

Outdoor load disconnectors Fla 15/97

single- and three-pole design
rated voltage 12, 25 and 38.5 kV
rated current 400 and 630 A



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ISO 9001
BUREAU VERITAS
Certification



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The Fla 15/97 outdoor load-disconnectors with arc quenching vacuum chambers represent a series of advantages for the customers, not only by its state-of-the-art performances but also its environmental friendliness. In its design the products as such exhibit a link with the Fla 15/60 load-disconnectors which have successfully been proven in operation and which are manufactured on the basis of design documents originating from the German company Driescher. The external inlets and the operating principle of this switching device remain unchanged. Since many years the Fla 15/60 load-disconnectors are well known due to their high level of operation reliability and operation safety. Currently there are more than 30 000 pieces of Fla 15/60 load-disconnectors in operation.

The load-disconnectors comply with the following standards: EN 62271-1, EN 62271-102, EN 60265-1. Supporting insulators used with this load-disconnectors meet the pollution requirements as specified by class IV, to ČSN 33 0405.

The simple and rugged design of Fla load-disconnectors was tested in various climatic conditions with excellent results.

The steel, welded base frame of the switching device is made of open steel profiles, the form of which is very adequate for hot galvanization. This kind of surface treatment provides for a corrosion free surface of the frame and makes easy the inspection of the surface. Hot galvanized coating is deposited also on load-disconnector shafts, seated in bronze bearings, and on all other steel parts including the accessories. All current carrying parts are manufactured of silver coated electrolytical

The construction of the load disconnectors, the quality level of material used and care exercised in the production process, which is governed by the principles of the ISO 9001:2000 standard, is a guarantee for low operation and maintenance costs in the future.

Under normal operating conditions it is not necessary for the load disconnectors to undergo a preventive maintenance during the period of twenty years.

copper and as a bulk they form a loop-free path for the current flow.

The cross sections of current carrying parts are dimensioned adequately. The pressure exerted by contact pressure springs, made of stainless steel, are one of the prerequisites for a defect-free switching process, even after many years of operation in severest operating conditions and in areas where icing can be encountered.

The load-disconnectors are delivered with supports made of cycloaliphatic resin.

The load-disconnectors can be completed with built-in earthing switches mounted on that side where a fixed or movable support is installed. When using the earthing switches the operating drive mechanism must be of double or triple design, with a rugged mechanical interlocking system that prevents an incorrect handling with the system. In such a case the number of draw bars and rocking bearings is to be increased adequately.

Load-disconnectors and the earthing switches are operated by external manual or motor operated drive mechanisms.

The load-disconnectors sometimes are equipped with additional encapsulated contacts (protection degree IP 44), mounted directly to the frame. These contacts serve for a remote indication of both the ON and OFF operating state of the disconnector.

The load-disconnectors feature a high margin of short-circuit withstand capacity, both for the load-disconnectors and for the built-in earthing switches.

Technical data

Fla 15/97						
rated voltage	U _r	kV	12	25	38,5	
rated current	I _r	A	400 / 630	400 / 630	400 / 630	
rated short-time current	I _k	kA	16	16	16	
rated peak withstand current	I _p	kA	40	40	40	
rated making current	I _{ma}	kA ¹⁾	25	25	10	
rated breaking current – cos φ 0,7	I ₁	A	630	630	630	
rated breaking current of closed loop	I _{2a}	A	630	630	630	
rated breaking current of no-load cable	I _{4a}	A	25	25		
rated breaking current of the earth fault	I _{6a}	A	200	200	200	
rated cable charging breaking current below earth fault conditions	I _{6b}	A	32	32	32	

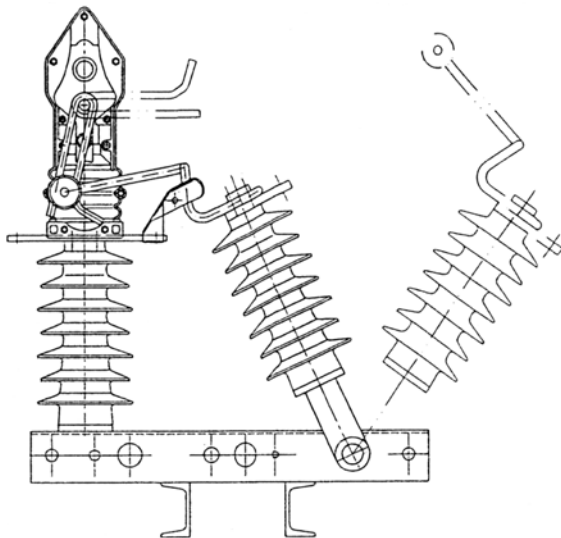
¹⁾ At a sufficiently quick hand control.

