Operating Instructions

F01026y

VARIO

slimBAR

Series R47 Discharging Bars
for AC Operation

BA-en-2074-2307

ellex
electrostatic
innovations

List of contents

Dear customer,

The new Series R47 discharging bars are designed for the active discharging of disruptive static charges which develop in production processes. The bars are operated with an alternating voltage of max. 5 kV at 50…250 Hz and are designed for discharging moving surfaces.

Due to differences in the surface charge profiles on different materials, charges with both polarities are provided by the discharging bars. The corona section with its optimized geometrical configuration ensures ultimate discharging efficiency.

The advantages of the R47 discharging bars:

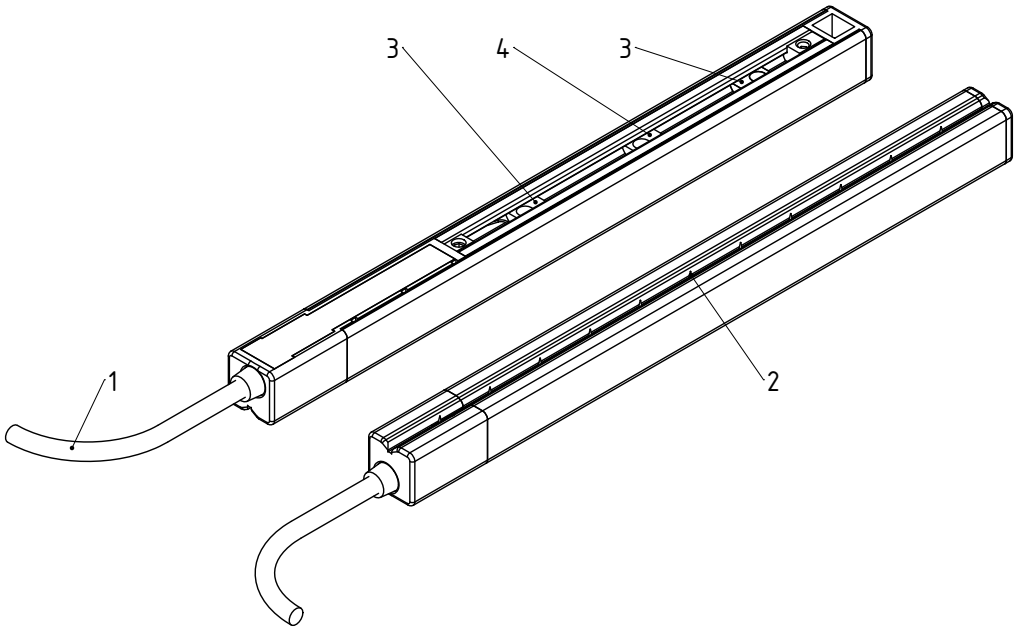
- ultimate discharging range and hence enhanced depth effect
- high active discharging power through isolated ground conductors
- high safety standards through passive discharging power with deactivated power supplies
- safety through function and malfunction monitoring
- easy assembly
- no health hazards in case of electric shocks when making contact with the tips

The optimum discharging effect is guaranteed in conjunction with the Eltex ES47 high voltage power supply.

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



Z-113230y_1

Fig. 1: Overview of the R47 discharging bar

1 High voltage conductor
2 Ionising tips
3 Sliding nuts M5 (2x)
4 Sliding nuts M5 (only for AL > 1000)

2. Safety

The Series R47 discharging bars 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 bars may nevertheless be hazardous to personnel and may cause injury or damage. Read the operating instructions carefully and observe the safety notices.

Warning!
Do not touch the emission tips of the discharging bars when the supply voltage from the power supply is switched on. Always disconnect the supply voltage to the power supply before carrying out any cleaning or maintenance work.

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

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

2.1 Proper use

The Series R47 discharging bars must be used only for discharging static charges from material surfaces. Other uses are not permitted.

