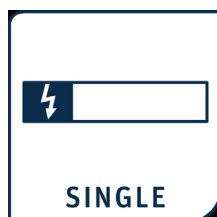


# Operating Instructions



RX3\_re



## ionSTAR

Discharging Bar Series RX3 for 24 V DC

BA-en-2058-2402





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## Dear customer,

The high performance discharging bar ionSTAR series RX3 are used mainly in cases where disruptive static charges need to be eliminated over great distances.

The advantages of the RX3 discharging bars:

- integrated high voltage generation
- high output voltage for ultimate discharge range
- non-wearing emission tips
- shockless - no danger of electrical shock to personnel
- robust design
- easy assembly
- function and fault monitoring with floating signal contacts
- automatic distance measurement with discharge optimization (depending on the version)

Please read the operating instructions carefully before operating the unit. This will help you prevent personal injuries and damage to property.

Please give us a call if you have any suggestions, proposals or ideas for improvements. We greatly appreciate the feedback from the users of our appliances.

## 1. Outline of appliance

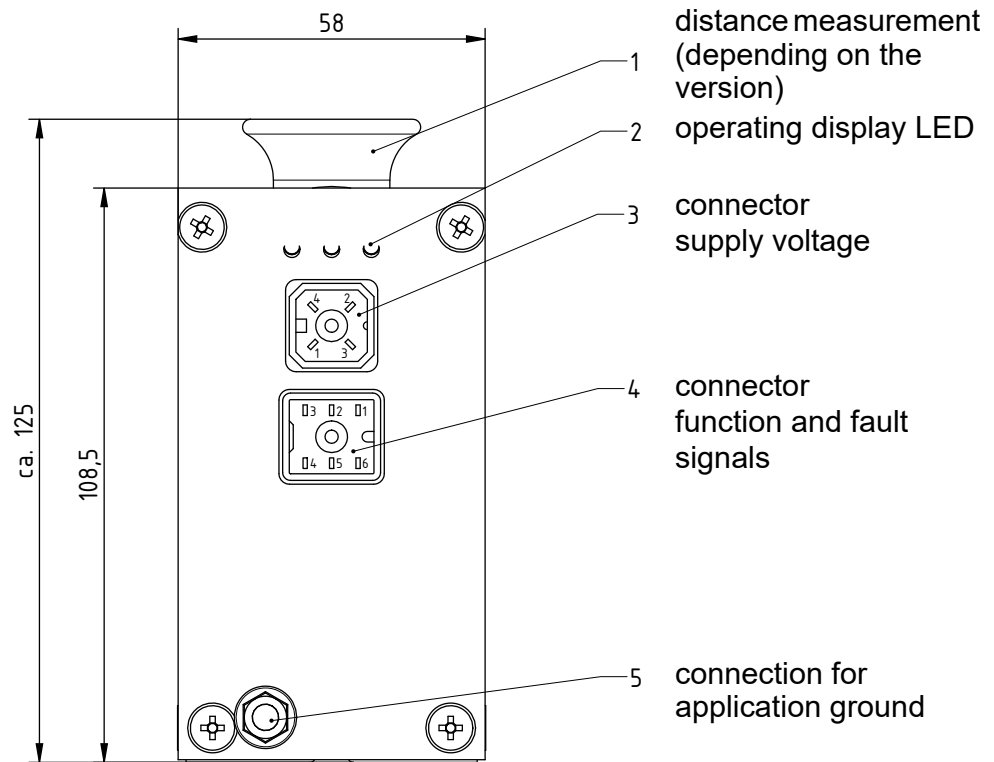


Fig. 1:  
Overview of the  
RX3  
discharging bar

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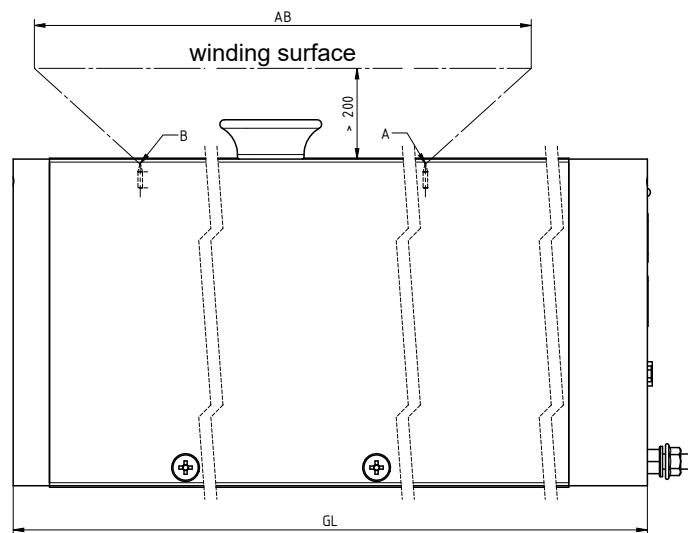


Fig. 2:  
RX3  
discharging bar

AB = working width  
GL = total length

A = first tip  
B = last tip

Z-109988c\_2

## 2. Safety

The units have been designed, built and tested using state-of-the-art engineering, and have left the factory in a technically and operationally safe condition. If used improperly, the units may nevertheless be hazardous to personnel and may cause injury or damage. Read the operating instructions carefully and observe the safety instructions.

For warranty conditions, please refer to the General Terms and Conditions (GTC), see [www.eltex.de](http://www.eltex.de).

### 2.1 Identification of risks and hazards

Possible risks and hazards resulting from the use of the units are referred to in these operating instructions by the following symbols:



#### **Warning!**

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in serious personal injuries.



#### **Caution!**

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in damage to property.

### 2.2 Contact protection

The site of installation and/or use of the units is outside the control of Eltex, contact protection against inadvertent contact of the bars and of live components by personnel as specified by the employer's liability insurance association may have to be provided (e.g. DGUV V3 in Germany). Contact protection devices made of conductive material must be grounded.