The load-disconnector is capable of breaking 2000 times all the above current values

Withstand voltages of Fla 15/97 load disconnectors

rated voltage	kV	12	25	38,5
rated short-time withstand power frequency voltage / 1min. to be applied in both dry and wet environmental conditions				
against the earth, across the poles and between disconnected contacts	kV	28	50	80
across the isolating distance	kV	32	60	90
rated lightning pulse withstand voltage				
against the earth, across the poles and between disconnected contacts	kV	75	125	180
across the isolating distance	kV	85	145	210

Function description



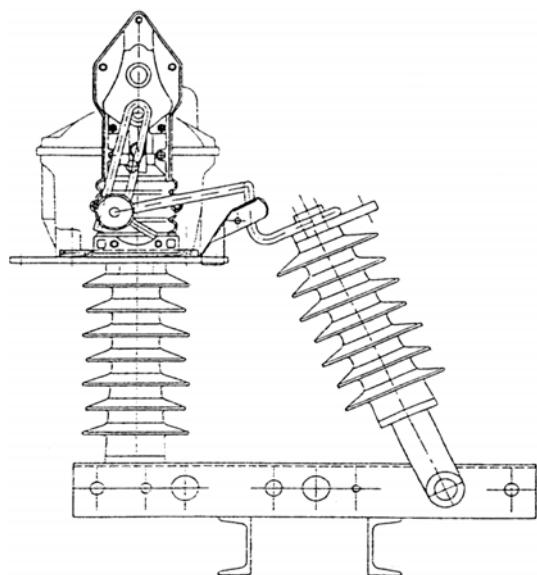
When in ON position the vacuum arc quenching chamber, together with the switching mechanism installed in a case made of insulating material, is connected in parallel to the current carrying path. This path has been designed for the through-flow of rated current values. When switching the load-disconnector OFF the main contacts first disconnect and in this way the whole current is redirected to the branch in parallel. In this branch we can find the vacuum chamber and additional switching device connected in series with the chamber. This circuit mechanically is designed as a fork with switching rollers, which are shaped in form of a half dish.

As soon as the main contacts have separated to an appropriate distance the contacts inside the vacuum chamber disconnect and the resulting arc gets cut during the first pass of the current through zero. Subsequently, the rocking insulator moves and a distance between the load-disconnector contacts now is clearly visible. The life expectancy of the vacuum chamber and the quick breaking mechanism is 5000 cycles, at minimum. All components installed in the current carrying path are silver coated. All metallic parts of the quick breaking mechanism are made of stainless steel.

Compatibility between the old and the new chambers

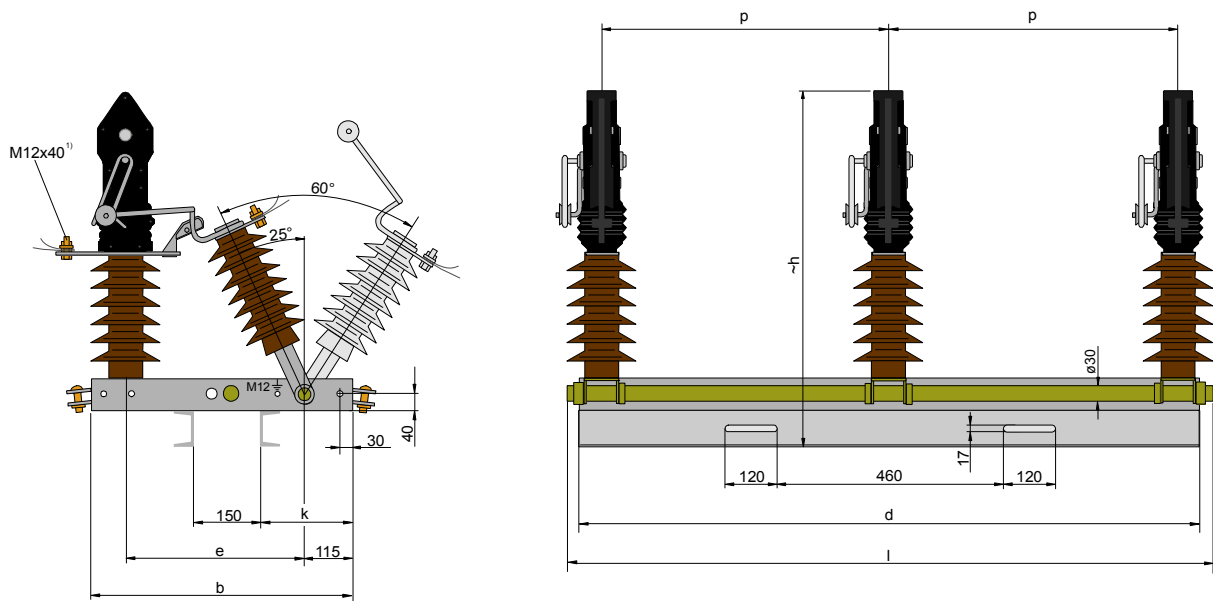
The Fla 15/60 load-disconnectors, which already were built-in into the frame, can additionally be equipped with vacuum arc quenching chambers by using adapters (Cu bus bars). The figure shows a retrofitted Fla 15/60 load-disconnector, which now becomes the Fla 15/97 type.

Note: With some of the load-disconnector types also the control and contacting arms on movable supports have to be replaced.



Three-pole outdoor load-disconnector Fla 15/97

for mounting on wooden and concrete pole



1) hexagonal head screw, washer and spring washer

U _r [kV]	I _r [A]	p	b	d	e	≈ h	k	l	weight approx. [kg]	
									w/o earth.sw.	w. earth.sw.
12	400 / 630	700	600	1465	405	704	219	1530	110	115
25	400 / 630	700	600	1465	405	774	215	1530	125	140
25	400 / 630	1000	600	2065	405	774	215	2130	135	150
38,5	400 / 630	1000	650	2065	455	884	265	2130	150	170

The process of assembly of the suspension mechanism, the allocation of interconnecting bands, the arrangement of drives and permitted deviations of the hinges from a straight line are the same as with the Fla 15/60 outdoor load-disconnectors.