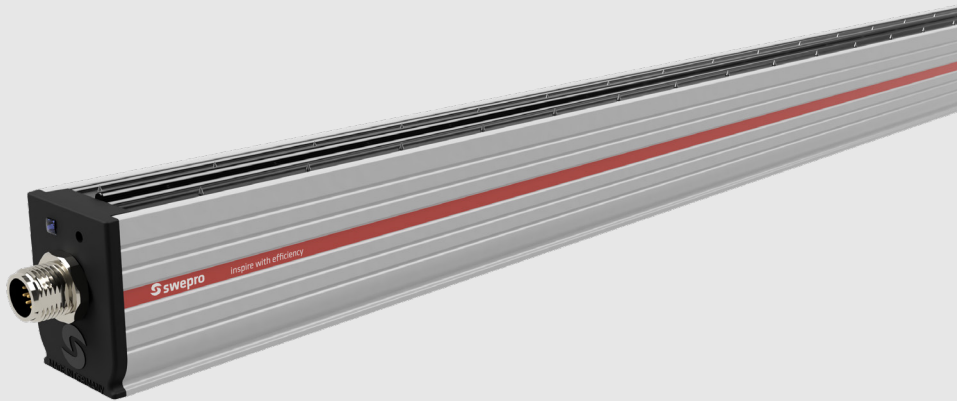


INSTRUCTION MANUAL:

swepro Ionic Antistatic-Products Zeus 4.0 DC series



In order to prevent injuries and damage, read this instruction manual thoroughly and carefully and keep it for future reference.

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1. INFORMATION REGARDING THE MANUAL

This instruction manual contains important notes and information regarding the intended use. This instruction manual must be kept close at hand for the operating personnel. This instruction manual must be read completely before this product is installed and put into operation.

Follow the instructions to ensure proper and safe operation of the product and to be able to assert warranty claims, if necessary.

The exact guarantee conditions are described in the General terms of business of Swedex GmbH Industrieprodukte.

1.1 PURPOSE OF THIS INSTRUCTION MANUAL

The present instruction manual familiarises the plant operator with the following items:

- Operating principle
- Operation
- Safety notes
- and maintenance

1.2 TARGET GROUP OF THE INSTRUCTION MANUAL

This instruction manual must be read and observed by every person in charge with one of the following tasks:

- Installation and assembly
- Operation
- Troubleshooting
- Disassembly and disposal

1.3 LAYOUT OF THE WARNING NOTICES

Warning notices are specially highlighted by coloured signal word fields. Always read the full text of the warning notice to protect yourself effectively against any hazards! The following signal word fields use different colours and signal words to indicate different danger levels:



Non-observance of this warning notice will result in severe or fatal injuries.



Non-observance of this warning notice may result in severe or fatal injuries.



Non-observance of this warning notice may result in minor or moderate injuries.



Non-observance of this warning notice may result in material damage.

Warning notices are always structured in the same way. They contain a signal word, type and source of danger, consequences in the case of non-observance as well as measures for averting / preventing the danger. Example:



Permanent noise

Severe hearing damage

- ▶ Always wear hearing protection during operation!
-

1.4 LAYOUT OF THE INSTRUCTIONS

Instructions directly request you to do something, they are structured in an action-oriented fashion. Always carry out the individual action steps in the prescribed order.

Instructions are structured as shown in the following and identified with corresponding symbols:

- ▶ Objective of the instruction
 1. Action step
 - ✓ Effect of the action step for checking whether or not the step has been carried out correctly.
 2. Further action step
- ✓ Result of the whole instruction

1.5 LAYOUT OF THE ADDITIONAL INFORMATION



The texts marked with an information symbol provide you with additional information and tips.

1.6 LAYOUT OF THE REFERENCES

References are shown in this manual as follows:

Example:

“... only operate the machine in accordance with its intended use (intended use).“

2. FOR YOUR SAFETY

The following items must be observed to prevent accidents and injuries:

- Follow all safety instructions and warnings in this manual.
- Observe hazard symbols, prohibition signs and signs giving orders.
- Adhere to the accident prevention rules and regulations applicable at the site of operation.
- Comply with all inspection and maintenance intervals.
- Observe the intended use.

