Operating Instructions

CHARGING

R23ATR point charging bar

BA-en-3021-2308

ellex
electrostatic
innovations

List of Contents

Dear customer

The R23ATR point charging bar is a robust bar for the point or edge charging of non-conductive surfaces. The charging bar is used wherever static electrical charges may be used beneficially in production processes, e.g. in edge fixation during film production.

The point charging bar is mounted directly behind the flat film of the extruder. The charging bars are used to charge both film edges and to fix the edges to the chill roll. This arrangement prevents neck-in.

The R23ATR/__ point charging bar operates with a maximum high voltage of 30 kV DC, depending on the design the R23ATR11operates with a maximum high voltage of 60 kV DC; it is also suitable for use in higher ambient temperatures.

The advantage of the point charging bar is that it can be operated with either one, two or three exchangeable emission tips. The geometry of the emission tips is freely selectable, offering the best possible adaption to your production processes. The bars can be operated horizontally, vertically and in very confined spaces.

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

Simply 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. Overview and dimensions

1.1 Overview Point charging bar R23ATR/L

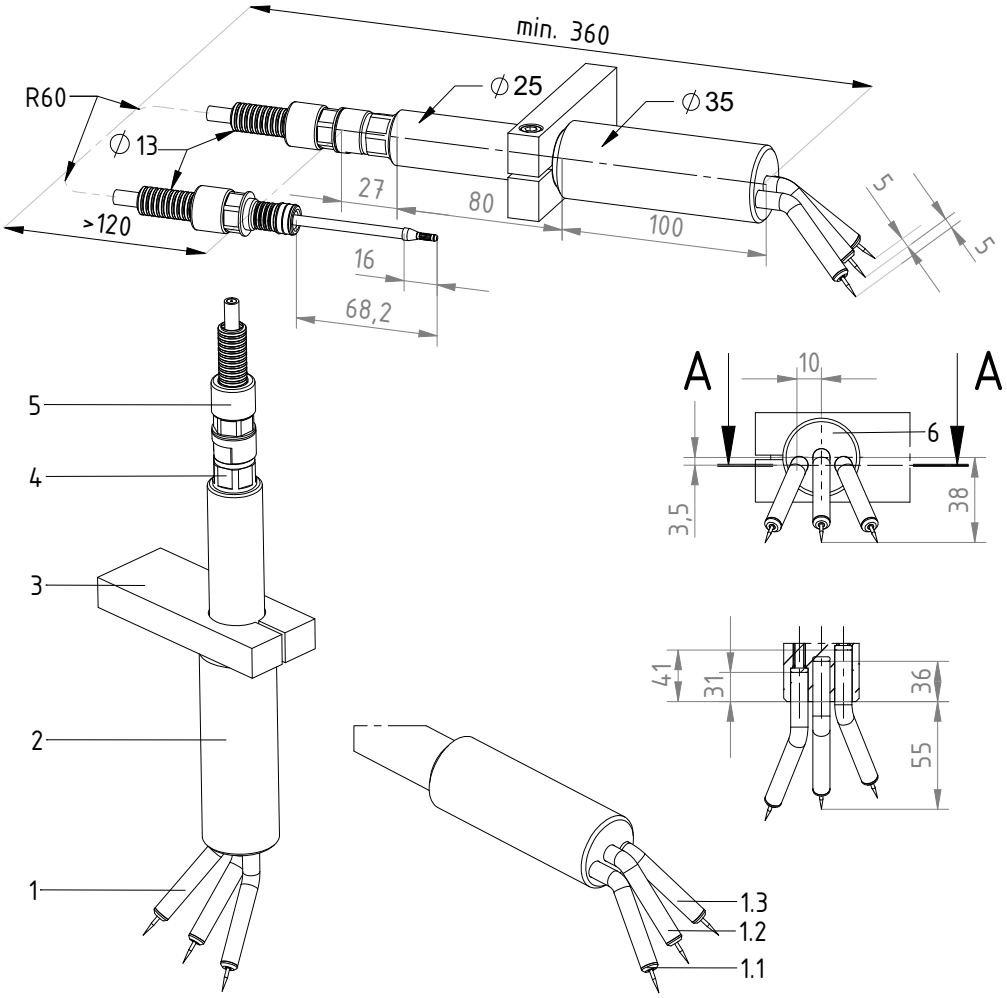


Fig. 1: R23ATR/LAAA point charging bar design left with emission tip Type A

1 Emission tips
2 Base element PU
3 GRP holder for installation (provided by the customer)
4 Cable gland
5 Detachable high voltage cable for connecting to the high voltage generator (accessories: not supplied)
6 Hole diagram and mounting depth of the emission tips

