a range of 0 to 999 hours.

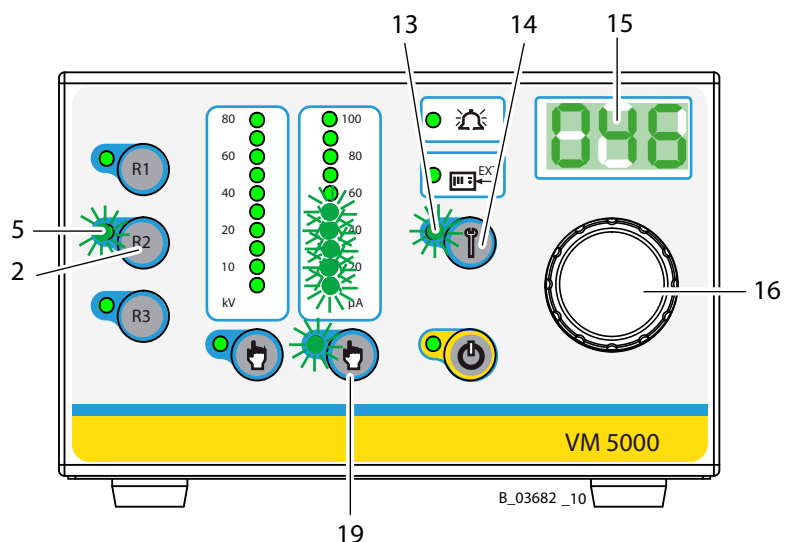
#### Setting and saving the service interval limit in hours

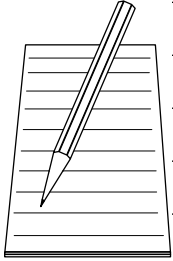
1. Press the push button (3) briefly.  
Illuminated display (6) lights up.
2. Use the control dial (16) to set the maintenance interval limit you want (e.g., 90 hours).
3. Check setting on the display (15).
4. To save the value, press the push button (19) and hold until the display (15) starts flashing quickly.



#### Review counter reading since last service carried out on the spray gun

1. Press the push button (2) briefly.  
Illuminated display (5) lights up.
2. Read display (15). In the example, 46 hours have passed since the last spray gun service.  
The bar display on the left indicates that 50% of the set interval time has passed.
3. By pressing and holding the push button (19), the display (15) can be reset to 0.



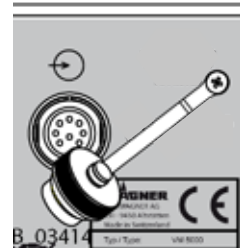


A series of horizontal lines for writing, starting from the top of the page and extending down to the bottom. The lines are evenly spaced and cover most of the page width.

**7.10 EXTERNAL INTERFACE**

The control unit is equipped with an interface.

Before using it, the respective parameters have to be selected in the device configuration.



