Instructions for assembly, operation and maintenance of outdoor single-pole disconnectors FIr

rated voltage 25 and 38.5 kV
rated current 400 A

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Outdoor single-pole disconnectors FIr

These switching devices are used for the disconnection of end-position substations and parts of the no-load power lines. The FIr disconnectors are equipped with a simple arc quenching equipment, which provides for breaking of the circuit irrespective of the speed of manipulation.

The disconnectors are designed for mounting on a console or within the range of the line span.

The disconnectors comply with the requirements of the EN 62271-1 and EN 62271-102 standards. The insulators used at the disconnectors meet the requirements on pollution class IV to ČSN 33 0405.

The easy and rugged design of the disconnectors provides for the reliability of their operation in the most different climatic environments.

Parts of the supporting structure are made of hot-galvanized steel; the contact springs, small parts of the locking mechanism and arc-quenching contacts are made of stainless steel.

All current-carrying parts are manufactured of galvanically silvered electrolytical copper.

The dimensioning of the conductors of which the current-carrying path consists, as well as the contact pressure of stainless steel springs are one of the prerequisites for a defect-free switching, even after many years of operation of the disconnector in the most severe operating conditions and also in ice-accretion conditions.

The self-cleaning surface of the brand suspension insulators used, with silicon insulation, guarantees, with a high margin, the long-time insulation properties of the disconnector over the isolating distance, at areas with a high level of air pollution and under rain conditions. The short-circuit withstand capabilities are met with a big margin.

The well-proven structural elements are the result of long-term experience, which, along with the quality of material used and the accuracy of production, guarantee low operation and maintenance costs of the switching device.

The control of the disconnectors is done using 5 to 6 m long switching rods, or using rods being the part of the Powerman Hot handling set with a special attachment that have been tested also for operation in rainy conditions.

Under normal operating conditions the disconnectors do not necessitate any maintenance and, therefore, are maintenance free over a period of twenty years.

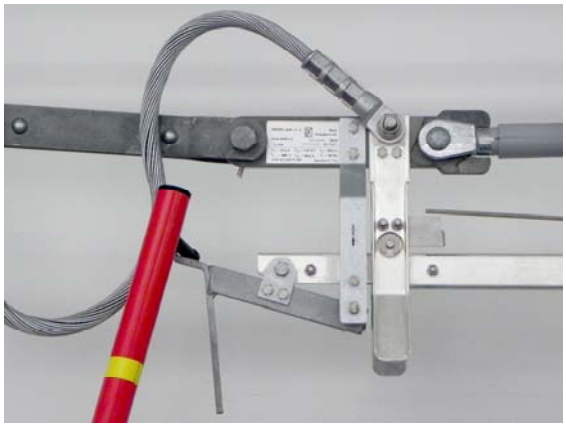
Technical data

Rated voltage	**U**	**kV**	**25**	**38,5**
rated current	I_r	A	400	400
rated short-time current	I_k	kA	16	16
rated dynamic current	I_p	kA	40	40
permitted tension during the operation		kN	30	30
smallest phase pitch when placing the disconnectors side by side		mm	800	1200
smallest phase pitch in off-tracking position of the middle phase		mm	500	700
rated short-time withstand power frequency voltage / 1min. to be applied in both dry and wet conditions across the isolating distance		kV	60	90
rated lightning pulse withstand voltage across the isolating distance		kV	145	210