### 2.3 Inspection of the protective resistors - contact protection

The function and the appearance of the protective resistors must be inspected at regular intervals. The inspection intervals are specified in the accident prevention regulations, as amended (e.g. in Germany DGUV V3).

The function of the series resistors must be checked using a suitable measuring device. The test voltage must be 1,000V. The measured resistance between two emission tips of the same tip row must not fall below 240 MOhm and not exceed 360 MOhm.

## 2.4 Technical advance

The manufacturer reserves the right to make changes to the technical specifications without prior notice in order to adapt the units to state-of-the-art engineering. Eltex will provide the latest information on any changes or modifications in the operating instructions on request.

## 2.5 Proper Use

The Series ionSTAR discharging bars must be used only for discharging static charges from material surfaces. Other uses are not permitted.

Other uses are not permitted. The manufacturers will not assume any liability and warranty if the units are used improperly or used outside the intended purpose.

Modifications or changes made to the devices are not permitted.

Use only original Eltex spare parts and equipment.

## 2.6 Work and operational safety



### Warning!

Carefully observe the following notes and the complete [chapter 2 "Safety", page 7!](#)

- If a conductive substrate (e.g. composite film material with aluminium coating) is processed under EX atmosphere in the unit in which the RX3 is installed or if a conductive coating (e.g. metallic inks) is applied or printed, the RX3 must be de-energised.
- Before carrying out repairs, cleaning or maintenance work and before resetting after malfunctions, switch off the unit and disconnect the mains supply voltage (see [chapter 5 "Maintenance", page 16](#), Before carrying out any work involving the units, the machine which has the units fitted must not be in operation (see [chapter 5 "Maintenance", page 16](#), [chapter 6 "Troubleshooting", page 17](#)).
- Before carrying out any work involving the units, the machine which has the units fitted must not be in operation (see [chapter 5 "Maintenance", page 16](#), [chapter 6 "Troubleshooting", page 17](#)).
- Any work involving the units must be carried out by qualified electricians (see [chapter 5 "Maintenance", page 16](#), [chapter 6 "Troubleshooting", page 17](#)).
- The bars passively absorb energy from the moving substrate web. The high voltage cable must be plugged in or grounded to the power supply. If the high voltage cable is disconnected, the plug is live (high voltage) and applies with full power on the plug; this may cause a spark discharge and may lead to a risk of injury. Disconnected high voltage plugs are not permitted or have to be grounded (see [chapter 5 "Maintenance", page 16](#)).