1.2 Overview Point charging bar R23ATR/R

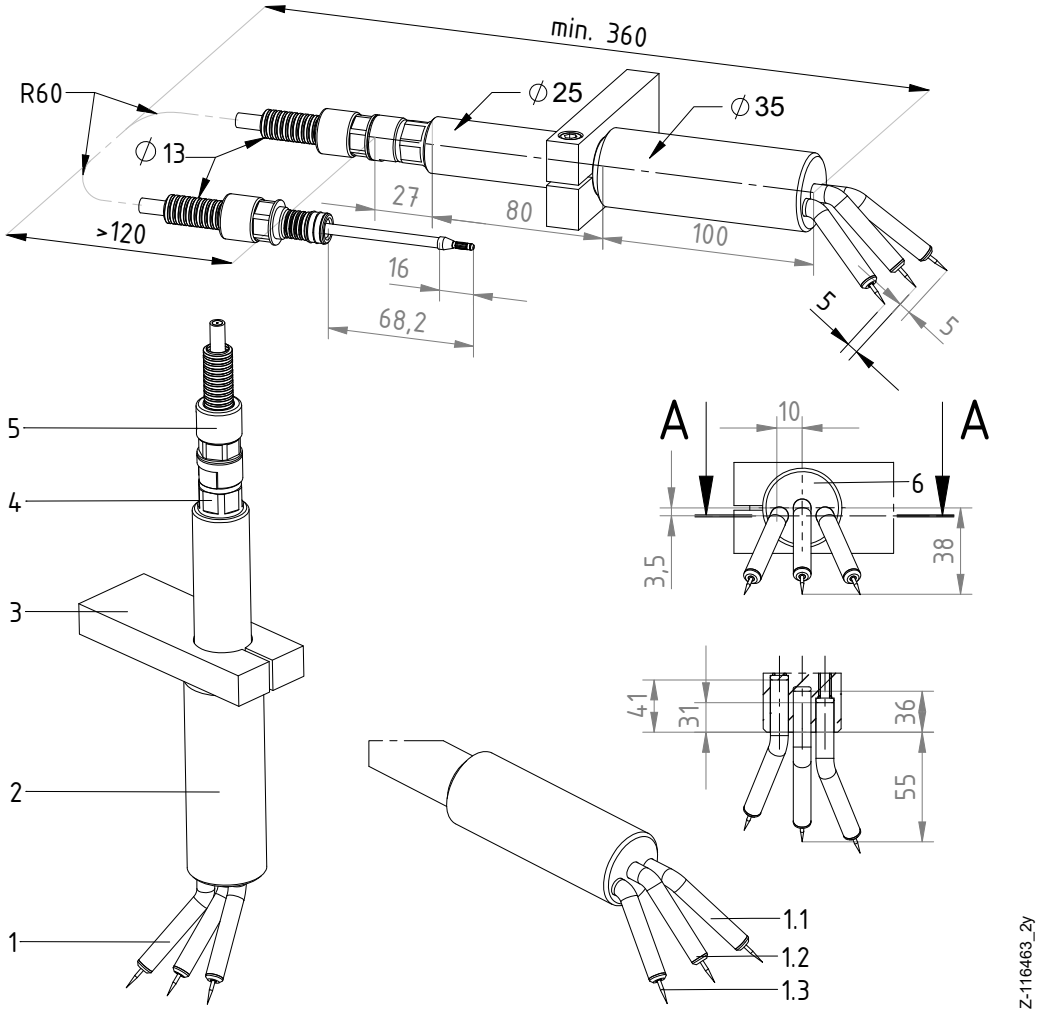


Fig. 2: R23ATR/RAAA point charging bar design right with emission tip Type A

1 Emission tips
2 Base element PU
3 GRP holder for installation (provided by the customer)
4 Cable gland
5 Detachable high voltage cable for connecting to the high voltage generator (accessories: not supplied)
6 Hole diagram and mounting depth of the emission tips

1.3 Overview Point charging bar R23ATR11

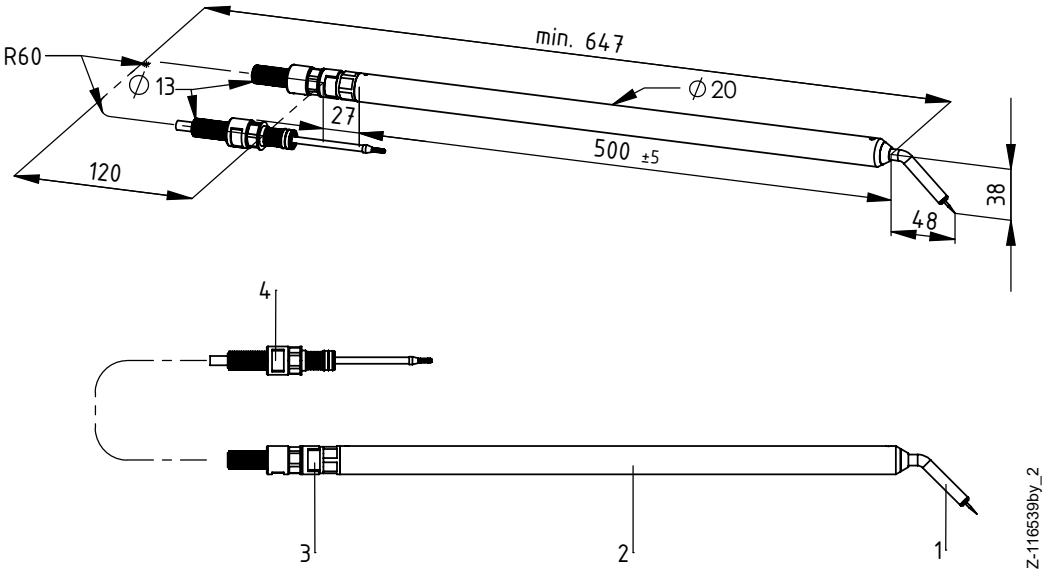


Fig. 3:
Point charging bar with detachable high voltage cable designed: Type R23ATR11/_A with emission tip Type A