**External release**

GND >> Release  
white

**Fault reset**

neg. edge >> Reset  
brown

**Fault output**

24VDC >> Fault  
green

**High-voltage input**

8V >> 80kV  
yellow

**µA input**

10 V >> 100 µA  
gray

**High-voltage output**

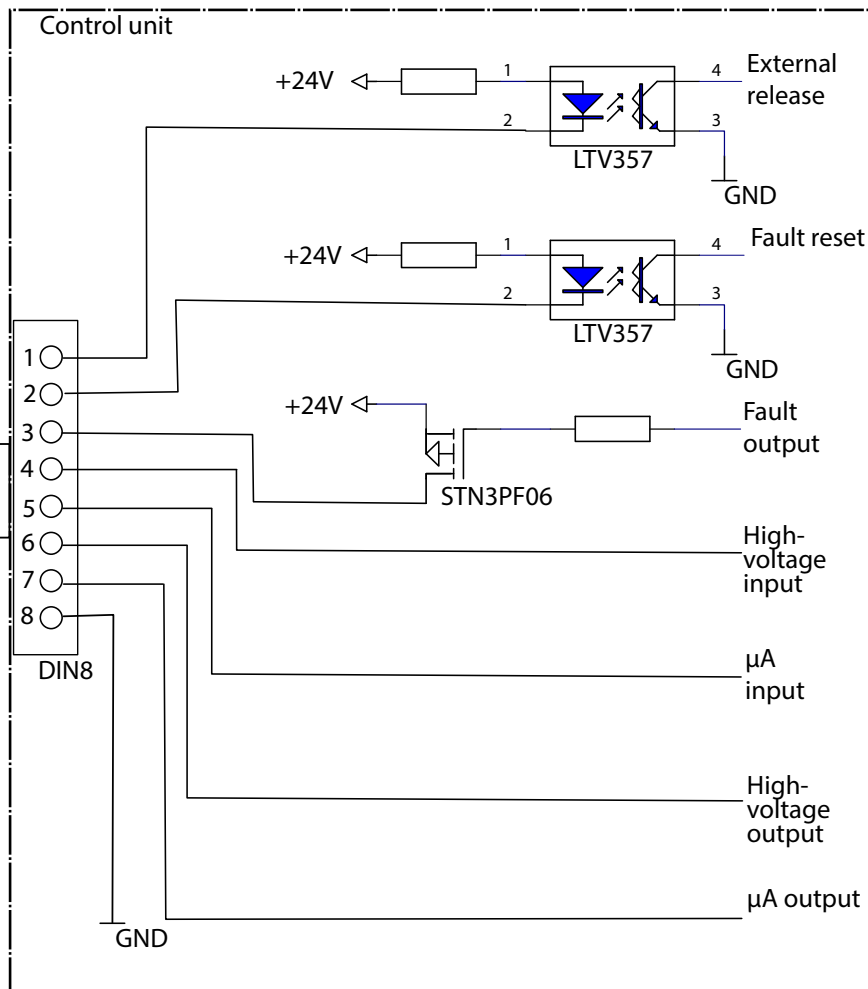
8V >> 80kV  
pink

**µA output**

10 V >> 100 µA  
blue

**Ground**

red



B\_03415

Pin No.	Designation	Description
1 in	External release	Potential-free contact between pin 1 and pin 8 (ground) - Closed → Release issued - Open → Release not issued
2 in	Fault reset	Potential-free contact (button) between pin 2 and pin 8 (ground) - If there is a fault, it can be acknowledged by pressing a button. - Acknowledgement is only given via the negative edge.
3 out	Fault output	If there is a fault, +24VDC is issued at pin 3 in reference to pin 8 (ground). - Maximum current 0.5 A
4 in	DC kV in	Set value specification for high voltage Analog DC current input between pin 4 in reference to pin 8 (ground) - 0.1V corresponds to 1kV - 8.0V is the maximum specification and corresponds to 80kV
5 in	DC μA in	Set value specification for spray current limitation Analog DC current input between pin 5 in reference to pin 8 (ground) - 0.1V corresponds to 1μA - 10.0V is the maximum specification and corresponds to 100μA
6 out	DC kV out	Output of current working voltage Analog DC current output between pin 6 in reference to pin 8 (ground) - 0.1V corresponds to 1kV - 8.0V is the maximum output and corresponds to 80kV
7 out	DC μA out	Output of current working spray current Analog DC current output between pin 7 in reference to pin 8 (ground) - 0.1V corresponds to 1μA - 10.0V is the maximum output and corresponds to 100μA

## 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 device.
- 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. → Chapter [4.2.5](#)

#### 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 Chapter 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.