- The bar must be mounted such that mechanical damage to the bar tips is ruled out (see [chapter 3.1 "Assembling the discharging bar", page 11](#)).
- When routing the cable, select the attachment points such that mechanical damage to the cable (e.g. chafing against rotating machine parts) is ruled out (see [chapter 3.1 "Assembling the discharging bar", page 11](#)).
- In applications involving moving bars, the cable must be attached such that there is no cable movement near the connection zone of the bar (see [chapter 3.1 "Assembling the discharging bar", page 11](#)).
- No objects of conductive grounded material must be mounted within a minimum distance of 260 mm from the tip array (Fig. 4). A cylindrical space with the radius R of the bar distance to the web ought to be kept free of any conductive material (see [chapter 3.1 "Assembling the discharging bar", page 11](#)).
- The discharging bar must be aligned such that it is mounted centered in relation to the reel core or - depending on the type of mounting - perpendicular to the material web (see [chapter 3.1 "Assembling the discharging bar", page 11](#)).
- The operation of the discharging bar RX3 requires a 24V DC supply designed for a maximum current of 3 A (see [chapter 3.2 "Connecting supply voltage and connector", page 13](#)).
- To ensure that no voltage is supplied to the bars when the material web is at rest, enabling the supply voltage to the unit via machine contact is recommended. If the material web is at rest, or if the machine is not in operation, no high voltage is supplied to the bars in this case (see [chapter 3.2 "Connecting supply voltage and connector", page 13](#)).
- A permanent ground connection must be made via the grounding terminal over the shortest possible distance to the conductive machine contact (6, Fig. 1). A grounding cable with a conductor cross-section of 10 mm<sup>2</sup> and a maximum length of 1 meter is required for trouble-free operation (see [chapter 3.3 "Ground connection", page 13](#)).
- The connector for function and fault signals must be attached even if the connector has not been connected. Contact 4, 5 and 6 are assigned internally and **must not** be used (see [chapter 3.4 "Connecting socket for function and fault signals", page 14](#)).
- The discharging bars must be operated with a 24 V DC power supply (see [chapter 4 "Operation", page 15](#)).
- Mechanical or electrical modifications of the discharging bars are not permitted.
- Check the units at regular intervals and before startup for any damage. Any damaged components must be repaired or replaced before continuing to operate the unit, or the units must be disabled.