1 Emission tip
2 Base element PU
3 Cable gland
4 Detachable high voltage cable for connecting to the high voltage generator (accessories: not supplied)

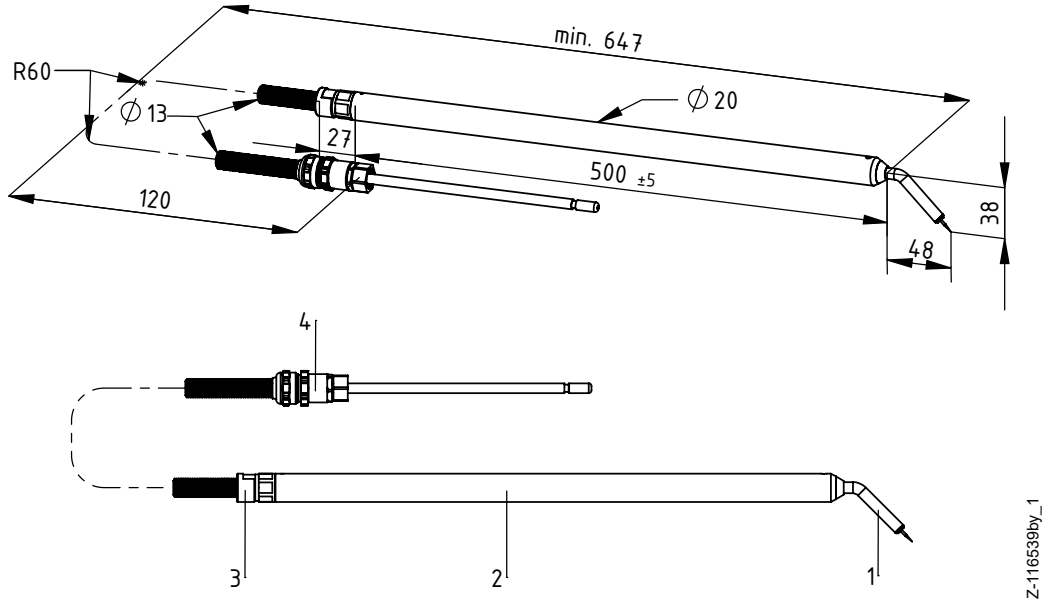


Fig. 4:
Point charging bar with fixed high voltage cable designed: Type R23ATR11/ _AY___ with emission tip Type A

1 Emission tip
2 Base element PU
3 Cable gland
4 Detachable high voltage cable for connecting to the high voltage generator

1.4 Design options of the point charging bars

1.4.1 Point charging bar R23ATR

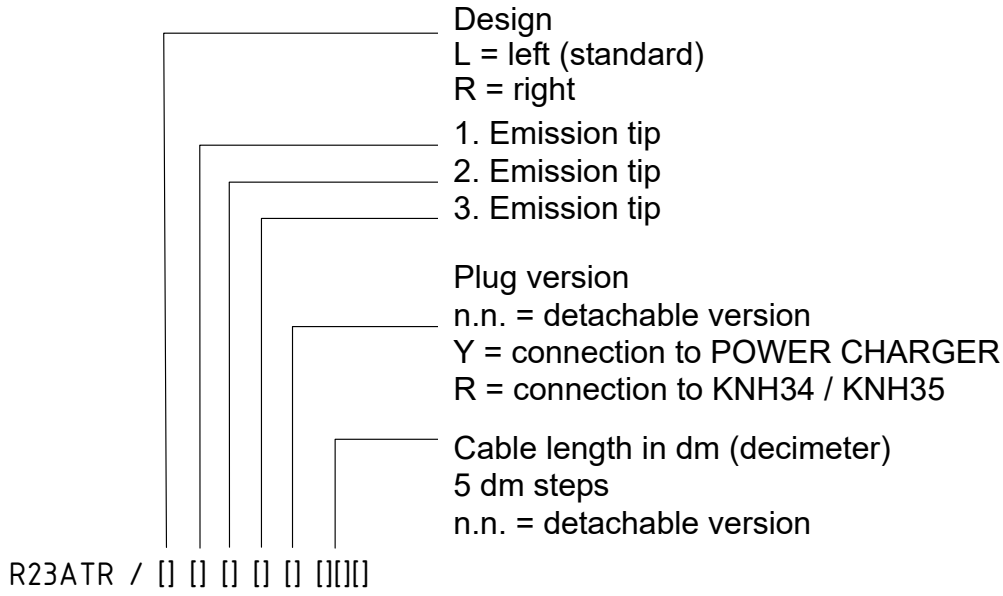
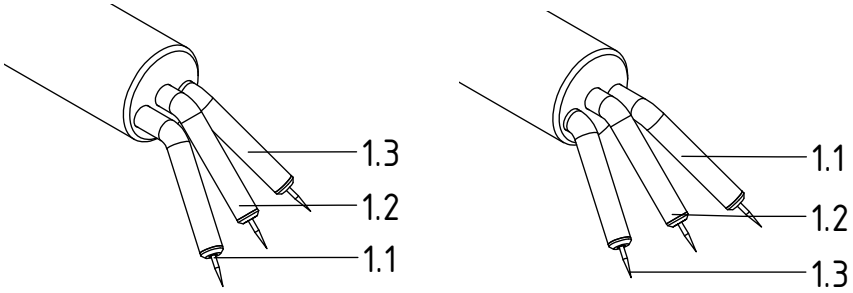