The discharging bars must be operated only together with the dedicated Eltex PI, ES6x, ES51 or ES24 power supplies. These power supplies guarantee the optimum adaptation to the required operational data for the different active bar lengths. Safe operation of the bars is ensured only by using the Eltex power supplies.

Modifications or changes to the discharging bars are not permitted.

Use only original Eltex spare parts and equipment.

2.2 Identification of risks and hazards

Possible risks and hazards resulting from the use of the ion blower heads and the ion blower pistol are referred to in these operating instructions with the following symbols:

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

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

2.3 Work and operational safety

Warning!
Carefully observe the following notes and the complete chapter 2 "Safety", page 7!

- Before carrying out repairs, cleaning or maintenance work and before resetting the unit after malfunctions, switch off the power supply and disconnect the mains supply voltage (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).
- Disconnect or connect the high voltage plugs only with the power supply switched off and with the machine at rest. Also, disconnect the supply voltage to the high voltage power supply.
- 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 vol-tage) 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).
- Check the units and the high voltage cables at regular intervals and before startup for any damage. Damaged components must be repaired professionally or replaced before continuing to operate the unit, or the bar or cable must be disabled.
- In applications involving moving bars, the high voltage cable must be attached such that there is no cable movement near the connection zone of the power supply unit (see chapter 3.1 "Assembling the discharging bar", page 11).
- Observe adequate creepage paths!
  The minimum distance between the emission tip brackets and the conductive machine environment must be 20 mm (see chapter 3.1 "Assembling the discharging bar", page 11).
- Connect or disconnect the high voltage cable only with the power supply switched off (see chapter 3.3 "Connecting the high voltage cable to the power supply", page 14).
- Both the lengths of the high voltage cable and of the active bars are limited, observe maximum lengths (see chapter 3.2 "Maximum active bar length and length of the high voltage cable", page 13).

- 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, chapter 6 "Troubleshooting", page 17).
- Do not touch the emission tips - risk of injury.
  Reflex responses to electrical irritation may increase the risk of secondery accidents; the charging bar as such is safe to touch. If contact is made (single touch), the energy transferred is so low that there is no risk of injury.

- Potential risk for wearers of cardiac pacemakers:
  If persons with a cardiac pacemaker approach or contact the bar, a malfunction of the pacemaker cannot be ruled out; affix the appropriate warning sign.
- Mechanical or electrical modifications of the discharging bars are not permitted. Shortening the shielded high voltage cable on the connecting side of the power supply is permitted.
- The operation of the bars can generate ozone. The ozone concentration levels developing near the bars depend on many different factors such as site of installation, bar current and voltage, air circulation, etc., and can therefore not be specified in general terms.
  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.
  The AGW value (maximum admissible concentration) serves to assess the ozone concentration at the workplace. The user must make sure that the appropriate national AGW value is at no times exceeded, e.g. in Germany the ozone concentration occurring during the operation of the system must not exceed the recommended value based on international limits of 0.06 ml/m³ (0.12 mg/m³).

2.4 Contact protection

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

2.5 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 the high-voltage connection and the individual emission tip must not fall below 10.8 MOhm and not exceed 13.2 MOhm.

2.6 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.

3. Installation and assembly

3.1 Assembling the discharging bar

The mounting profile of the Series R47 discharging bars is grooved. The sliding nuts pushed into these grooves allow the bar to be bolted and mounted. Fig. 2 shows the bar with the required installation distances.

Max. screw depth 6.5 mm
Secure screws against loosening (e.g. Loctite 243)

Warning !
In applications involving moving bars, the high voltage cable must be attached such that there is no cable movement near the connection zone of the power supply unit.

Caution!
Observe adequate creepage paths!
The minimum distance between the emission tip brackets and the conductive machine environment must be 20 mm.