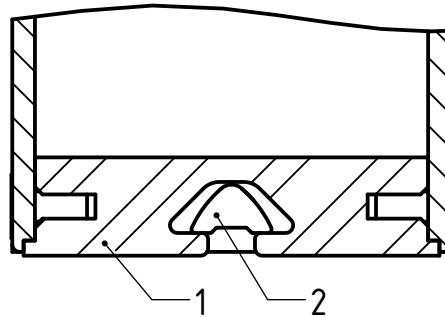
- Make sure that the units are clean at all times.  
Dirt results in malfunctions and in premature wear of the units.
- When cleaning the bars do not soak the bars and the high voltage cable in solvent and do not damage the emission tips; allow the solvent to evaporate completely before restarting the unit (see [chapter 5 "Maintenance", page 16](#)).
- Do not touch the emission tips - risk of injury.  
If the high voltage supply is connected, reflex responses to electrical irritation can lead to secondary accidents, especially in the vicinity of unguarded rotating assemblies. The charging bar as such is safe to touch. If contact is made, the energy transferred is so low that there is no risk of injury.
- Potential risk for wearers of cardiac pacemakers:  
Moving the chest closer than 3.5 cm to the emission tips of the discharging bars or making surface contact with several emission tips (touching a single tip is not critical) can result in a temporary switchover of the cardiac pacemaker into the fault mode. Permanent proximity or contact can therefore cause severe problems.  
If it is likely that the chest of such a person comes closer than 3.5 cm to the emission tips of the discharging bar, or if several emission tips are touched at the same time, the appropriate warning notices must be displayed.
- During operation of the devices, small amounts of ozone (O<sub>3</sub>) may be produced at the emission tips depending on a variety of boundary conditions such as site of installation, bar voltage and current, air circulation, etc.  
If the maximum allowable concentration of ozone must be observed at the site of installation of the bar, the concentration must be measured on site.

### 3. Installation and assembly

#### 3.1 Assembling the discharging bar

Attach the Series RX3 discharging bars to the machine wall. For easier installation we recommend using the assembly material offered by Eltex. Fig. 3 shows the installation principle.

Fig. 3:  
Assembling the  
discharging bar



- 1 aluminum profile
- 2 slot nut M6

Z-109988c\_3

The profiled assembly section of the discharging bar is grooved. The slot nuts pushed into this groove serve as bolt attachments for the discharging bar.

Max. bolt depth 9.5 mm

Torque 14 Nm



#### Caution!

Evenly space the slot nuts across the full length.

below 1 meter total length: 2 per bar

below 2 meters total length: 3 per bar

over 2 meters total length: 4 per bar



#### Warning !

For safety in operation, please note the following:

- The bar must be mounted such that mechanical damage to the bar tips is ruled out.
- When routing the cable, select the attachment points such that mechanical damage to the cable (e.g. chafing against rotating machine parts) is ruled out.
- In applications involving moving bars, the cable must be attached such that there is no cable movement near the connection zone of the bar.

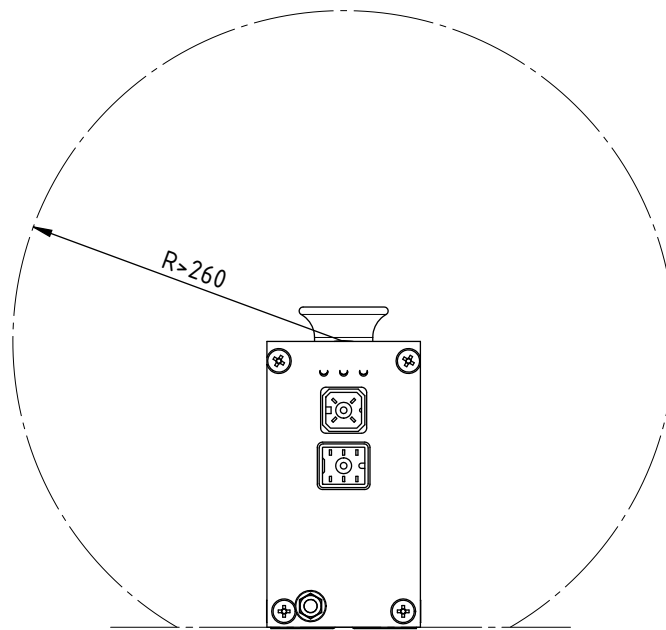
## Locating the discharging bar

The best possible discharging results are achieved if the bar is located in areas with minimum web capacities. In practical terms this means placing the bar with maximum distances from the machine environment, i.e. no discharging against the idler roller.

A rough guideline:



No objects of conductive grounded material must be mounted within a minimum distance of 260 mm from the tip array (Fig. 4). A cylindrical space with the radius R of the bar distance to the web ought to be kept free of any conductive material (Fig. 4).