Fig. 5:
R23ATR
point charging bar



design left
R23ATR/LAAA

design right
R23ATR/RAAA

09308X4gy_3+4

Fig. 6:
R23ATR
point charging bar
design
left and right

1.1 1. emission tip
1.2 2. emission tip
1.3 3. emission tip

Overview of the emission tips: please see table chapter 8

1.4.2 Punktaufladeelektrode R23ATR11

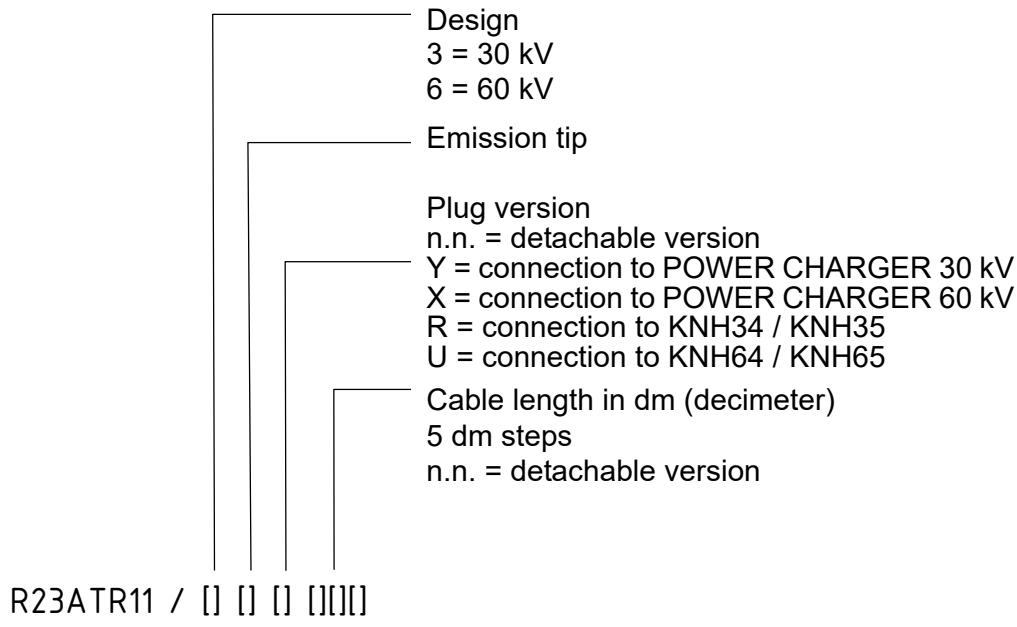


Fig. 7: R23ATR11 point charging bar

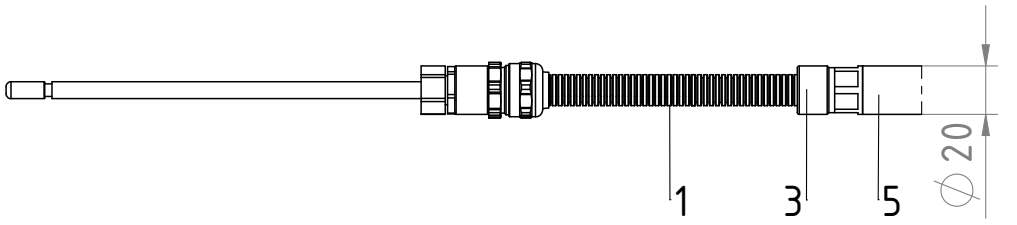


Fig. 8: R23ATR11 point charging bar with fixed high voltage cable, plug version Y, X

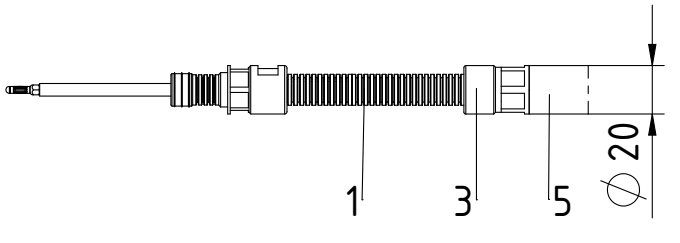
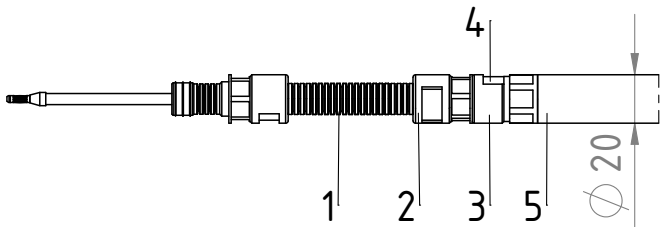


Fig. 9: R23ATR11 point charging bar with fixed high voltage cable, plug version R, U

Fig. 10:
R23ATR11
point charging bar
with detachable
high voltage cable,
plug version R, U



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1 Protecting tube
2 Terminal adapter
3 Cable gland: black at R23ATR and R23ATR11/3
yellow at R23ATR11/6
4 Interlock
5 Bar element

Overview of the emission tips: please see table chapter 8

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.