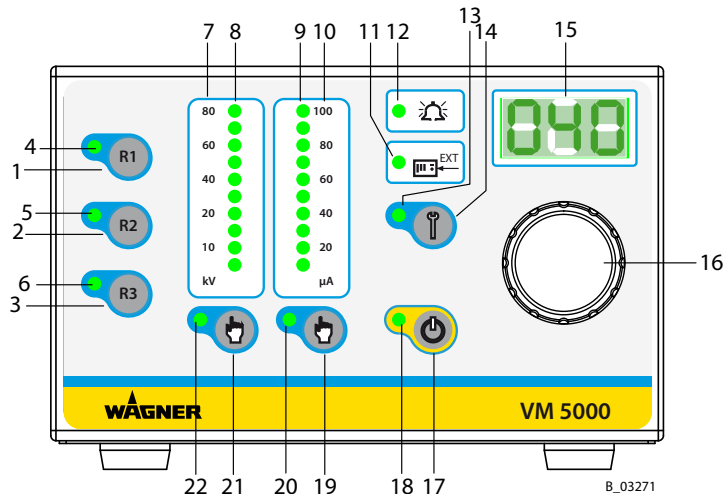
## 8.2.3 SAFETY CHECKS AND MAINTENANCE INTERVALS

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, spray gun flushing	daily	Spray gun operating manual
Hoses, tubes, couplings	daily	
Grounding measures	weekly	Chapter <a href="#">4.2.3</a> , Chapter <a href="#">6.6</a>
Inspection for damage	weekly	Chapter <a href="#">8</a> , Chapter <a href="#">9</a>
Locking of the technical ventilation with the electrostatic spraying equipment	annually	Chapter 6.8

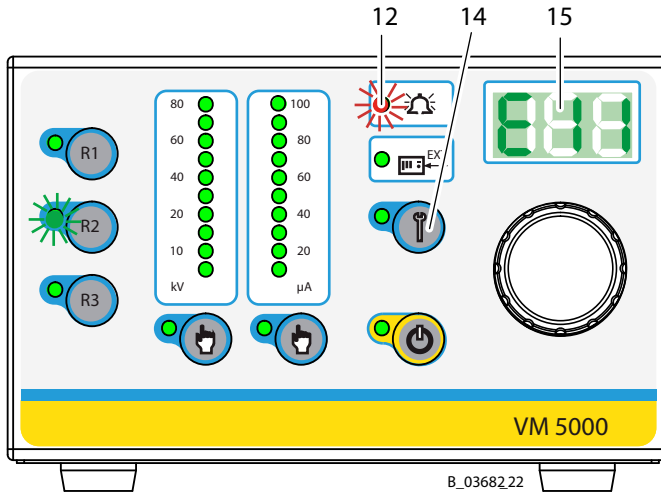
The above recommended intervals are maximum values and may be modified by the operator depending on the local and operational conditions and the contamination. Damaged devices must be decommissioned and repaired immediately. The functionality and completeness of the control unit must be checked regularly. 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
No illuminated display lights up	<ul style="list-style-type: none"> <li>- Mains supply not switched on</li> <li>- Fuses defective</li> </ul>	<ul style="list-style-type: none"> <li>- Check and switch on mains supply</li> <li>- Replace fuses</li> <li>- WAGNER Service Department</li> </ul>
No high voltage	<ul style="list-style-type: none"> <li>- Spray gun cable not connected or defective</li> <li>- Spray gun not connected or defective</li> <li>- Excessive conductivity of the lacquer</li> </ul>	<ul style="list-style-type: none"> <li>- Connect spray gun cable</li> <li>- WAGNER Service Department</li> <li>- See operating manual of spray gun</li> </ul>
Malfunction LED (12) lights up. Fault message in display (15)	<ul style="list-style-type: none"> <li>- See following table</li> </ul>	<ul style="list-style-type: none"> <li>- See following table</li> </ul>

The fault LED (12) indicates faults. In addition, the error number is shown in the 7-segment display (15). If a fault occurs, the high voltage is immediately switched off. The user can only continue to work once the fault has been remedied and acknowledged with the push button for service (14).



