



Електролуks Electrolux

Industrija za elektricni greaci, gumeni proizvodi i servis

**ELECTROLUX HEATING-MEASUREMENT-CONTROL
MACEDONIA**

Every kind of problem can be solved by our advisory and planning team in the most efficient way possible. Thanks to our own manufacturing facilities, we are able to deal with even the most complex customer requirements and produce heating elements in one-off or series production.



ELECTROLUX.MACEDONIA



Best in MACEDONIA

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Ovo je slika i sopstvenost na Electrolux-Bitola. Bez njegovo pismeno odobruvanje istiot nesmee da se prepisuje, umnozava niti kopira bez soglasnost od Electroluks vo sproitvno se snosaf posledici vo smislana clenovite 163 i 164 od Kivicnotaf zakon R.M. (povreka na avtastko pravo)



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**ELECTROLUX HEATING-MEASUREMENT-CONTROL
MACEDONIA**

Electrolux point-heating systems are essential for traffic operation under hard winter conditions!



**We provide heating for:
points for vignole rails, points for channel rails,
switch-blade locks, crossings with movable frogs,
barrier drives etc.**



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ELECTROLUX MACEDONIA

Together with us you can set the points in the right direction

Ice and snow are the worst enemies in the fight to keep railways running in winter. Today, it is absolutely necessary to guarantee a functioning rail network at all times. In winter, the neuralgic points in a railway network are its points. Their perfect functioning, in spite of ice and snow, is of utmost importance to a modern transportation company. In the beginnings of railway history, personnel familiar with a particular location could keep the points clear in winter. High costs and lack of personnel forced the railways - in co-operation with

industry - to develop equipment that allows points to be kept ready for operation at all times. Train fre-

quently in recent years which, for operational reasons, makes substantial cleaning of the points impossible. The development of electrical point heaters became an operational necessity. These heaters can, depending on the particular point configuration, be operated either on-site or from the nearest control centre by means of corresponding remote controls.

Electrolux point heating

Even in the case of heavy snowfall and even at extremely low temperatures the points remain free from snow and ice - thanks to internationally-known Electrolux point heating systems.

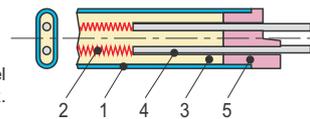
Their low power consumption, robust and corrosion-free construction as well as their easy and fast mounting without having to interrupt services guarantee snow and ice-free operation. With the proven Electrolux point heating systems

winter weather poses no problems. For many years now, we have been providing point heating systems for all types of standard vignole rails and channel rails for tramways. Almost all European state and private railways can be found among our customers. Experience gained over a long period of time and close co-operation with various railway companies have let Electrolux point heating systems develop into



The heating element

High-quality Electrolux heating elements with their continuous, homogeneous, seamless and ultra-pure magnesium oxide insulation, their sheath made of 18 / 8 chrome-nickel steel and a cross-section of approx. 5.3 x 13.2 mm have been used as heating elements for more than 70 years. A metal sheath encloses the heating elements that are embedded in MgO and provides the heating element with a high level of mechanical stability.



- 1 Sheath
- 2 Heating element
- 3 Insulation (magnesium oxide), highly compacted, seamless
- 4 Connection pins
- 5 End insulation

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The connection element



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The connector is made of chrome-nickel steel and is completely water-proof, so that external influences such as moisture or dirt can not penetrate. The inside of the casing has a plastic coating. The wide grip-surfaces on the screw cap and just two seals are further advantages of Electrolux point heaters.

The waterproof connection element is partially or fully encapsulated using artificial resin. In the case of the partially encapsulated connection element, the incoming lead is connected to the heating element by means of 6.3mm blade terminals. As a result, the replacement of a defective cable is possible at any time



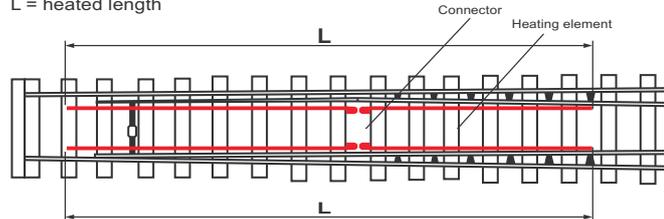
Layout of Electrolux point heaters

The heating element lengths are dependent on the particular point model. The stock rail is heated from about 25 cm before the end of the tip of switch. For a heating capacity of 330 watts per meter, layouts such as that shown on the right, for example, can be used.