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 Proper Use

The R23ATR point charging bar must only be used for applying static electrical charges onto paper, fabrics, films and other non-conductive materials for the purpose of improving and accelerating production processes.
The R23ATR point charging bar may only be operated with the Eltex high voltage generators up to maximum 30 kV DC, the R23ATR11 up to maximum 60 kV DC depending on the design.
The Eltex high voltage generator POWER CHARGER PCSC can be used together with versions with fixed high voltage cables.

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.

2.3 Work and operational safety

Warning!
Electric shock hazard!
Carefully observe the following notes and the complete chapter 2 "Safety", page 11!

- Before carrying out repairs, cleaning or maintenance work and before resetting after malfunctions, switch off the power supply and disconnect the mains supply voltage (see chapter 5 "Maintenance", page 21, chapter 6 "Troubleshooting", page 22)
- 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 21, chapter 6 "Troubleshooting", page 22).
- Any work involving the units must be carried out by qualified electricians (see chapter 5 "Maintenance", page 21, chapter 6 "Troubleshooting", page 22).
- 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 21).
- Use only non-conductive material (e.g. GRP) for the installation (see chapter 3.1 "Installation of the point charging bar", page 15).
- If personnel are working near the charging bar, the bar must be screened against inadvertent contact with a mechanical protection device.
  The protective screen must be mounted at a minimum distance of 60 mm from the charging bar and the emission tips.
  The protective screen must be made of GRP or similar suitable insulating material. Protective screens made of conductive material must be grounded (see chapter 3.1 "Installation of the point charging bar", page 15).
- Before adjusting the bar with the operating voltage applied, make sure that the bar is clean and dry and that the cable and the bar are undamaged. Moisture, dirt and defective parts carry the risk of electric shock. When adjusting the bar with the operating voltage applied, the operator must wear conductive footwear (see chapter 3.2 "Distance of the emission tips from the material web", page 16).
- Make sure that the units are clean at all times.
  Dirt results in malfunctions and in premature wear of the units.

- The high voltage cable is connected to the bar via a plug. Work on the male connector must be carried out under offload conditions (see chapter 3.3.2 "Version with detachable cable connection", page 17).
- The high voltage cable must be pushed up to the stop (90 mm for KNH34/KNH35 and 120 mm for KNH64/KNH65) into the cable inlet! The connec-ting area of the high voltage cable must be kept clean (see chapter 3.4 "Connecting the high voltage cable of the charging bar to the high voltage generators KNH34 / KNH64, KNH35 / KNH65", page 18).
- The high voltage cable must be pushed up to the stop (150 mm) into the cable inlet! The connecting area of the high voltage cable must be kept clean (see chapter 3.5 "Connecting the high voltage cable of the charging bar to the high voltage generator POWER CHARGER PCSC", page 19).
- Uncontrolled sparking on the charging bar must be avoided.
  Reduce the high voltage or increase the distance from the substrate (see chapter 5 "Maintenance", page 21).
- 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. No continuous sparking (electric arc) must be visible on the bar tips (see chapter 5 "Maintenance", page 21).
- Check the units and the high voltage cables at regular intervals and before startup for any damage. Any damaged components must be repaired or replaced professionally before continuing to operate the unit, or the units must be disabled.
- 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; the charging bar as such is safe to touch. If contact is made, the energy transferred is so low (≤ 20 tips) that there is no risk of injury.
- Potential dangers for persons with cardiac pacemakers
  The contact of several emission tips with the hand can trigger or suppress a single impulse. Such a single influence is irrelevant. A repeated contact during a short period can be excluded because the electrical irritation causes a warning effect.
- 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).

- Static on personnel
  Static charges on personnel are unlikely if the bars are installed properly. Personnel must wear conductive footwear.
  Please note all national regulations regarding electrostatic charge (e.g. TRGS 727 in Germany).

2.4 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.

2.5 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 234 MOhm and not exceed 286 MOhm.

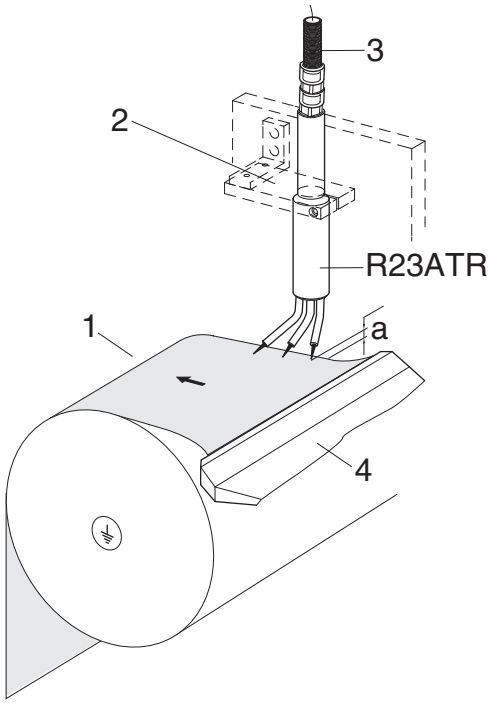
2.6 Technical advance

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 Installation of the point charging bar

Attach the charging bar to the machine via a holder made of non conductive material. The Fig. 11 shows a possible assembly configuration. The charging bar may be installed either horizontally or vertically. Use only non-conductive material (e.g. GRP) for the installation.