*Fig. 4:  
Zone free of con-  
ductive grounded  
material around  
the discharging  
bar*

Distance frontal: min. 60mm!

Z-10998d\_4

## Alignment of the discharging bar

Depending on application, the distance between discharging bar and substrate ought to be 200...800 mm.

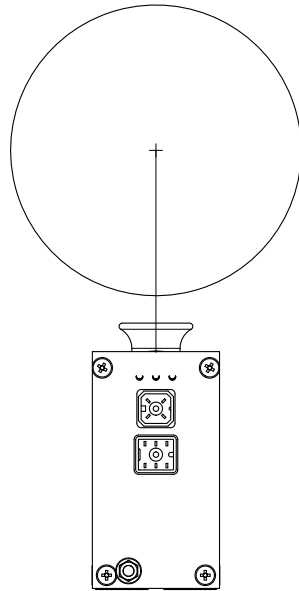


Fig. 5:  
Cylindrical zone  
free of conductive  
material at a  
distance  $R$

ZZ-109988d\_5



The discharging bar must be aligned such that it is mounted centered in relation to the reel core or - depending on the type of mounting - perpendicular to the material web.



### 3.2 Connecting supply voltage and connector

The operation of the RX3 discharging bar requires a 24V DC supply designed for a maximum current of 3 A.

The supply voltage is to be supplied by the customer and is connected via the connector plug supplied. Alternatively, the optional power supply unit may be used.

To ensure that no voltage is supplied to the bars when the material web is at rest, enabling the supply voltage to the unit via machine contact is recommended. If the material web is at rest, or if the machine is not in operation, no high voltage is supplied to the bars in this case.



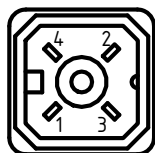
### 3.3 Ground connection

A permanent ground connection must be made via the grounding terminal over the shortest possible distance to the conductive machine contact (6, Fig. 1). A grounding cable with a conductor cross-section of 10 mm<sup>2</sup> and a maximum length of 1 meter is required for trouble-free operation.

### 3.4 Connecting socket for function and fault signals

A 4-pin connector for the supply voltage (Fig. 6) and a 6-pin connector for the function and fault signals (Fig. 7) are available.

Fig. 6:  
Connector  
supply voltage

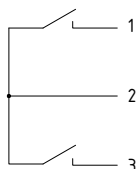
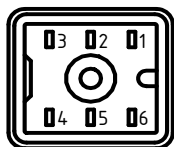


PIN 1: do not connect  
PIN 2: +24 V DC  
PIN 3: Ground  
PIN 4: do not connect

Z-109988c\_6

The supply voltage of 24 V DC has to be connected to the supply connector at the contact 2 (24 V) and the contact 3 (ground) resp. to the optional power supply.

Fig. 7:  
Assignment of the  
connector for func-  
tion and fault sig-  
nals (contacts at  
rest)



PIN 1: Warning  
PIN 2: COM  
PIN 3: Error  
PIN 4: do not connect  
PIN 5: do not connect  
PIN 6: do not connect

Z-109988c\_7+8

If required, the following floating signals (max. contact load 24V / 0.5 AC/DC) may be taken off the connector for function and fault signals:

- **Warning:**  
Contact 1 to contact 2 (COM) open  
(no Warning: contact closed)
- **Malfunction:**  
Contact 3 to contact 2 (COM) open  
(no malfunction: contact closed)
- **No line voltage:**  
(both contacts open.)
- **Caution!**  
Contact 4, 5 and 6 are assigned internally and **must not** be used!



#### Caution!

The connector for function and fault signals must be attached even if the connector has not been connected.

## 4. Operation



The discharging bars must be operated with a 24 V DC power supply.

### 4.1 Startup

Once all the connections have been correctly made, the system is operational and the supply voltage can be switched on.

### 4.2 Function monitoring

The proper function of the unit is signaled via the LEDs in the connection zone.