2.1 GENERAL SAFETY INSTRUCTIONS

Safety instructions help you prevent injuries and material damage. Make sure that you have read and understood all safety instructions in this instruction manual. To ensure safe working, it is not sufficient to only read the general safety instructions in this chapter. Also read and follow the special safety instructions in all chapters relating to your work. Please also observe the notes in the further applicable information such as regulations, laws and guidelines, e.g the workplace ordinance [ArbStättV], etc.

The following safety instructions apply generally:

- Observe the national and international safety instructions on occupational safety applicable in each case.
- Only operate the antistatic products ...
 - › in technically perfect condition
 - › taking safety and risks into consideration and being aware of them
 - › in accordance with their intended use
 - › observing this instruction manual
- Wear the personal protective equipment.
- Work on electrical installations must only be carried out by qualified electricians. Work on live parts must only be carried out under supervision by a second person.
- Eliminate faults that affect your safety or safe operation of the antistatic products immediately. Put antistatic products out of service until the fault has been eliminated.
- When replacing components, use spare parts authorised by the manufacturer. Non-authorised spare parts can put the operational safety of the antistatic products at risk.
- Take potential residual energies in mechanical, pneumatic and electrical components into consideration.

2.2 INTENDED USE

The antistatic products must only be used in the context of the specifications given in the chapter “Technical data” and taking into account the maintenance instructions and notes in this instruction manual and in the documents supplied.

Antistatic products serve to dissipate the electrostatic charge from surfaces. Typical applications are for instance the discharge of paper webs in the printing industry, packaging production and plastics production. Antistatic products are used in any application in which the manufacturing of products is interfered due to electrostatic charge or where the presence of electrostatic charge causes situations that jeopardise occupational safety.

2.3 RESPONSIBILITIES AND OBLIGATIONS

In addition to the instructions and notes given in this instruction manual, generally valid, statutory provisions and other binding regulations for the prevention of accidents and for environmental protection must be observed.

To guarantee safe operation of the antistatic products, the operating company must at least ...

- ensure that the antistatic products are only operated in accordance with their intended use, in perfect condition and without any defects.
- define the site of operation and prepare corresponding operating instructions.
- ensure that the complete, legible instruction manual is always at hand at the antistatic products' site of operation.
- provide the necessary personal protective equipment (PPE) to the active staff.
- carry out a safety training on the antistatic product.
- provide for sufficient ventilation and lighting of the work areas.
- ensure that the antistatic products are not used in workplace environments for which an Ex certificate is required for reasons of explosion protection.

2.4 PERSONNEL QUALIFICATION

All works may be exclusively carried out by personnel qualified and authorised for this work. The term “qualified” means that personnel is trained, skilled or instructed with regard to the respective work and can verify this by furnishing corresponding certification or proof.

The following groups of persons are distinguished in this manual:

- Operating personnel is familiarised with the handling and operating mode of the antistatic products. Such persons enter the data required for operation and execute the necessary operating steps for operating the antistatic products. Furthermore such persons are responsible for basic maintenance operations.
- Set-up and maintenance personnel is responsible for commissioning and decommissioning as well as setting up and modifying the antistatic products.
- Trained electricians are responsible for all work on electrical components.



For persons with cardiac pacemakers there is the risk that touching several emission tips or moving the chest towards the antistatic bar may cause the pacemaker to switch to fault mode.

Superiors with corresponding expertise are responsible for commissioning and decommissioning.

Activity	Operating personnel	Set-up / maintenance personnel	Trained electrician	Plant manufacturer
Commissioning			x	
Switch-on	x			
Operation	x			
Troubleshooting		x		
Fault elimination, mechanical system		x		
Fault elimination, electrical system			x	
Set-up, installation		x		
Maintenance, mechanical system		x		
Maintenance, electrical system			x	
Repair		x		
Decommissioning, storage		x		

3. COMPONENTS AND FUNCTIONS

3.1 INTRODUCTION / PRODUCT DESCRIPTION AND OPERATING PRINCIPLE

Ionic Zeus 4.0 antistatic bars serve to dissipate the static electricity from surfaces. Typical applications are the discharge of paper webs in the printing industry, packaging production and plastics production. The bars are designed for both high speeds and the application in different working distances. The integrated high voltage cascade ensures increased safety to prevent accidents. The bar comes equipped with a monitoring LED and can also be operated and monitored via a serial interface. Ionic Zeus 4.0 antistatic bars can be manufactured in accordance with customer requirements. They are available from 465 mm to 3000 mm (in intervals of 150 mm). The bars feature a compact design and are delivered with a cross-section of 45 x 30 mm. With groove stones or a specific bracket along the bar, the antistatic bars can be mounted in a freely adjustable fashion. These flexible mounting options makes it possible to fasten them easily and quickly.