1 Film
2 Holder GRP
3 High voltage cable
4 Flat film die

a Distance of the tip from the substrate surface

Fig. 11: Installation

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Warning!
Electric shock hazard!
If personnel are working near the charging bar, the bar must be screened against inadvertent contact with a mechanical protection device.
The protective screen must be mounted at a minimum distance of 60 mm from the charging bar and the emission tips.
The protective screen must be made of GRP or similar suitable insulating material. Protective screens made of conductive material must be grounded.

3.2 Distance of the emission tips from the material web

The optimum distance a to the substrate is 20...40 mm with an operating voltage of 15...25 kV. In edge tacking to prevent neck-in, a distance of 10 mm with a maximum operating voltage of 20 kV is also permitted (see Fig. 11).

Warning!
Before adjusting the bar with the operating voltage applied, make sure that the bar is clean and dry and that the cable and the bar are undamaged. Moisture, dirt and defective parts carry the risk of electric shock. When adjusting the bar with the operating voltage applied, the operator must wear conductive footwear.

3.3 High voltage cable of the charging bar

3.3.1 Version with fixed high voltage cable

Using the type R23ATR and type R23ATR11 point charging bar in connection with the charging generator POWER CHARGER PCSC, only the version with a fixed high voltage cable is permitted.

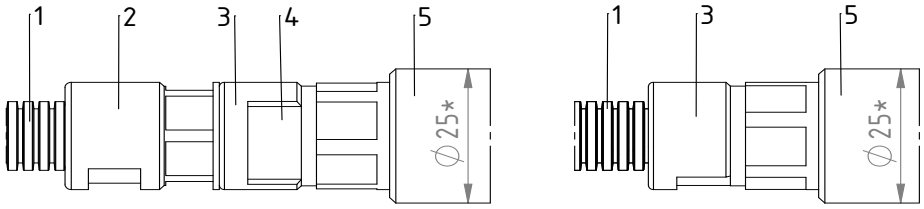
3.3.2 Version with detachable cable connection

The high voltage cable is connected to the bar via a plug. Work on the male connector must be carried out under offload conditions.

Caution!
Use a screwdriver to open the interlock (4) of the cable gland as shown in Fig. 12. Pull the high voltage cable with corrugated tube (1) and terminal adapter (2) out of the bar element (5). Insert the new high voltage cable with corrugated tube and terminal adapter (2) into the bar element **up to the stop** (laminated contact must engage properly). Re-attach the terminal adapter (2) to the interlock (4).

Fig. 12:
R23ATR
male connector of the high voltage cable

** R23ATR11: Ø20*



1 Protecting tube
2 Terminal adapter
3 Cable gland: black at R23ATR and R23ATR11/3
yellow at R23ATR11/6
4 Interlock
5 Bar element

3.4 Connecting the high voltage cable of the charging bar to the high voltage generators KNH34 / KNH64, KNH35 / KNH65

Warning!
Electric shock hazard!
Work may be carried out only if:

- the supply voltage to the generator has been disconnected,
- the machine is at a standstill because the bars pick up charges if the material web is running.

Method:
Connect the bars via the prefabricated high voltage cable. Push the high voltage cables up to the stop into the socket connection. Finally, secure the adapter inside the socket with the clip provided (see figure).

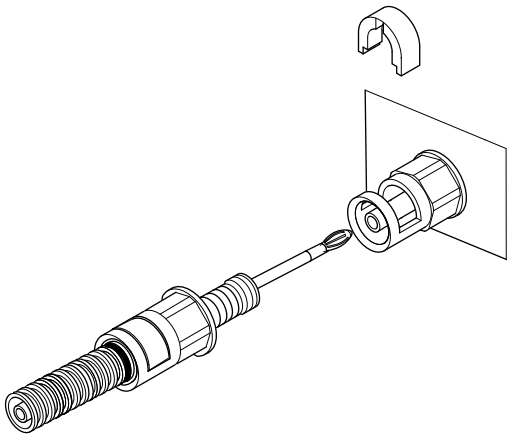


Fig. 13: Connecting the high voltage cable

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Cables without adapters have a color-coded marking on the flexible tubing. This marking must lie flush with the outside edge of the coupling.

Note: The clip must be fully inserted.