- During startup, all three LEDs (green, yellow, red) of the discharging bar must light up briefly.
- The green LED lights up as soon as the discharging bar is operational.
- Brief disruptions (1/2 second) of the green LED at 10 second intervals are possible; the discharging bar otherwise operates continuously.
- The yellow LED signals warning messages:
  - LED off: optimum working range
  - LED flashing in 1/2 second cycles:  
Distance current working range < 350 mm
  - LED flashing in 3 second cycles:  
Distance current working range > 700 mm

The discharging bar continues to operate without disruption;  
the desired discharging power may not be reached.
- The red LED lights up or flashes as soon as a malfunction is detected.

#### **Note!**

Malfunctions are not saved. The disruption of the supply voltage automatically cancels the malfunction message.

### 4.3 Function control

Use the Eltex Volt Stick or a glow-lamp voltage tester to check the proper function of the emission points. Quote Article No. 109136 when ordering the Volt Stick from Eltex.

## 5. Maintenance



### Warning!

Electric shock hazard!

- Do not carry out any maintenance or repair work without first disconnecting the supply voltage of the units.
- The machine which has the units fitted must not be in operation.
- The bars passively absorb energy from the moving substrate web. The high voltage cable must be plugged in or grounded to the power supply. If the high voltage cable is disconnected, the plug is live (high voltage) and applies with full power on the plug; this may cause a spark discharge and may lead to a risk of injury. Disconnected high voltage plugs are not permitted or have to be grounded.
- Repairs and maintenance work must be carried out by qualified electricians only.

To ensure the trouble-free function of the discharging bars, clean the bars regularly depending on pollution with compressed air free of oil and water (max.  $6 \times 10^5$  Pa and standard compressed air pistol) and a brush with soft plastic bristles (see [chapter 9 "Spare parts and accessories", page 21](#)).

Clean grease, ink, glue, paper dust, etc. off the discharging bar and the distance detection using a suitable solvent (benzine). Do not soak the bars and the high voltage cable in solvent!



### Caution!

Do not damage the emission tips when cleaning. Brush only in longitudinal direction.



### Warning!

Risk of deflagration!

Allow the solvent to evaporate completely before restarting the unit.

### Inspection of the protective resistors

The function and the appearance of the protective resistors must be inspected at regular intervals. The inspection intervals are specified in the accident prevention regulations, as amended (e.g. in Germany DGUV V3).

The function of the series resistors must be checked using a suitable measuring device. The test voltage must be 1,000V. The measured resistance between two emission tips of the same tip row must not fall below 240 MOhm and not exceed 360 MOhm.



## 6. Troubleshooting



### Warning!

Electric shock hazard!

- Do not carry out any maintenance or repair work without first disconnecting the supply voltage.
- The machine which has the units fitted must not be in operation.
- Repairs and maintenance work must be carried out by qualified electricians only.

Malfunction	Cause	Measure
red LED flashing	<ul style="list-style-type: none"> <li>• Dirty bar.</li> <li>• Sparking against metallic machine parts.</li> <li>• Serious source of EMC interference in the vicinity of bar or power supply units</li> </ul>	<ul style="list-style-type: none"> <li>• Clean bar (see chapter Maintenance).</li> <li>• Check installation situation.</li> <li>• Locate and rectify the source of interference, if necessary take measures to suppress interference</li> </ul>
red LED on	<ul style="list-style-type: none"> <li>• Internal error.</li> </ul>	<ul style="list-style-type: none"> <li>• Acknowledge the malfunction; disconnect the supply voltage and restart the unit.</li> <li>• If the malfunction recurs, send the unit for repair.</li> </ul>
No LED on	<ul style="list-style-type: none"> <li>• Supply voltage not enabled or not connected.</li> <li>• Defective internal fuse.</li> <li>• Defective LED.</li> </ul>	<ul style="list-style-type: none"> <li>• Check supply voltage, connections and connected cables.</li> <li>• Acknowledge the malfunction; disconnect the supply voltage and restart the unit.</li> <li>• If the malfunction recurs, send the unit for repair.</li> </ul>

