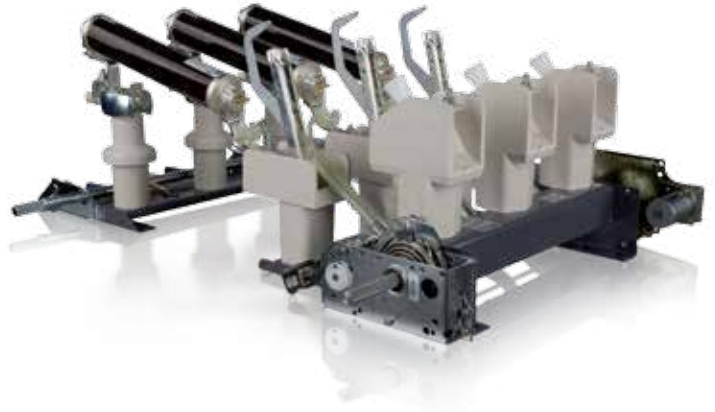


# Indoor Air Switch Disconnecter, NAL/NALF

Rated voltage: 12-36 kV  
Rated current: 400-1250 A

NAL-type switch disconnectors are based on a modular principle, which gives it a wide range of functionality. With a unique design that extinguishes electric arcs and enables high switching capacity, they represent an attractive solution as a key breaking element for applications in enclosed switchgear and transformer compact substations. In combination with type CEF current limiting fuses, NALF fuse switch disconnectors ensure control over the full range of overload and short-circuit currents.



## Introduction

The basic unit of NAL/NALF consists of a frame with insulators and current carrying parts. Two different types of operating mechanisms, snap action mechanism type K or stored spring energy mechanism type A, can be mounted on the frame. Fuse bases type F, with or without fuse tripping mechanism, and an earthing switch type E/EB, suitable for both direct mounting and free standing components, complete the basic equipment of a switch disconnector. These modules can be easily configured according to customer expectations.

Accessories, such as shunt trip, under-voltage release, auxiliary switches, motor operation and various systems for manual operation can easily be added.

To ensure correct operation for all relevant currents, the switch disconnector system NAL/NALF is equipped with a dual arc extinguishing system (arc balst and air balst). A well balanced utilization of these two effects has resulted in high reliability for all relevant currents.

NAL/NALF switch disconnectors are manufactured according to global quality and environmental standards and confirmed by ISO 9001 and ISO 14001 certificates. In addition, they are 98.64 percent recyclable.

The NAL/NALF brand is well known around the world, and more than 600,000 switches have been produced so far. It has been undergoing continuous development to satisfy users' demands.

The main areas of application of NAL/NALF switch disconnectors are as:

- Line switch disconnectors in medium-voltage networks,
- Switch disconnectors with fuses for the switching and protection of:
  - Distribution transformers
  - Motors

TABLE I. Main data

Rated voltage	Un	kV	12			17.5			24			36		
Rated current	In	A	400	630	1250	400	630	1250	400	630	1250	630	800	800
Max. rated current	I	A	400	630	1150	400	630	1150	400	630	1150	630	800	1000
Short circuit making capacity	I <sub>ma</sub>	kA peak.	67	67	67	50	50	50	50	50	50	50	50	50
Peak withstand current	I <sub>dyn</sub>	kA peak.	82	82	82	82	82	82	82	82	82	66	66	66
Short time current 1 sec.			31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5			
2 sec.	I <sub>th</sub>	kA eff.	25	25	25	25	25	25	25	25	25	25	25	25
3 sec.			20	20	20				16	16	16			
Mainly active load breaking capacity <sup>1)</sup>														
(test duty 1 and 2, IEC 60265-1 (IEC 265))	I	A	400	630	1250	400	630	1250	400	630	1250	630	800	800
Rated cable/line charging breaking capacity	I	A	150	150	150	100 <sup>5)</sup>	100 <sup>5)</sup>	100 <sup>5)</sup>	80	80	80	45	45	45
IEC 60265-1 (IEC 265))														
Mainly inductive breaking capacity cos φ = 0,15		A	16	16	16	16	16	16	16	16	16	16 <sup>3)</sup>	16 <sup>3)</sup>	16 <sup>3)</sup>
Rated earth fault breaking capacity IEC 60265-1 (IEC 265)														
Earth fault breaking capacity, fig. 6	I	A	150	150	150	70	70	70	75	75	75			
Capacitive breaking capacity, fig. 7	I	A	90	90	90	40	40	40	31.5	31.5	31.5	50	50	50
Max. breaking capacity in co-operation with fuses IEC 62271-105 (IEC 420 1990-11)		A	1600	1600		1600	1600		900	900		300*		
Max. fuse size <sup>2)</sup>	In	A	125	125		125	125		80	80		40	40	
Power frequency withstand voltage 50 Hz 1 min.:														
– to earth and between poles		kV	42			45			55			80		
– across isolating distance		kV	42			60			70			88		
Impulse withstand voltage 1.2/50 μs:														
– to earth and between poles		kV	75			95			125			170		
– across isolating distance		kV	85			110			145			195		
Pole distance		mm	150, 170, 210			170, 210			170 <sup>4)</sup> , 235, 275			360		
Max. operating torque at:												80–100 Nm		
– closing K/A mech.		Nm				115–120 Nm						K mech. 80–100 Nm		
– opening K/A mech.		Nm				K mech. 120 Nm/A mech. 3 Nm						/ A mech. 3 Nm		
Operating angle on the shaft		degrees				130						120		
Arc time		ms				40 – 60						60		

\* – IEC 420 1990-11

<sup>1)</sup> At In = 630 A, 100 x CO. At In = 1250 A, 20 x CO<sup>2)</sup> Max. fuse size is ref. to time current characteristics for CEF<sup>3)</sup> Power factor = 0,1<sup>4)</sup> With insulating barriers<sup>5)</sup> At 18,2 kV**Earthing switch type E for NAL/NALF and type EB**

Rated voltage	Un	kV	12	17.5	24	36
Peak withstand current <sup>1)</sup>	I <sub>dyn</sub>	kA peak.	62/82	40/82	38/82	66
Short-circuit current 1 sec.			31.5	31.5	31.5	
2 sec.	I <sub>th</sub>	kA eff.	25	20	20	25
3 sec.			20	16	16	
Short-circuit making capacity	I <sub>ma</sub>	kA peak.	62/67	40/62.5	38/50	40
Power frequency withstand voltage 50 Hz 1 min.		kV	42	45	50	80
Impulse withstand voltage 1.2/50 μs		kV	75	95	125	170
Pole distance		mm	150, 170, 210	170, 210	170, 235, 275	360

<sup>1)</sup> When fed from switch disconnector/earthing switch side.**ABB Sp. z o.o.****Branch in Przasnysz**

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