The Ionic Zeus 4.0 is supplied with the 24 V DC operating voltage via a standard M12 connector. The connector can be additionally used to access a serial interface for integration of the bars into the machine control.

The Ionic Zeus 4.0 can be ideally used for working distances between 10-500 mm with material speeds to be discharged of up to 8m/sec.

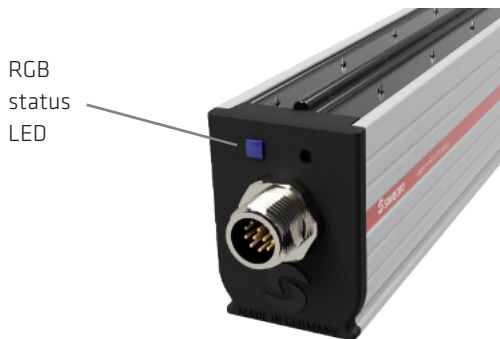


Fig. 1: Connection side of the Ionic Zeus 4.0

Inside the Ionic Zeus 4.0 , the connected operating voltage of 24 V DC is converted to a positive and negative high voltage of ± 8 KV. This high voltage generates an electric field on the emitter tips, splitting the air molecules around the emitter tips into positive and negative ions.

If a statically charged surface enters the bars' operating range now, an ion exchange takes place, neutralising the surface charge.

The "blue" status LED then indicates both the frequency set and that the bar is in operating mode. If the "red" status LED flashes, the bar is in fault mode. Fig. 1 shows the position of the status LED on the connection side.

If a frequency change takes place, the frequency can be altered using the switch. This option is intended for optimising the discharge process, in order to implement discharging even over longer operating distances (< 500 mm).