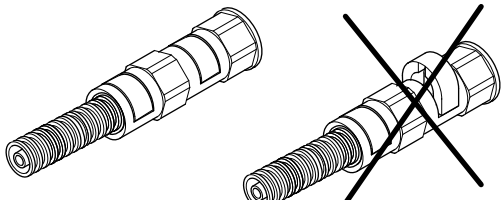

Fig. 14: Inserting the clip

correct incorrect

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Caution!
The high voltage cable must be pushed up to the stop (90 mm for KNH34/ KNH35 and 120 mm for KNH64/KNH65) into the cable inlet! The connecting area of the high voltage cable must be kept clean!

3.5 Connecting the high voltage cable of the charging bar to the high voltage generator POWER CHARGER PCSC

Warning!
Electric shock hazard!
Work may be carried out only if:

- the supply voltage to the generator has been disconnected,
- the machine is at a standstill because the bars pick up charges if the material web is running.

Method:
Connect the bars via the prefabricated high voltage cable. Push the high voltage cables up to the stop into the socket connection. Finally, the crew connection is tightened.

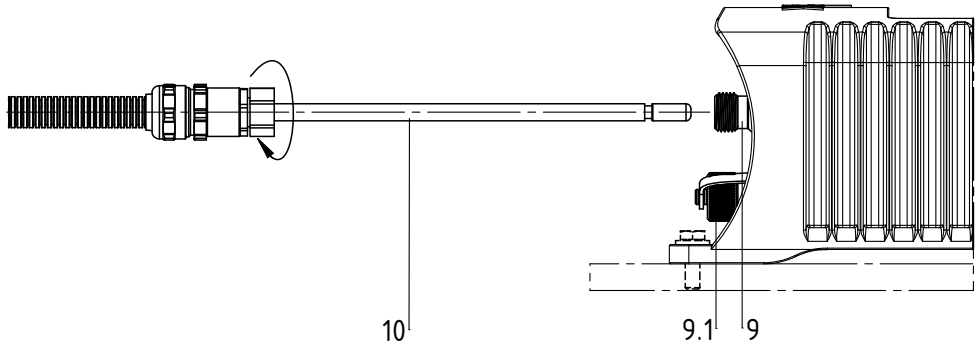

Fig. 15: Connecting the high voltage cable

9 / 9.1 High voltage outputs 10 High voltage cable

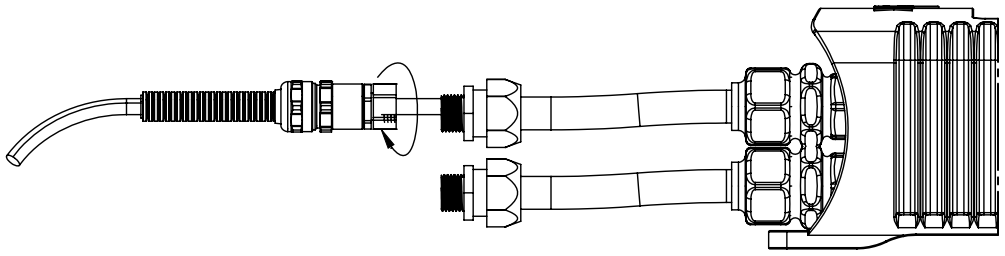

Fig. 16: Connecting the high voltage cable with 60 kV

9.1 High voltage cable connections with 60 kV

Note:
The screw connection must be fastened with a torque of 3 Nm.

Caution!
The high voltage cable must be pushed up to the stop (150 mm) into the cable inlet! The connecting area of the high voltage cable must be kept clean!

3.6 Disconnecting the high voltage cable

Warning!
Electric shock hazard!
Work may be carried out only if:

- the supply voltage to the generator has been disconnected,
- the machine is at a standstill because the bars pick up charges if the material web is running.

Take off the clip at the KNH_ _ generators, using a 3 mm screw driver. Then pull out the cable.

Disconnect the union nut (SW18) at the POWER CHARGER PCSC generators. Then pull out the cable.

4. Operation

4.1 Setting the operating voltage

The operating voltage on the high voltage generator is set at between 15 and 25 kV depending on the distance "a" of the emission tips from the substrate.

The correct operating voltage is set as soon as the desired effect is achieved by using the charging bar.

Caution!
Uncontrolled sparking on the charging bar must be avoided.
Reduce the high voltage or increase the distance from the substrate.

5. Maintenance

Warning!
Electric shock hazard!

- Do not carry out any maintenance or repair work without first switching off the high voltage and disconnecting the supply voltage.
- 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 groundedThe machine which has the charging bars fitted must not be in operation.
- Before carrying out any work involving the units, the machine which has the units fitted must not be in operation.
- Repairs and maintenance work must be carried out only by qualified electricians.

To ensure the proper function of the charging bars, clean the bars regularly depening on pollution with compressed air (max. 6 x 10^5 Pa) free of oil and water and a brush with soft plastic bristles (see chapter 8 "Spare parts and accessories", page 24).

Use a suitable solvent (benzine) to remove dirt or grease. Do not immerse the charging bar or the high voltage cable in solvent

Warning!
Risk of deflagration!
Before restarting the charging bar, make sure that the solvent has evaporated completely.

Caution!
Do not damage the emission tips of the bars.

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 234 MOhm and not exceed 286 MOhm.

6. Troubleshooting

Warning!
Electric shock hazard!