Code	Malfunction	Cause	Remedy
E11	Ground monitoring	<ul style="list-style-type: none"> <li>- Grounding cable is interrupted</li> <li>-</li> <li>- The spray gun is not connected</li> </ul>	<ul style="list-style-type: none"> <li>- Check/replace spray gun cable</li> <li>- Check/replace spray gun</li> <li>- Connect spray gun</li> </ul>
E12	No coil current/ cascade interruption	<ul style="list-style-type: none"> <li>- The spray gun is not connected</li> <li>- Spray gun cable is interrupted</li> <li>- Cascade in spray gun is interrupted → defective</li> </ul>	<ul style="list-style-type: none"> <li>- Connect spray gun</li> <li>- Check/replace spray gun cable</li> <li>- Check/replace spray gun</li> </ul>
E13	Coil current too big	<ul style="list-style-type: none"> <li>- Cascade of the connected spray gun is defective</li> </ul>	<ul style="list-style-type: none"> <li>- Check/replace spray gun</li> </ul>
E21-E29	Exception error	<ul style="list-style-type: none"> <li>- Hardware defect has occurred</li> </ul>	<ul style="list-style-type: none"> <li>- If problem persists, contact WAGNER service department</li> </ul>
E30	Cabinet door monitoring	<ul style="list-style-type: none"> <li>- In Aquacoat operation: switching on the high voltage with an open door</li> </ul>	<ul style="list-style-type: none"> <li>- Close Aquacoat cabinet door</li> </ul>
E40-E43	Spray guns - communication faulty	<ul style="list-style-type: none"> <li>- Spray gun cable defective</li> </ul>	<ul style="list-style-type: none"> <li>- Check/replace spray gun cable</li> </ul>
		<ul style="list-style-type: none"> <li>- Operating unit of spray gun defective</li> </ul>	<ul style="list-style-type: none"> <li>- WAGNER Service Department</li> </ul>
		<ul style="list-style-type: none"> <li>- Control unit defective</li> </ul>	<ul style="list-style-type: none"> <li>- WAGNER Service Department</li> </ul>
E60	Password error	<ul style="list-style-type: none"> <li>- Password not set</li> </ul>	<ul style="list-style-type: none"> <li>- Password to be set by service center</li> </ul>

## 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 device.
- 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 the system in accordance with Chapter [4.2.5](#).

##### **After Repair Work**

- Carry out safety checks in accordance with Chapter [6.9](#).
- Put the system into operation and check for leaks as described in Chapter [6.9](#).
- Function test in accordance with Chapter [6.9](#).
- In accordance with DGUV 100-500 Chapter 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 equipment 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.

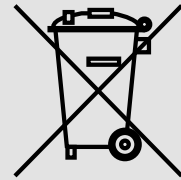
### **NOTICE**

#### **Do not dispose of used electrical equipment with household refuse!**



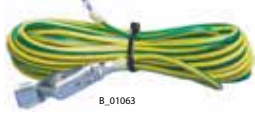

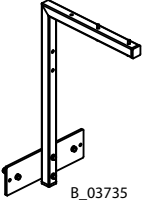
Risk of injury and damage to the device.

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
2317600	VM 5000 interface cable, 10 m; 32.8 ft	 B_03471
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.