Rod-shaped Electrolux heating elements are used for the point's switch blades, at the foot of the stock rails and in the space between rail and switch blade. In this way, the heating element is protected against damage by stone impact and during maintenance.

Layout of the heating elements for a simple point

L = heated length



Most common points can be equipped using just three standard types of heaters:

L = 2870 m - 230 [V] / 900 [W]

L = 3720 m - 230 [V] / 1200 [W]

L = 4700 m - 230 [V] / 1500 [W]

Other lengths, power-ratings and voltages can be provided

We will be pleased to offer you point heaters manufactured to your particular specifications.

Further advantages of Electrolux point heaters:

- Excellent heat transfer to the rail
- Low space requirements
- Use of standard components
- Standard mounting components for all rail cross - sections

- Just three different types of heating elements, since left and right hand versions are not needed
- Minimum stock-keeping
- Fast installation and removal during maintenance work
- Low cost of purchase

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Selection of the most common point sizes, simple equipment

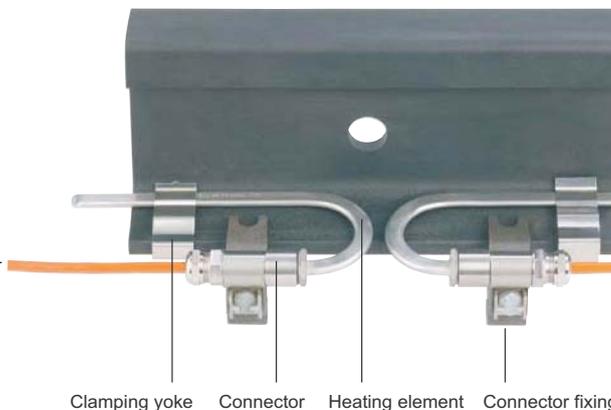
Point size R = metres	Overall heated length per switch blade L = metres	Number of heating elements per switch blade Watt	Nominal power- consumption per switch blade Watt	nominal power- consumption per point Watt
EW 49-190	5.74	2 x 2.87 m	1800	3600
EW 49-300	7.44	2 x 3.72 m	2400	4800
EW 49-500	9.40	2 x 4.70 m	3000	6000
EW 49-760	11.48	2 x 2.87 m	3600	7200
EW 49-1200	14.03	4 (1 x 2.87 m/3 x 3.72 m)	4500	9000
EW 60-300	9.40	2 x 4.70 m	3000	6000
EW 60-500	11.48	4 x 2.87 m	3600	7200
EW 60-760	15.14	4 (2 x 2.87 m/2 x 4.70 m)	4800	9600
EW 60-1200	18.80	4 x 4.70 m	6000	12000
EW 60-2500	26.24	6 (2 x 3.72 m/4 x 4.70 m)	8400	16800

Number, lengths and nominal power-consumption of the heating elements for simple points are shown in tables 1 and 2. For simple cross-over points, twice the number of heating elements are necessary, for double cross-over points four times the number are needed.

Selection of the most common point sizes, alternative equipment

Point size R = metres	Overall heated length per switch blade L = metres	Number of heating elements per switch blade Watt	Nominal power- consumption per switch blade Watt	nominal power- consumption per point Watt
EW 49-190	8.42	2 (1 x 3.72 m/1 x 4.70 m)	2700	5400
EW 49-300	10.31	3 (1 x 2.87 m/2 x 3.72 m)	3300	6600
EW 49-500	12.14	3 (2 x 3.72 m/1 x 4.70 m)	3900	7800
EW 49-760	14.10	3 x 4.70 m	4500	9000
EW 49-1200	16.00	4 (1 x 2.87 m/1 x 3.72 m/2 x 4.70 m)	5100	10200
EW 60-300	10.30	3 (1 x 2.87 m/1 x 3.72 m)	3300	6600
EW 60-500	13.12	3 (1 x 3.72 m/3 x 4.70 m)	4200	8400
EW 60-760	17.82	4 (1 x 3.72 m/3 x 4.70 m)	5700	11400
EW 60-1200	21.54	5 (2 x 3.72 m/3 x 4.70 m)	6900	13800
EW 60-2500	26.37	6 (1 x 2.87 m/5)		

Fitting the heating elements



Electrolux point-heating elements are attached to the rail foot using special clamping yokes made of corrosion-resistant chrome-nickel steel. The clamping pressure is chosen so that optimal heat transfer is guaranteed. Inevitable lateral expansion during heating can occur without affecting operation.