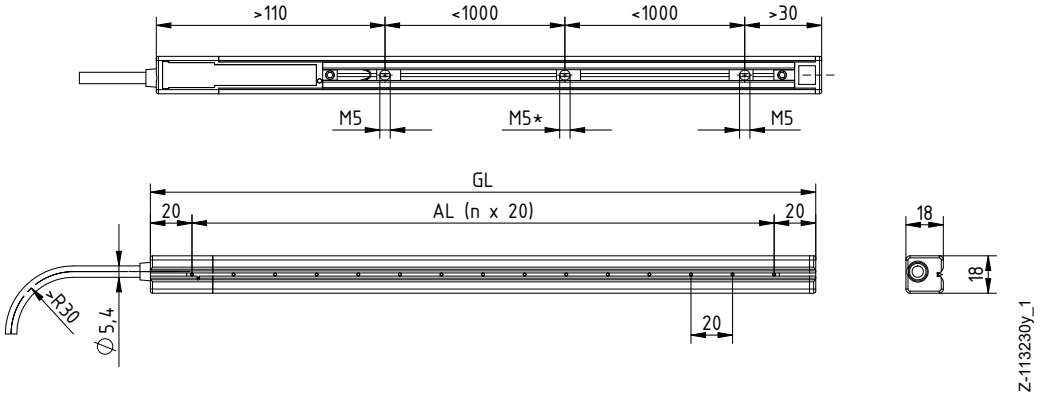


Fig. 2: Assembling the discharging bar

AL = active length 1860 mm max.
GL = total length
**M5 depending on length*

umber of sliding nuts M5: AL of 120 - 1000 mm: 2 pieces
AL of 1020 - 1860 mm: 3 pieces

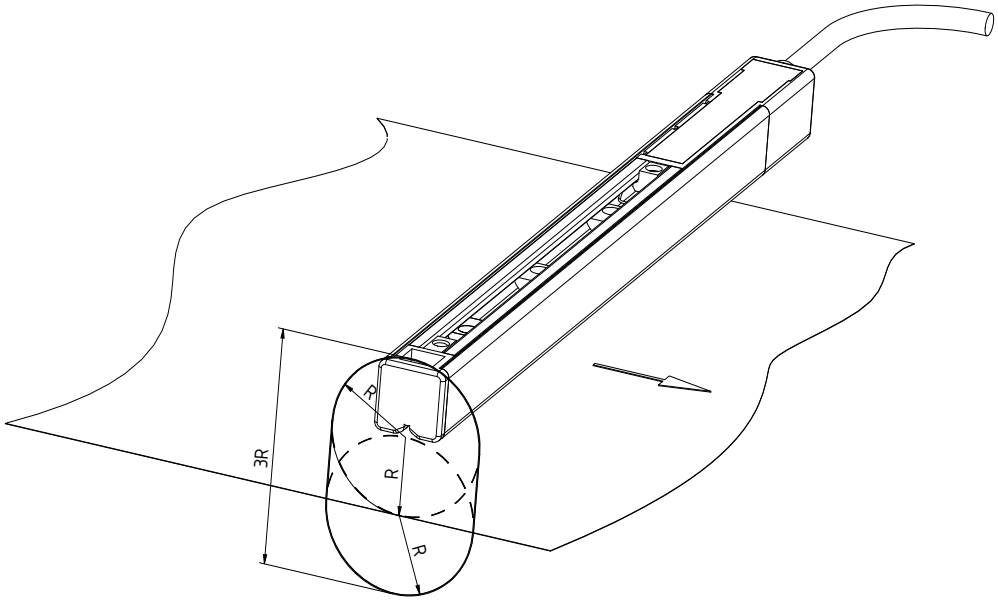
max. allowable distance between the sliding nuts: 1000 mm

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:
A space with the radius R of the bar distance to the web ought to be kept free of any conductive material (Fig. 3). The distance of the emission points to the conductive, earthed printing press area should be greater than to the substrate to be discharged.

Depending on application, the distance between discharging bar and substrate ought to be 30...100 mm.