3.2 FUNCTION DESCRIPTION (BUTTON SETTING)

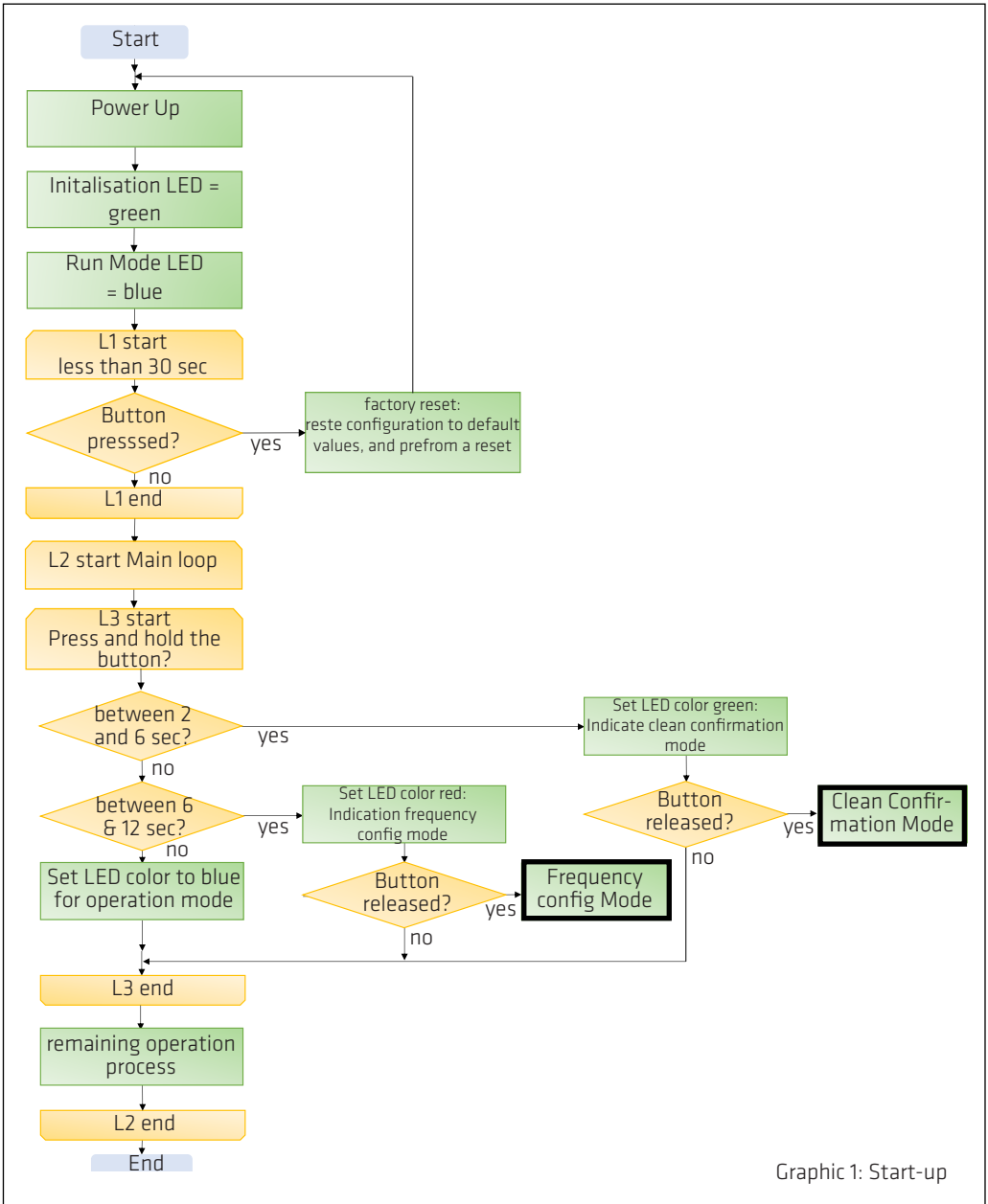
In the following digrams you will see how to adjust the cleaning function and the frequency of the bar using the button.

You can also use this button to reset the bar to factory settings.

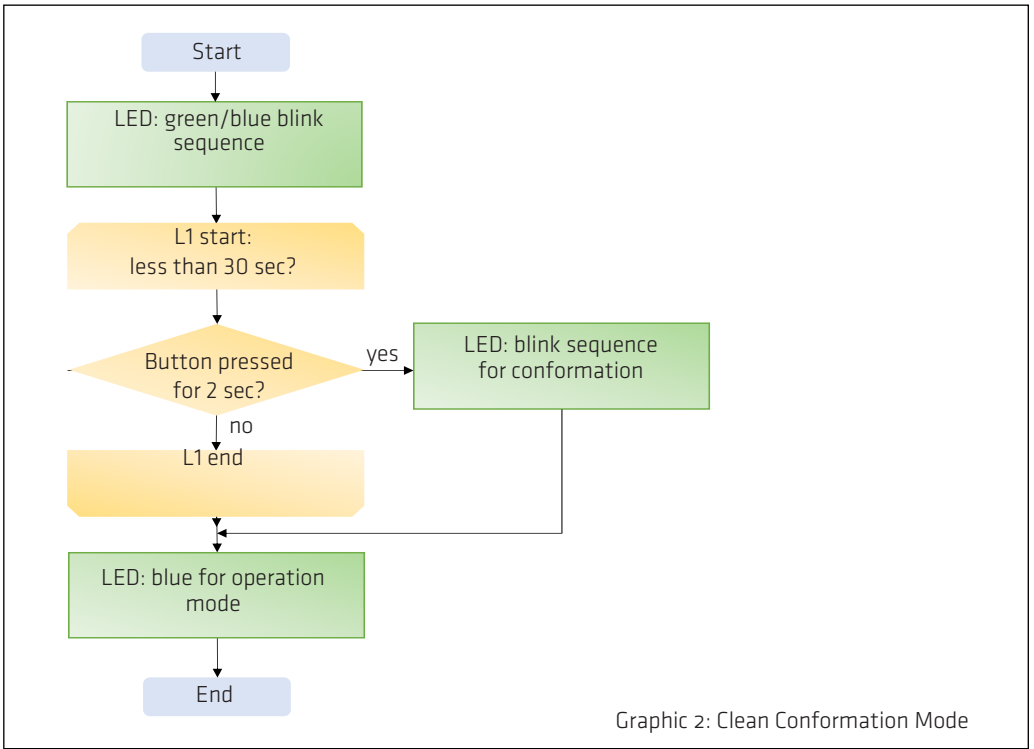
Graphic 1: Start-up (Page 13)