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Connector fixing



The newly developed, 100 000-times proven heating-element connector-mounting provides the perfect method of fixing the connector and the heating element to the rail. Rails with foot widths of 125 mm (SBB I. + S49 + S54) as well as

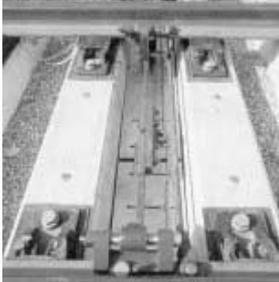
150 mm (UIC 60). can be equipped using the same parts.

Migration of the heating elements caused by vibrations is no longer possible when this method of fixing is used.

Other foot - widths on request.



Heating for switch blade and frog locks



In order to keep switch blade and frog lock compartments free of snow and ice, a lock compartment heating unit according to Zch 4E / h 00.09.05 has been developed in co-operation with the Federal Central Office the «DB» in Munich. Other versions are available on request.



Construction / arrangement wo 1100 mm-long, 230 V / 450 W

Heating elements, are mounted onto two separate carrier plates made of galvanised steel. These are placed onto the ballast bed in the space between the sleepers under the locking bar and the locking pieces. The dead weight of the plates is sufficient so that no additional fixing to the wood or concrete sleepers is necessary. The carrier plates are

quently, the heating elements can be precisely adjusted to meet local factors and the heat can be brought exactly to the right place.

In addition, the slots also provide sufficient drainage so that melted snow and rainwater can immediately run off into the ballast bed.

The two carrier plates are connected together with two connecting pieces.

Electrolux electrical point-heating for tramways (channel rails)



In addition to the well-proven and effective Electrolux point-heating systems for railways, (vignole rails), we have also developed point-heaters for tram networks (channel rails). Several municipal tram networks in European cities have been furnished with our proven point-heating systems.



The heating element

Well-proven Electrolux tubular heating elements with sheaths made of highly corrosion - resistant "Monel" and a circular cross - section of $\Phi = 8.2\text{mm}$ or a flat - oval cross - section of approx. $13.2 \times 5.3\text{ mm}$

are used as heating elements. A completely waterproof connector permits the flexible connection of the feed cable to the heating element.

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vo sporotino se snosot posedioici vo smislana ctenovite 63 i 64 od kivilnot zakon R.M. (povreda na avtorisko pravo)

We produce both individual parts and series products on the most modern production equipment.

Solution-oriented, fast and reliable.

Before our products leave our works, they are subjected to stringent functional and quality checks.

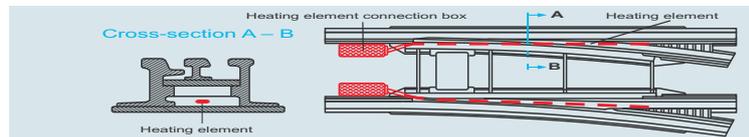


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Installation of chamber heating elements

In the case of chamber heating, the rod-shaped Electrolux tubular heating element is inserted from the switch blade end of the point into the cavity to be found under the tongue guide-plate. Consequently, the element is located exactly below

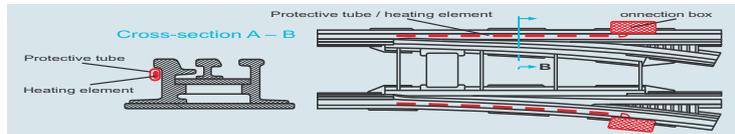
the moveable part of the point and keeps the space necessary for throwing the point free of snow and ice. Due to its small cross-section the heating element is flexible and can be easily introduced.



Installation of stock-rail heating elements

In the case of stock-rail heating, the rod-shaped Electrolux tubular heating element is inserted from

the tongue root end into a protective tube that is welded onto the stock rail.



Rail temperature sensor

For example: NTC temperature sensor Ø 10 mm, with stainless-steel mounting. Specially developed for demanding use in the tramways area. We will be pleased to make you an offer that meets your particular rail temperature sensor needs.



Our range of Products

Call us and describe your problem to us. We will be very pleased to give you competent advice. Ask also for our documentation on the products shown opposite.

Flat and round electrical heating elements	Electrolux heating elements
Screw-in heating elements	Air heaters
High-performance heating cartridges	Thermocouples
Industrial heating elements on the basis of Mikanit and ceramics	Resistance sensors
Ribbed-tube electrical heating elements	Temperature transducers
Spiral tube heating cartridges	Temperature control elements
Control cabinet heating units	Heating cables
Heating vessels	Heating ribbons
SIL heating elements	Heating hoses
	Electrical point heating
	Barrel heaters

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