## 7. Technical specifications

<b>Input</b>	
Supply voltage	24 V DC $\pm 10\%$
Current Input	max. 3 A
Power input	max. 55 W
Recommended protection	4A Tripping characteristic C
<b>Connectivity</b>	
Interfaces	digital 2 potential-free contacts: function and fault
<b>Output</b>	
Voltage	$\pm 40$ kV
Short-circuit current/tip	max. 0.45 mA
Frequency	2 - 10 Hz, depending on the distance to the product min. distance: 35 cm - 10 Hz max. distance: 70 mm - 2 Hz
High voltage generation	internal, cascade
<b>Features</b>	
Ionenbalance	fixed setting
Pollution monitoring	existing
<b>Key data</b>	
Bar element	glass-fiber reinforced plastic GRP
Encapsulation material	polyurethane, UL94 V-0
Emission tips	tungsten
Installation material	slot nut M6
Operating ambient temperature	+5...+40 °C (+41...+104 °F)
Ambient humidity	max. 70 % RH, non-dewing
Storage temperature	-20...+70 °C (-4...+158 °F)



Key data	
Protection class	IP40 according to EN 60529
Contact protection	according to EN 61140
Available active lengths	843 - 3008 mm in 240 mm steps
Operating distance	200 - 800 mm
Fault signal output	24 V DC $\pm 10\%$ , max. 0,05 A (internal fuse)
Measuring range ultrasonic sensor	350 - 700 mm optional: version with factory-set distance
Function and fault monitoring signals	2 floating contacts, max. 24 V / 0,5 A DC/AC LED in the connecting plate: green LED: high voltage active red LED: malfunction yellow LED: warning
Application ground	grounding terminal at the housing
Dimensions	108.5 mm x 58 mm x total length max. length 3008 mm
Weight	approx. 5.5 kg/m