## 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:

- billing address
- 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**

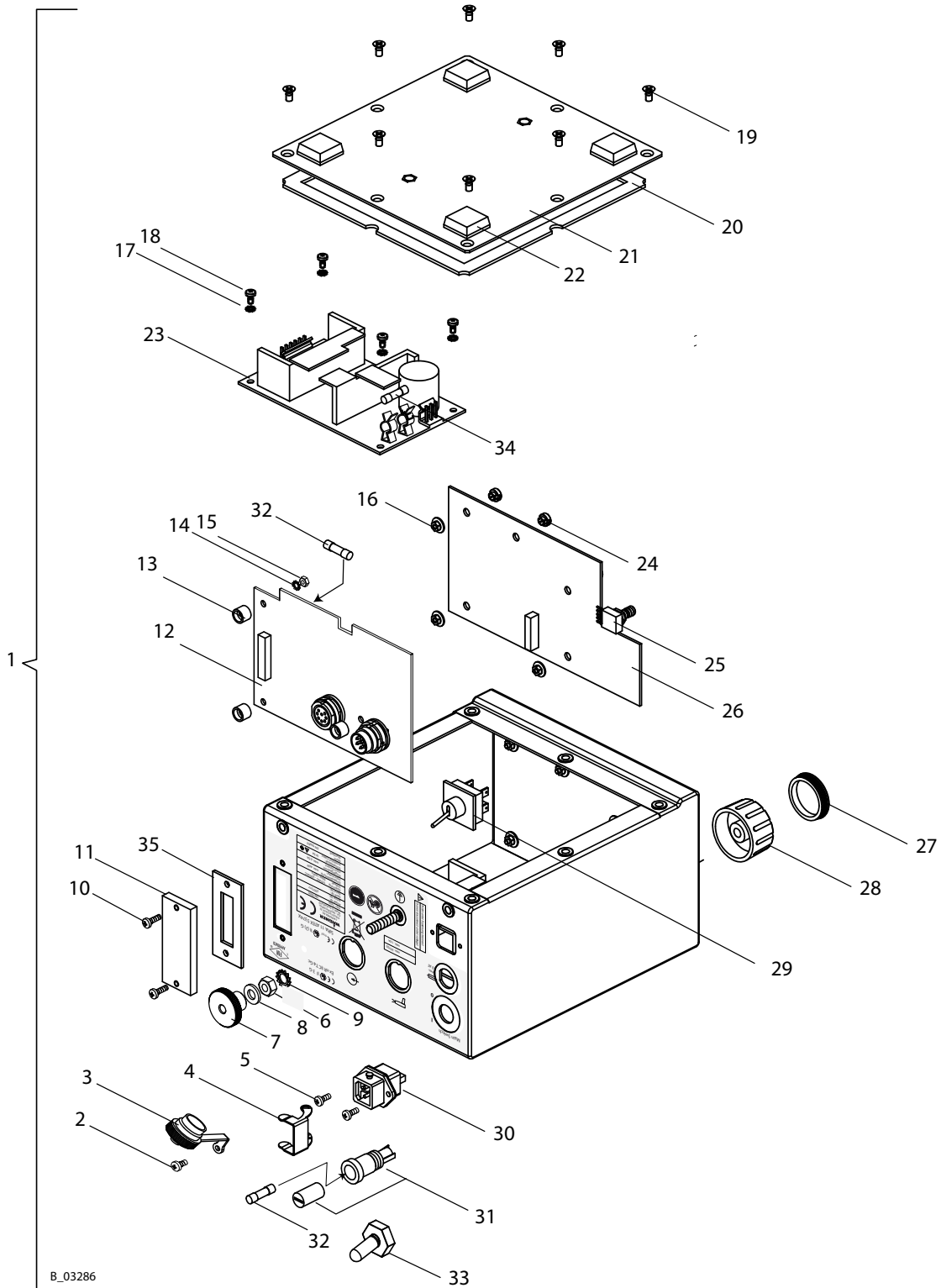
##### **Incorrect maintenance/repair!**

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 device.
- 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 5000 CONTROL UNIT**



B\_03286



Pos	Stk	Order no.	Designation
1	1	2310477	VM 5000 control unit
2	1	9903312	Recessed head raised fillister head screw, H form
3	1	9952593	Protection cap for device socket
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	2317538	Print VM 5000 rear panel, complete (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
25	1	2311875	Incremental encoder
26	1	2317539	Print, complete for VM 5000 display (with position 25)
27	1	2304462	Cover
28	1	2304461	Rotary knob
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
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
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EC Type Examination Certificate:

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

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

Spray gun: **CE**<sub>0102</sub>  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



# WAGNER



Document No. 11122754  
Version E

Order no. 2318718  
Edition 09/2018

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Subject to changes without notice