

# Instructions for assembly, operation and maintenance of outdoor single-pole disconnectors DRIBO Firm

rated voltage 25 and 38.5 kV  
rated current 400 and 1200 A



**DRIBO, spol. s r.o.**

Pražákova 36  
619 00 Brno  
Czech Republic

Tel.: +420 533 101 111, Fax: +420 543 216 619, E-mail: [dribo@dribo.cz](mailto:dribo@dribo.cz), Internet: <http://www.dribo.eu>

## Outdoor single-pole disconnectors DRIBO Flrm

These switching devices are used for the disconnection of end-position substations and parts of the no-load power lines. The DRIBO Flrm disconnectors are equipped with a simple arc quenching equipment, which provides for breaking of the circuit irrespective of the speed of manipulation. Disconnectors for rated voltage of 25 kV were tested with satisfactory results for the no-load opening of distribution transformer circuits with rated power of 630 kVA. When transformer circuits are opened under no-load conditions, no significant overvoltage effects are taking place.

The Flrm-k type disconnectors are designed for mounting on a console; those of Flrm-v type are designed for mounting 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.

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

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 Fiberlink 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.

## Technical data

Rated voltage	U	kV	25	38,5	38,5
rated current	$I_r$	A	400	400	1200
rated short-time current	$I_k$	kA	16	16	20
rated dynamic current	$I_p$	kA	40	40	50
permitted tension during the operation		kN	30	30	30
smallest phase pitch when placing the disconnectors side by side		mm	800	1200	1200
smallest phase pitch in off-tracking position of the middle phase		mm	500	700	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	90
rated lightning pulse withstand voltage across the isolating distance		kV	145	210	210

## 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.

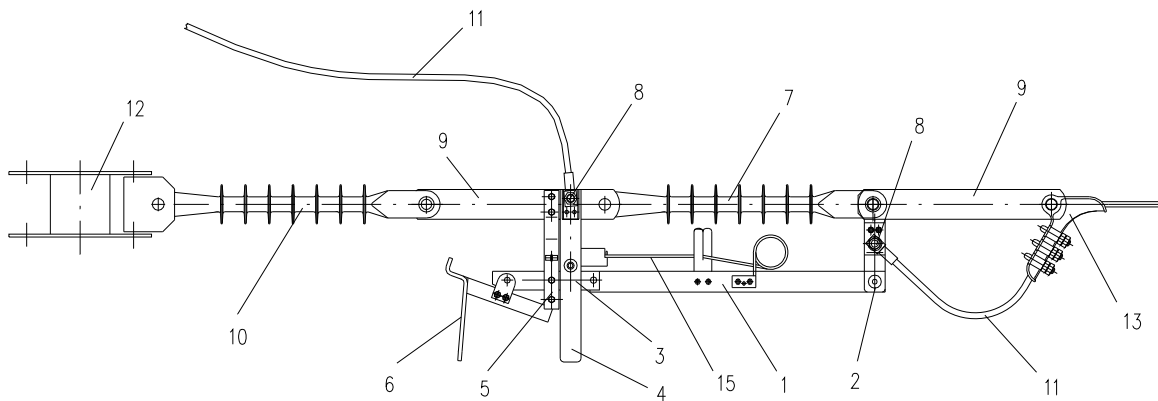
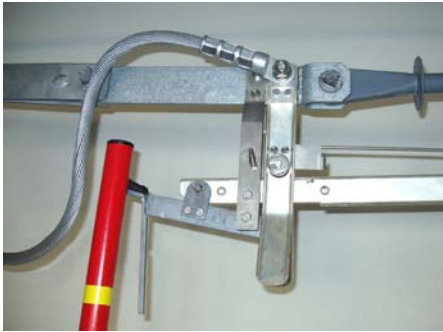
## Function description