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

Malfunction: decrease in efficiency

Cause	Remedy
Fouled charging bar	Clean the bars using compressed air (6 x 10^5 Pa max.) free of oil and water and a soft brush. Use a suitable solvent to remove dirt or grease (see chap. 5 Maintenance). **Caution!** Do not immerse the charging bar in solvent.
Discharging to earth potential	Remove metallic objects from the vicinity (60 mm) of the charging bar. The fitting and installation material of the charging bar must be non-conductive.
Incorrect distance from substrate	Adjust distance between charging bar and substrate.
Uncontrolled sparking or electric arc forming on the charging bar	Increase distance from substrate or nearest object, or reduce high voltage

7. Technical specifications

Bar element	PU, UL 94-V0
Emission tips	R23ATR: max. 3 emission tips R23ATR11: 1 emission tip exchangeable, adjustable, with insulating coating, current-limited
Ambient operating temperature	0...+120 °C (+32...+248 °F) in emission tip area 0...+70 °C (+32...+158 °F on bar element
Dimensions	see Fig. 1 - Fig. 3
Operating voltage	R23ATR: 30 kV DC max. R23ATR11: 30 kV DC resp. 60 kV DC max.
High voltage power supply	via high voltage generators series KNH34/35, KNH64/65 resp. POWER CHARGER PCSC
High voltage cable	detachable cable connection: prefabricated, exchangeable high voltage cable in plastic tubing with connector for charging bar and high voltage generator, high voltage cable must be ordered separately, specify cable length and type of generator when ordering Fixed high voltage cable: high voltage cable in plastic tubing with connector for high voltage generator, specify cable length and type of generator when ordering

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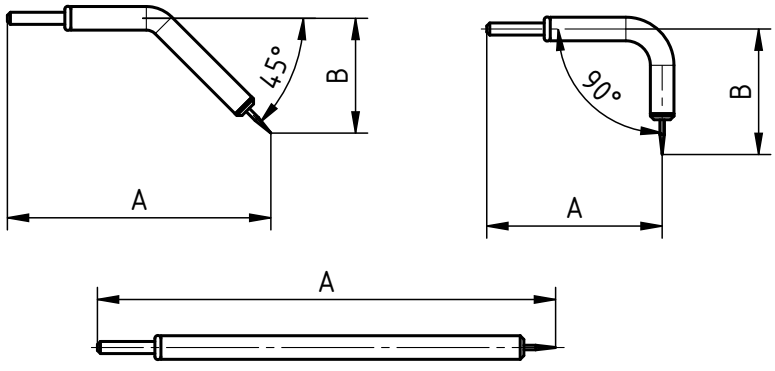

Fig. 17: Overview R23ATR and R23ATR11 emission tips

Consider mounting depths according to Fig. 1 - Fig. 3

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8. Spare parts and accessories

Article	Article no.
R23ATR and R23ATR11/3 high voltage cable in plastic tubing from the generator KNH34, KNH35 and distributor KNHV3 to the charging bar (specify cable length)	KA/RR___
R23ATR11/6 high voltage cable in plastic tubing from the generator KNH64, KNH65 and distributor KNHV6 to the charging bar (specify cable length)	KA/UU___
R23ATR and R23ATR11 high voltage cable in plastic tubing from the generator POWER CHARGER PCSC and distributor PCV/_ _ to the charging bar (specify cable length)	KA/YY___
Plug R Set for fabricating the high voltage cable with flexible tube for 30 kV charging bars, for connection to the generators KNH_ _	104165
Plug U Set for fabricating the high voltage cable with flexible tube for 60 kV charging bars, for connection to the generators KNH_ _	109501
Plug Y Set for fabricating the high voltage cable with flexible tube for 30 kV charging bars for connection of the generator POWER CHARGER PCSC (external diameter of the cable min. 6.55 mm) resp. modification set for charging plug Y	117985
Plug X Kit for cutting the high voltage cable to size with flexible tube for 60 kV charging bars for connection of the generator POWER CHARGER PCSC_ (external diameter of the cable min. 6.55 mm) resp. modification set for charging plug X	117986
Cleaning brush with handle	RBR22
Operating Instructions (specify language)	BA-xx-3021

Please specify the article number when ordering.

Article				Article no.
Emission tips (see Fig. 17)				
Type	**Angle**	**A (mm)**	**B (mm)**	**Art.-No.**
A	45°	87	38	100294
B	0°	151.5	0	100293
C	45°	77	38	100292
D	45°	97	38	100291
E	45°	129	80	103418
F	45°	187	38	100301
G	45°	241	38	100296
H	45°	251	38	100295
I	45°	356	38	103500
J	90°	48	41.5	100297
K	90°	58	41.5	106320
L	90°	58	60.5	107854
M	90°	64	41.5	106615
N	90°	68	41.5	106321
P	90°	74	41.5	106616
R	90°	84	41.5	106617
S	90°	195	138.5	100298
T	90°	205	43	104038
U	90°	205	138.5	100299
V	90°	215	138.5	100300
X				no tip

EU-Declaration of Conformity

CE-3021-en-2011

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

declares in its sole responsibility that the product

Charging Bar Type R23ATR (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-3021-en-2208

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

declares in its sole responsibility that the product

Charging Bar Type R23ATR (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

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