## 8. Dimensions

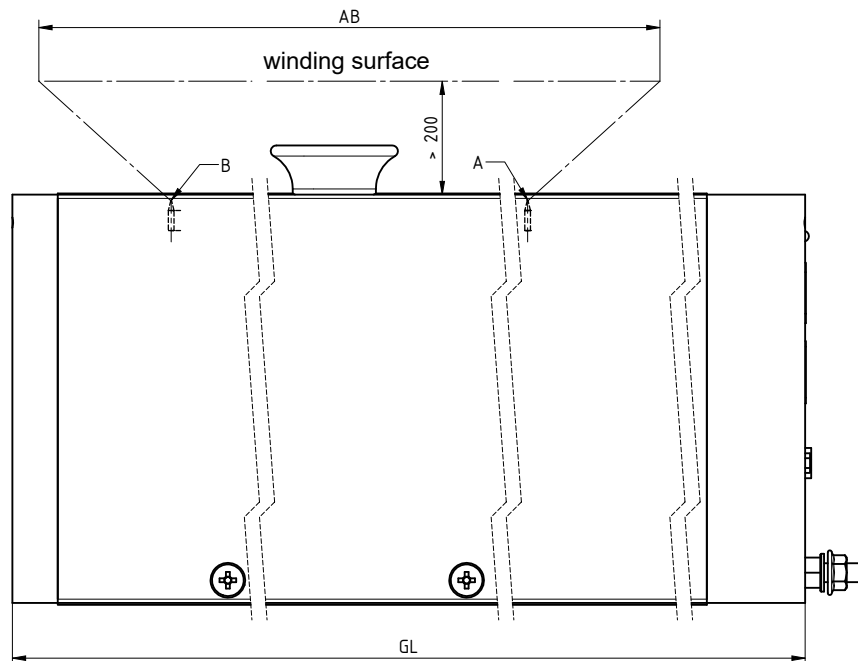


Fig. 8:  
RX3  
discharging bar

AB = working width      A = frist tip  
GL = total length      B = last tip

Z00062y

### Available lengths of the RX3 bar

reference code	total length	max. working width	weight
RX3/S000848	848 mm	920 mm	5.6 kg
RX3/S001088	1088 mm	1160 mm	6.8 kg
RX3/S001328	1328 mm	1400 mm	8.0 kg
RX3/S001568	1568 mm	1640 mm	9.2 kg
RX3/S001808	1808 mm	1880 mm	10.4 kg
RX3/S002048	2048 mm	2120 mm	11.6 kg
RX3/S002288	2288 mm	2360 mm	12.8 kg
RX3/S002528	2528 mm	2600 mm	14.0 kg
RX3/S002768	2768 mm	2840 mm	15.2 kg
RX3/S003008	3008 mm	3080 mm	16.4 kg

## 9. Spare parts and accessories

Article	Article No.
Power supply with mains cable	111114
Slot nut M6	106251
Voltage supply connector	109536
Function and fault signal connector	109537
Cleaning brush with handle	RBR22
Volt Stick	109136
Operating instructions (specify language)	BA-xx-2058

Please specify the article number when ordering.

# EU-Declaration of Conformity

CE-2058-en-2402

Eltex-Elektrostatik-Gesellschaft mbH  
Blauenstraße 67 - 69  
D-79576 Weil am Rhein



declares in its sole responsibility that the product

## Discharging Bar ionSTAR RX3 (according to Eltex reference code)

complies with the following directives and standards.

Relevant EU-Directive:

**2014/35/EU**

Low Voltage Directive

Harmonized standard applied:

EN 60204-1:2018

Safety of machinery – Electrical equipment of machines –  
General requirements

Relevant EU-Directive:

**2014/30/EU**

EMC Directive

Harmonized standards applied:

EN IEC 61000-6-2:2019

Electromagnetic compatibility (EMC)  
Generic standards – Immunity for industrial environments

EN 55011:2016 + A1:2017  
+ A11:2020 + A2: 2021

Industrial scientific and medical equipment –  
Radio-frequency disturbance characteristics – limits and methods  
of measurement

Relevant EU-Directive:

**2011/65/EU**

RoHS Directive

in the version effective at the time of delivery.

Eltex-Elektrostatik-Gesellschaft mbH keep the following documents for inspection:

- proper operating instructions
- plans
- other technical documentation

Weil am Rhein, 13.02.2024  
Place/Date

A blue ink signature of Lukas Hahne, written in a cursive style. Below the signature is a horizontal line, and below that, the text "Lukas Hahne, Managing Director" is printed.

# UKCA Declaration of Conformity

CA-2058-en-2402

Eltex-Elektrostatik-Gesellschaft mbH  
Blauenstraße 67 - 69  
D-79576 Weil am Rhein



declares in its sole responsibility that the product

**Discharging Bar IONSTAR RX3** (according to Eltex reference code)

complies with the following directives and standards.

Applicable Regulation:

**S.I. 2016 No. 1101**

Electrical Equipment (Safety) Regulations

Used Designated Standard:

BS EN 60204-1:2018

Applicable Regulation:

**S.I. 2016 No. 1091**

Electromagnetic Compatibility Regulations

Used Designated Standard:

BS EN IEC 61000-6-2:2019

BS EN 55011:2016+A2:2021

Applicable Regulation:

**S.I. 2012 No. 3032**

RoHS Regulations

in the version effective at the time of delivery.

Eltex-Elektrostatik-Gesellschaft mbH keep the following documents for inspection:

- proper operating instructions
- plans
- other technical documentation

Weil am Rhein, 15.02.2024  
Place/Date

  
Lukas Hahne, Managing Director

# Eltex offices and agencies

The addresses of all  
Eltex agencies can be  
found on our website at  
[www.eltex.de](http://www.eltex.de)



Z01007y



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