Graphic 2: Clean Conformation Mode (Page 14)

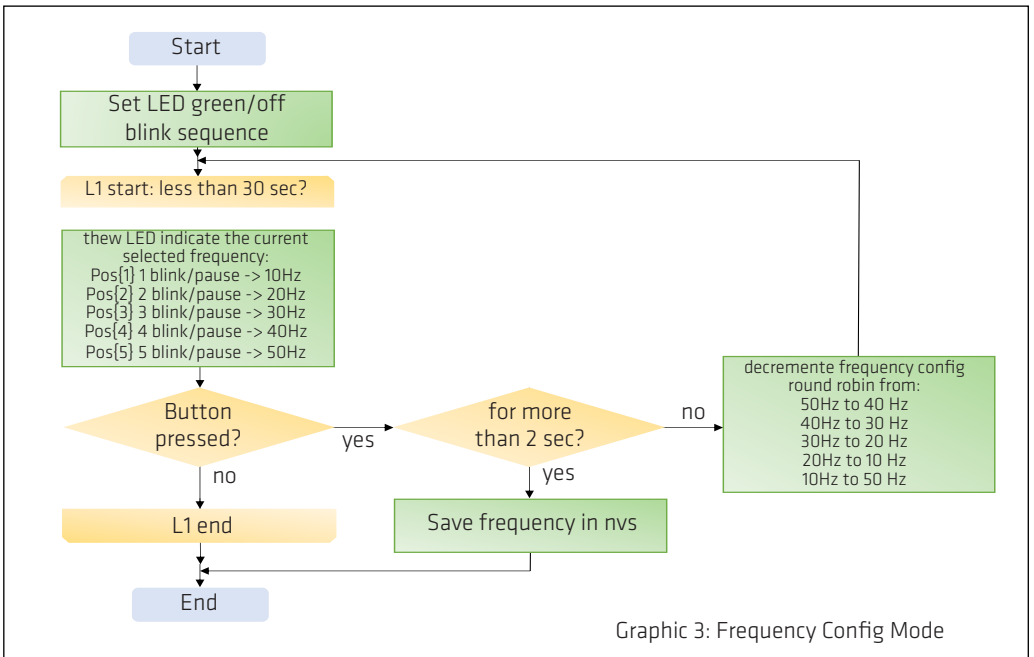
Graphic 3: Frequency Config Mode (Page 14)



Graphic 1: Start-up



Graphic 2: Clean Conformation Mode



Graphic 3: Frequency Config Mode

3.3 TECHNICAL DATA

Standard lengths	
Article No.:	Length:
945100	465 mm
945101	615 mm
945102	765 mm
945103	915 mm
945104	1065 mm
945105	1215 mm
945106	1365 mm
945107	1515 mm
945108	1665 mm
945109	1815 mm
945110	1965 mm
945111	2115 mm
945112	2265 mm
945113	2415 mm
945114	2565 mm
945115	2715 mm
945116	2865 mm
945117	3000 mm

Profile - Material	GFK-Plastic
Dimensions [WxH]	45x30

Power supply	SI DC- PU (article no.: 945000) or power supply unit (24V; 10 Watt) with an M12 connector
Operating voltage	24 V DC \pm 10%
Earthing	It is absolutely necessary to connect the negative pole of the supply voltage to protective earth (PE). Otherwise, the bar may be damaged.
In the case of the SI DC-PU, it is already integrated into the power supply unit. Article No.: 945000	230 V
Short-circuit voltage / emission tip / earth:	Max. 70 μ A with \pm 8 kV DC
Cable length	Available in pre-assembled condition
Connections	M12 connector 12-pole
Protection class	IP66

Output	
Output voltage	With 24 V DC max. \pm 8 KV (positive and negative)
Current between emitter and earth	Max. 70 μ A with 7 kV DC
Environment	
Temperature	Min. 0°C...+50°C (+32°F...+122°F)
Storage temperature	Min. 0°C...+80°C (+32°F...+176°F)
Material speed	Max. 8 m/sec
Operating distance	10-500 mm
For use in	Industrial applications
Protection class	IP66

LED display	
Blue (flashing interval)	Frequency setting
	10 Hz flashing 1x .-.
	20Hz flashing 2x .--.
	30Hz flashing 3x .---.
	40Hz flashing 4x .----.
	50Hz flashing 5x .-----.