### Opening:

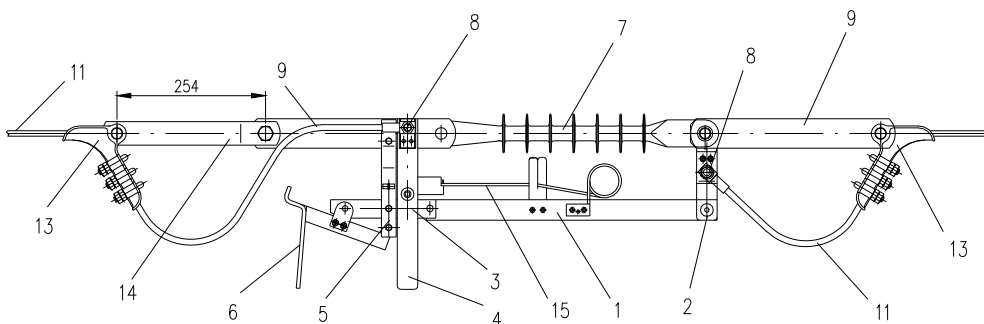
By pulling the on the control rod suspended over the upper edge of the control lever **6** the locking mechanism **5** opens, which releases the switching knife contact **1**. After loosening the switching knife contact, the current flows through by the arc quenching circuit **15**, connected in parallel. 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.



The **Firm-k** disconnector mounted on the anchoring insulator

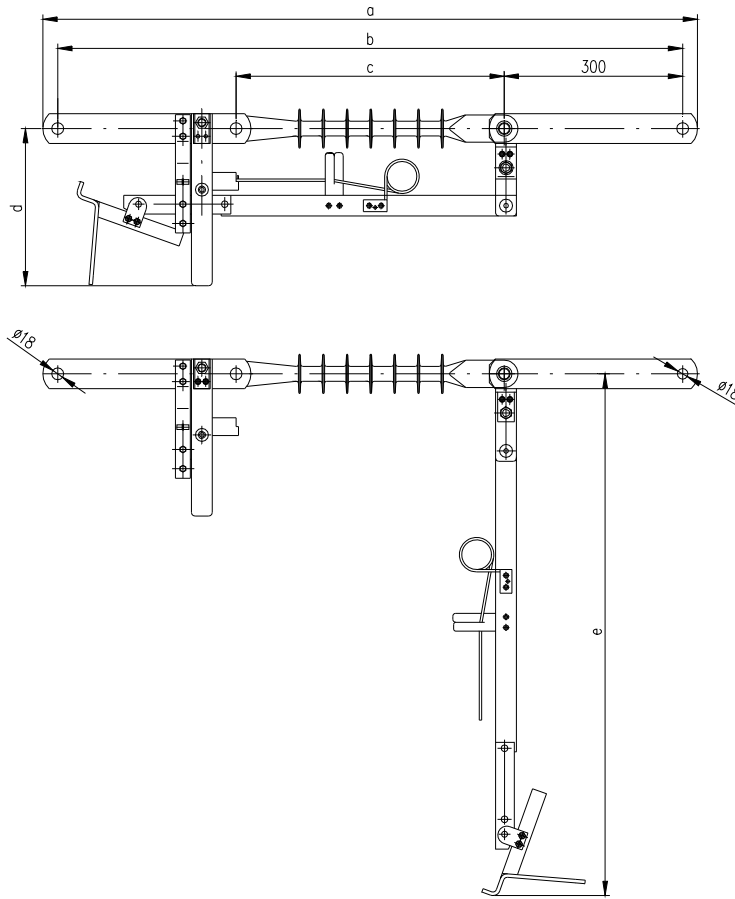


The **Firm-v** disconnector suspended on conductors

- |                           |                          |                                    |
|---------------------------|--------------------------|------------------------------------|
| 1 switching knife contact | 6 control lever          | 11 incoming conductor *            |
| 2 rotating contact        | 7 insulator              | 12 anchoring fixture *             |
| 3 sliding contact         | 8 incoming terminal M12  | 13 anchoring clamp terminal *      |
| 4 guiding fork            | 9 fixture                | 14 extension piece – fork with lug |
| 5 locking mechanism       | 10 anchoring insulator * | 15 quick-opening mechanism         |

\* does not constitute a part of the delivery

## Single-pole disconnectors FIRM



rated voltage kV	type	part nr.	rated current A	a mm	b mm	c mm	d mm	e mm	weight kg
25	Firm-k	095 0541M	400	1101	1051	451	265	880	6,0
25	Firm-v	095 0541MV	400	1101	1051	451	265	880	7,1
38,5	Firm-k	095 0542M	400	1222	1172	572	265	1000	6,4
38,5	Firm-v	095 0542MV	400	1222	1172	572	265	1000	7,5
38,5	Firm-k	095 0543M	1200	1222	1172	572	237	1000	7,1
38,5	Firm-v	095 0543MV	1200	1222	1172	572	237	1000	8,2

The Firm-v disconnectors are delivered inclusive of the fork with lug – manufactured by the company ELBA, part No. 211 531.

## 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)
- 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