Z-113415y

Fig. 3:
Zone free of any grounded conductive material with the dimensions R

3.2 Maximum active bar length and length of the high voltage cable

Both the lengths of the high voltage cable and of the active bars are limited. The shielded high voltage cables cause a capacitive load on the transformer inside the power supply. The maximum loading capacity is a result of the function of the total active bar length and the total length of all high voltage cables. Fig. 4 / Fig. 5 demonstrates this principle for PI, ES6x, ES51 and ES24 power supplies.

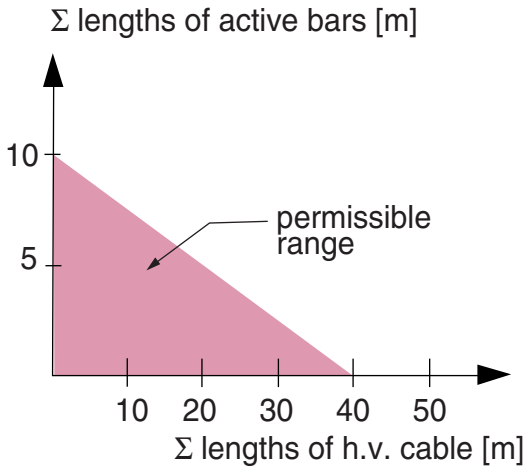


Fig. 4: Loading capacity of the PI, ES6x and ES51 power supplies as factor of active bar length and total length of the high voltage cable

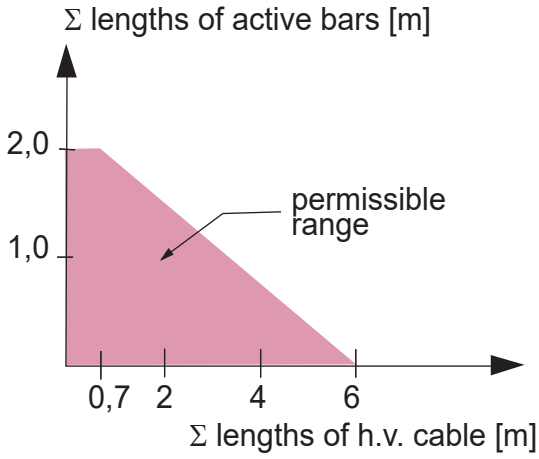


Fig. 5: Loading capacity of the ES24 power supply as factor of active bar length and total length of the high voltage cable

3.3 Connecting the high voltage cable to the power supply

Warning!
Connect or disconnect the high voltage cable only with the power supply switched off.

For the connection to the power supplies, refer to the separate operating instructions for the appropriate power supply.

4. Operation

The discharging bars must be operated only in connection with the Eltex power supplies with max. 5 kV AC output.
These power supplies guarantee the optimum adaptation to the specified operating conditions.

4.1 Startup

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

4.2 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!

- Switch off the power supply unit and disconnect the supply voltage before carrying out any maintenance or repair work.
- 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.

To ensure the trouble-free function of the discharging bars, clean the bars regularly depening on pollution with compressed air free of oil and water (max. 6 x 10^5 Pa and standard compressed air pistol) and a brush with soft plastic bristles (see chapter 9 "Spare parts and accessories", page 20).

Clean grease, ink, glue, paper dust, etc. off the discharging bar 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!
Allow the solvent to evaporate completely before restarting the unit.

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 the high-voltage connection and the individual emission tip must not fall below 10.8 MOhm and not exceed 13.2 MOhm.

6. Troubleshooting

- **Warning!**
  Electric shock hazard!
- Switch off the power supply unit and disconnect the supply voltage before carrying out any maintenance or repair work.
- The machine which has the units fitted must not be in operation.
- Repairs and maintenance work must be carried out by qualified electricians.

Malfunction:
Effectiveness of the application declining.

Cause:
Dirty discharging bars.

Measure:
Clean bar with compressed air and a brush. Clean grease, ink, oil, etc. off the bar with a suitable solvent (cleaning gasoline).

For further malfunctions, refer to the operating instructions for the power supplies.

Caution!
Do not leave the discharging bar to soak in the solvent!

Warning!
Allow the solvent to evaporate completely before restarting the unit.