Mechanical	
Effective length	465-3000 mm [L]
Dimensions	45 x 30 x (L) [H X W X L]
Weight	1,9 kg/m
Housing	Glass fibre reinforced plastic
Mounting options	Groove stones or mounting bracket
Emitter tip distance	1/30 mm (positive to negative 15 mm)
Air connection	N/A

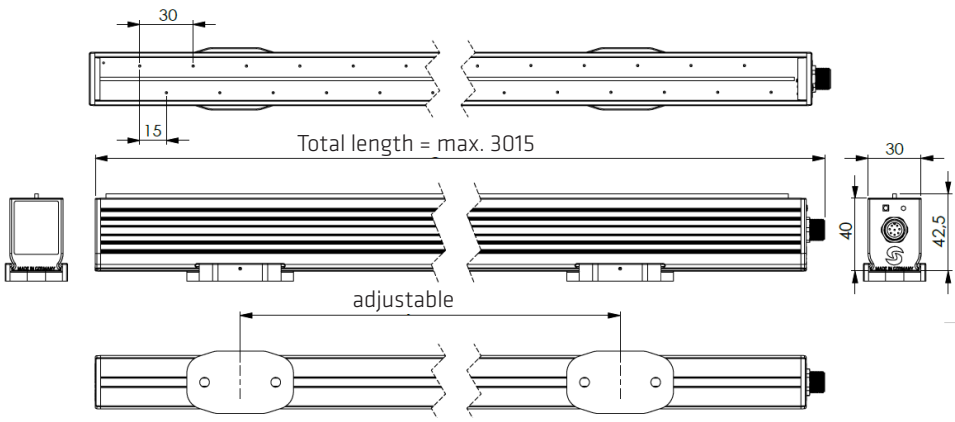


Figure 2: Installation and assembly

4. SAFETY



WARNING

Work on electrical installations

Severe or fatal injuries due to dangerous electrical voltage

- ▶ Work or repairs on electrical installations only by electrically skilled persons!
- ▶ The power supply of the bars must only be operated via an earthed NEC class 2 power supply unit or an earthed LPS power supply unit.
- ▶ Switch off the device and secure it against restart!
- ▶ The device must be properly earthed.
- ▶ Only carry out work on live parts under supervision by a second person!
- ▶ Check electrical components for any residual charge!



WARNING

Damaged or torn hose lines

Injuries caused by air escaping under pressure or by whipping hoses

- ▶ Only use undamaged hose lines designed for the corresponding pneumatic pressures!
 - ▶ Do not lay hose lines across sharp edges, do not bend the hose and do not use it to draw any connected components!
 - ▶ Maintain the intervals for maintenance and replacement of hose lines!
-

4.1 CONNECTION AND ASSEMBLY OF THE IONIC ZEUS

4.0 ANTISTATIC BAR

- Please observe the following steps when fitting cables.
1. Connect standard M12 connector incl. pre-assembled cable (see article no. 945000) accordingly to the M12 socket on the bar.
 2. When using on-site voltage sources, it is absolutely necessary to connect the negative pole of the supply voltage (PIN5) to PE, since this is the electrical centre of the high voltage cascade. Non-observance of this step can destroy the assembly.
 3. Tighten the screw connection of the M12 plug hand-tight.

The PIN assignment of the bar is described as follows:

PIN	Function
1	CAN Low
2	RS232 TX
3	RS232 RX
4	+24 V DC
5	GND_HV
6	GND
7	PE
8	CAN_GND
9	CAN High
10	OUT
11	Boot
12	COM

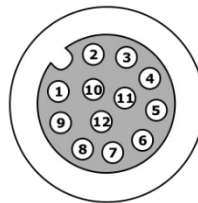


Figure 3: PIN assignment of the M12 connection socket



CAUTION

In the range of \varnothing 500 mm around the bar, conductive or earthed machine parts have a negative impact on the discharge capacity.