Function description

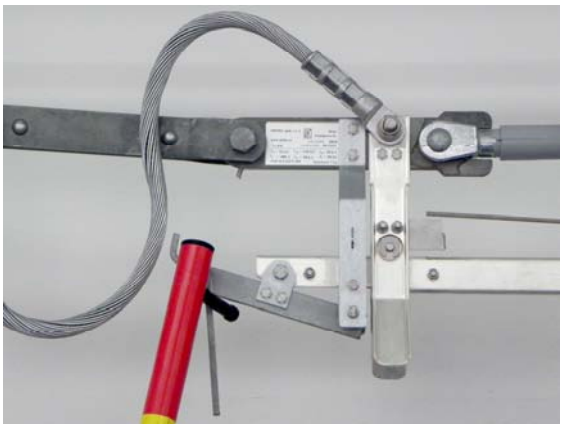
Opening

By pulling the on the control rod suspended over the upper edge of the control lever **6** the locking mechanism **5** opens, which releases the switching knife contact **1**. After loosening the switching knife contact, the current flows through by the arc quenching circuit **15**, connected in parallel. After having reached a distance, which is adequate for safe opening the disconnector opens in a quick-acting way, independent of the operation speed of the disconnector. By further application of pulling forces this contact achieves its opened switching position (vertical position).



Closing

Applying pressure of the operation rod on the bottom edge of the control lever **6** introduces the switching knife contact **1** into the guiding fork **4** and farther to the slide contact **3**. When reaching the end position the locking mechanism **5** locks the switching knife contact **1** in ON position. The quick-opening mechanism is activated during the closing operation.



Assembly

The disconnectors are mounted either straight on to the console or to the interspace of the line span, depending on the type of use. The disconnectors are delivered as an assembly unit, without tension insulators and anchor clamps. The latter are a part of the power line. The mounting takes place in the same way as with the installation of any other elements into the power line (the permitted tensile forces are the result of the cables (conductors) and the tension insulators used). The permitted tensile forces acting on the disconnector can be taken from tabular values. In order to ensure proper stability of the switching device it is necessary to adhere to the prescribed position of the anchor clamps and incoming conductors (which have to face downwards).

When mounting the suspension disconnectors in the interspace of the line span (DRIBO Flrm-v type) it is necessary to shape the incoming conductors in a way to prevent their interference into the operating range of the disconnector control lever.

Following the assembly the proper functioning of the disconnector is to be verified by several ON and OFF switching operations. The functioning of the locking mechanism is verified by applying pulling force on the disconnector´s knife contact.

Maintenance

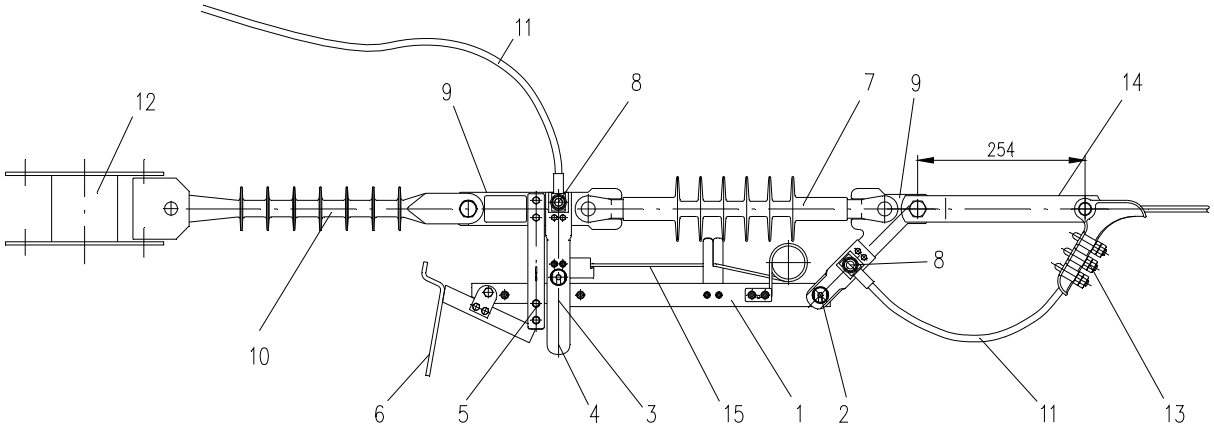
Under normal operating conditions the maintenance works should be performed on the disconnector after approx. 20 years of operation.