7. Technical specifications

Bar element	Glass-fibre-reinforced plastic GRP
Carrier profile	Aluminium
Emission tips	Stainless steel
Installation	via sliding nuts M5 in the carrier profile
Operating ambient temperature	0...+70 °C (+32...+158 °F)
Ambient humidity	max. 70 % RH, non-dewing
Dimensions	Profile: 18 x 18 mm, max. active length 1,860 mm see Fig. 6.
Weight	approx. 0.5 kg/m
Operating voltage	max. 5 kV AC
High voltage supply	only via Eltex power supplies
High voltage connection	high voltage cable encapsulated, axial lead-out
Short-circuit current	max 0.5 mA
Contact protection	according to EN 61140
UL Approval	File No. E227156

as shown on appliance marking:

8. Dimensions

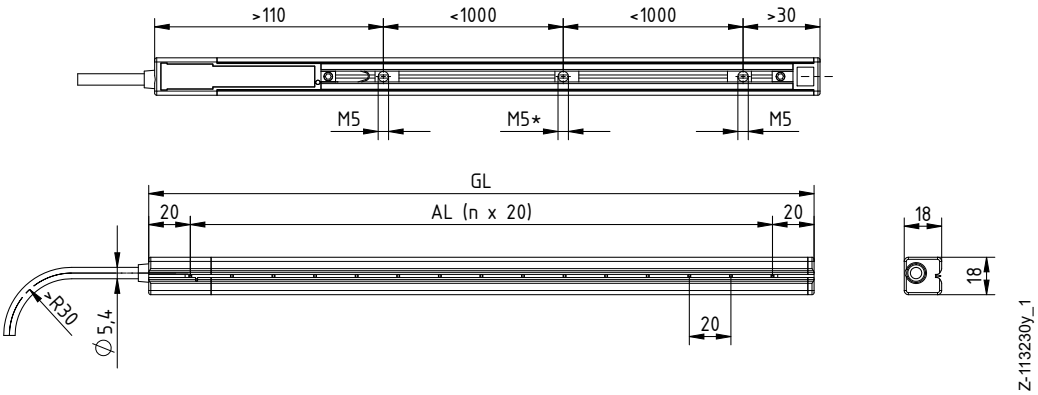


Fig. 6: Dimensions of the R47 discharging bar

AL = active length
GL = total length

**M5 depending on length*

number of sliding nuts M5: AL of 120 - 1000 mm: 2 pieces
AL of 1020 - 1860 mm: 3 pieces

max. allowable distance between the sliding nuts: 1000 mm

9. Spare parts and accessories

Article	Article No.
High voltage distributor discharging , 4 terminals (1 high voltage cable, 4 outputs) specify plug and socket type and cable length	ESV61/_ _
High voltage distributor discharging, 2 terminals (1 high voltage cable, 2 outputs) specify plug and socket type and cable length	ESVY61/_ _
Extension cable	KE/LB
Plug "S" Set for prefabricating the high voltage cable without flexible tube for power supplies PI / ES6x / ES51 and distributor ESV61 / ESVY61/_S	101366
Sliding nut M5	MCH02066
Cleaning brush with handle	RBR22
Volt Stick	109136
Operating Instructions (specify language)	BA-xx-2074

Please specify the article number when ordering.

EU-Declaration of Conformity

CE-2074-en-2011

CE

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

declares in its sole responsibility that the product

Discharge Bar Type R47 (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	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, 16.11.2020
Place/Date

Lukas Hahne, Managing Director

UKCA Declaration of Conformity

CA-2074-en-2208

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

declares in its sole responsibility that the product

Discharging Bar Type R47 (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+A2:2016
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, 30.08.2022
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

Z01007y

Eltex-Elektrostatik-Gesellschaft mbH
Blauenstraße 67-69
79576 Weil am Rhein | Germany
Phone +49 (0) 7621 7905-422
eMail info@eltex.de
Internet www.eltex.de

eltex
electrostatic innovations