Voltage supply of the Ionic Zeus 4.0 antistatic bar can also be ensured by a power supply system already installed or by a 24 V DC machine voltage. The criteria mentioned above must be met, though. However, we recommend using the swepro power supply unit SI DC-PU power supply unit (24 V) (article no.: 945000).

We also recommend checking the device for signs of damage before the installation. In the case of any inconsistencies, please contact us or your person in charge.

The ion bars should be installed exactly downstream of the point that is statically charged. In this process, the Ionic Zeus 4.0 antistatic bar should be positioned in your optimum work area from the surface to be neutralised.

This area is located at a working distance of 10-500 mm.

The emitter tips should point in the direction of the surface to be discharged.

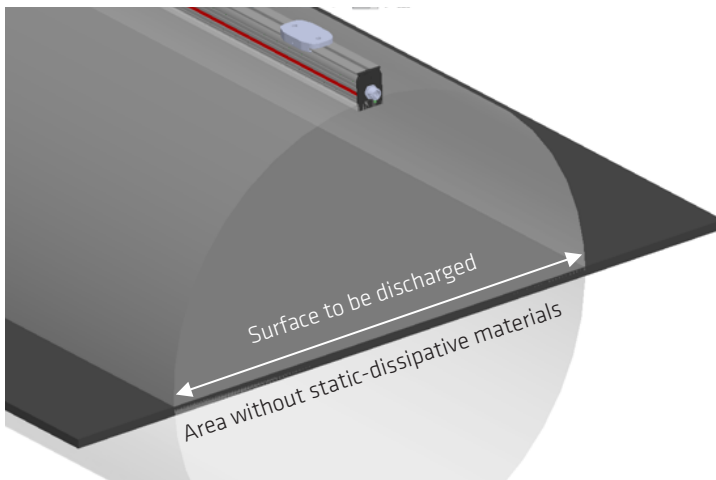


Fig. 4: Free area

4.2 COMMISSIONING / RECOMMISSIONING

Before connecting the devices or putting them back into operation, please make sure that the bar is working properly. In order to check this, start up the bar immediately upon connection of the power supply. When this start-up has been successful, the blue function LED should flash. When the device is overloaded, the blue LED goes out and the red LED flashes. This means that the bar is in fault mode. A list of the various faults is provided in the fault table in chapter 6.2.

In this case, we recommend cleaning the emitter tips first, using a dry scrubbing brush to eliminate the fault, when indicated.

5. MAINTENANCE OF THE IONIC ZEUS 4.0

Maintenance comprises all measures to maintain, restore or ensure the safe state as well as the functionality.

This includes:

- Maintenance work to maintain the functionality
 - Cleaning work (we recommend at least one weekly check of the status LED to be able to ensure constant performance. Cleaning should at least be carried out every six weeks.)
- Inspection for determining signs of wear
- Corrective maintenance as repair or replacement of defective components

5.1 SAFETY



WARNING

Work on electrical installations

Serious or fatal injuries due to dangerous electrical voltage

- ▶ Work on electrical installations only by electrically skilled persons!
 - ▶ Switch off the antistatic products and secure them against re-start!
-

For carrying out maintenance and repair work, please also observe the following safety instructions:

- Before carrying out any maintenance and repair work, the system must be disabled by a skilled electrician (switched to a deenergised state).
- Maintenance and repair work must only be carried out by maintenance personnel.
- Only use suitable tools.
- Wear your personal protective equipment when carrying out any maintenance and repair work.

5.2 MAINTENANCE WORK



Working on electrical installations

Serious or fatal injuries due to dangerous electrical voltage

- ▶ Work on electrical installations must only be carried out by a qualified electrician.
 - ▶ Switch off the antistatic products and secure them against restart!
-



Equipment damage by incorrect maintenance

- ▶ Antistatic products must never be immersed in liquids during operation.
-

All high-voltage products are sensitive to humidity and all other conductive contaminants, since, sooner or later, this would cause faults due to the formation of leakage currents and affect the performance of the antistatic products.