In such a case the following maintenance steps are carried out:

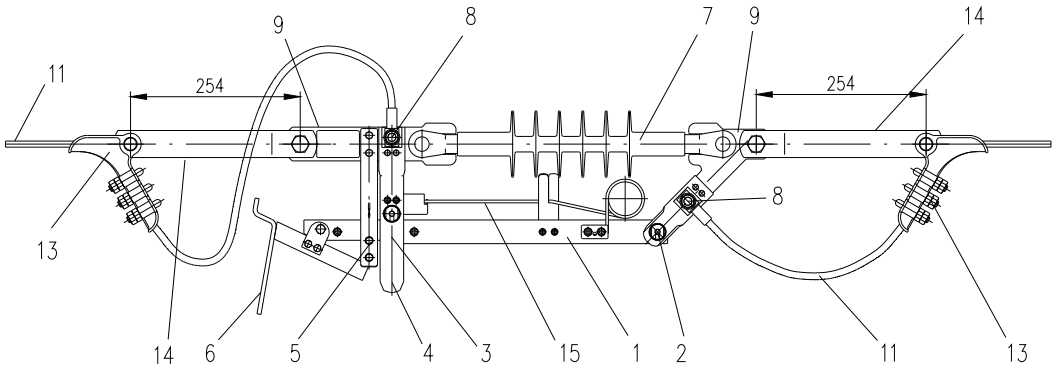
- cleaning the contacts with dissolving and degreasing agent (petrol),
- cleaning the insulator,
- greasing the contacts with the Barrierta L55/1 lubricant grease,
- checking the insulator for damage,
- checking the proper operation of switching function of the disconnector by carrying out several ON and OFF switching operations, incl. the verification of operation of the locking mechanism.

Assembly examples

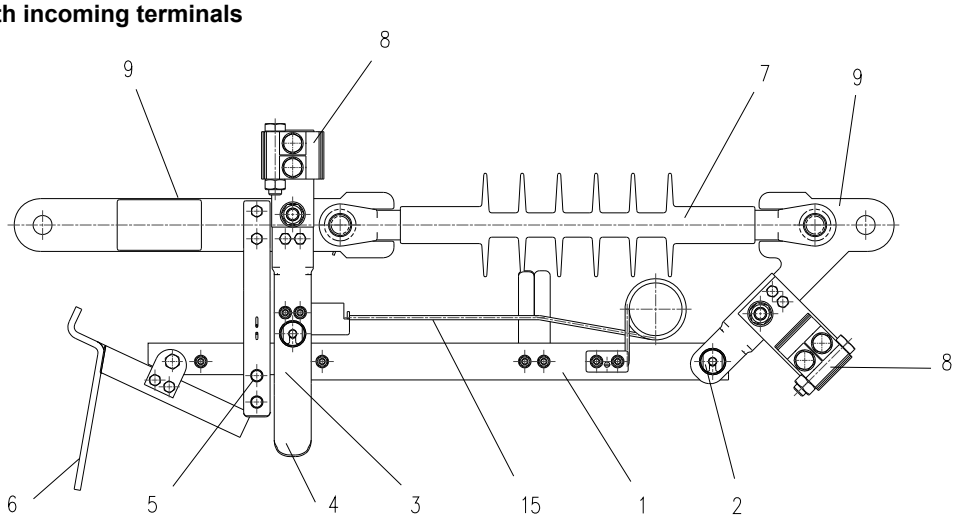
Disconnector mounted on the anchoring insulator



Disconnector suspended on conductors



Version with incoming terminals



1	switching knife contact	6	control lever	11	incoming conductor [1]
2	rotating contact	7	insulator	12	anchoring fixture [1]
3	sliding contact	8	incoming terminal	13	anchoring clamp terminal [1]
4	guiding fork	9	fixture	14	extension piece – fork with lug [2]
5	locking mechanism	10	anchoring insulator [1]	15	quick-opening mechanism

[1] not part of the delivery
[2] separate item – accessory