Only antistatic products that are properly maintained and cleaned can achieve the full ionisation effect. To ensure that antistatic products are operated with the correct voltage, voltage measurements can be carried out by means of a SI HVP high-voltage probe and a multimeter.

Maintenance and cleaning of the antistatic products should be carried out at least every 6 weeks. In heavily contaminated environments as well as environments with a high humidity, the cleaning interval should be reduced.

For this purpose, the antistatic bars should be cleaned with a suitable detergent and a suitable tool. (Example.: isopropyl and a scrubbing brush)

In the case of heavy contamination, a brush with correspondingly soft bristles should be used.

6. MALFUNCTIONS

6.1 SAFETY



Working on electrical installations

Serious or fatal injuries due to dangerous electrical voltage

- ▶ Work on electrical installations must only be carried out by qualified electricians!

6.2 FAULT TABLE

Problem	Cause	Solution
No LED is lit		
	No high voltage on the emitter tips	<ul style="list-style-type: none">• Check the voltage supply• Check the fuse• Check the connection cable
	Light-emitting diodes defective	Restart the bar, if just one LED is not responding, send in the bar for inspection.
Red LED is flashing		
2 x red/off blink sequence	heavily soiled ioniser	switch off, ioniser has to be cleaned
4 x red/off blink sequence	Short on positive ioniser size	switch off the bar an chk the ioniser surface
5 x red/off blink sequence	Short on negative ioniser size	switch off the bar an chk the ioniser surface
6 x red/off blink sequence	Short on both ioniser size	switch off the bar an chk the ioniser surface
7 x red/off blink sequence	positive cascading frequency error	restart bar

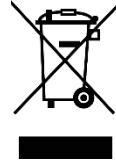
8 x red/off blink sequence	negative cascading frequency error	restart bar
10 x red/off blink sequence	over temperatur	switch off the bar and check the enviroment conditions
constant red	internal fault	please contact support
2 x red/blue blink sequence	warning because of soiled ioniser	ioniser has to be cleaned
4 x red/blue blink sequence	warning power on positive ioniser side is to high	chk the ioniser surface
5 x red/blue blink sequence	warning power on negative ioniser side is to high	chk the ioniser surface
Insufficient discharge performance		
	Emitter tips must be cleaned	Switch off the bar and clean.
	Emitter tips are worn	Check the tips and check the working distance, if necessary.
	Emitter tips too close to earthed components	Reconsider the mounting position and re-install, if necessary.
	Emitter tips too far away from surface to be discharged	Reconsider the mounting position and re-install, if necessary.
	Do not install the bar opposite static-dissipative materials	Reconsider the mounting position and re-install, if necessary. The surface to be discharged should be in a free area.

7. DISPOSAL

After the final disassembly of the Ionic Zeus 4.0 antistatic bar, the operating company must dispose of all materials and components used, complying with the regulations in force in the corresponding operating country.

Special diligence is required for the disposal of environmentally harmful materials, e.g.:

- Plastic parts
- Rubber parts
- Electrical parts
- Operating and auxiliary materials



As manufacturer of electrical devices (B2B), Swedex GmbH Industrieprodukte offers its customers free-of-charge disposal of the products manufactured and distributed under the brand "swepro". Our electrical devices up to 8 kV are labelled with the crossed-out dustbin symbol in accordance with Annex 3 ElektroG (Electrical and Electronic Equipment Act).

The instruction manual of the delivered product already provides our customers with information about the possibility of disposal. Our customer can announce the return via e-mail to service@swepro.de, using the contact form on our website <https://www.swepro.com/> or via our contact person in the sales department. Swedex GmbH Industrieprodukte will bear the costs of disposal for electrical devices of the brand "swepro". After sending the product in, the electronic waste will be collected, sorted by the type of reusable material and delivered at regular intervals to our partners dealing with recyclable materials.

The device must not be disposed of with your domestic waste. Therefore, hand the device in at an approved collection point or dispose of it in accordance with statutory provisions. You are therefore making an active contribution to environmental protection.

8. FEEDBACK

Please do not hesitate to send us your questions, proposals and criticism regarding our product or the present documentation:



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Thank you very much for your support!