DC Miniature Circuit Breakers
Ex9BP up to 1000 V DC



- DC Miniature Circuit Breakers
- Non-polarized, suitable for photovoltaic applications
- Tested according to IEC / EN 60947-2
- Rated short circuit breaking capacity I_{cu} 6 kA
- Rated operating voltage U_e of 250 V DC per pole
- Width 2 and 4 modules
- Tripping characteristics C, K
- Rated current up to 63A
- Wide range of accessories

DC miniature circuit breakers Ex9BP are designed for direct current applications. Thanks to their polarity independency are suitable for photovoltaic aplications.

It can be combined with wide range of accessories including auxiliary and signal contacts, shunt trip release and undervoltage release. It is possible to create diversed combination of accessories. These combinations are only limited by total number, not by the type of accessories - all components fit together. It can be used up to three units of auxiliary or alarm contacts plus up to two units for release units.

Type Key

Ex9	BP	4P	DC 1000 V	C	32
Product family	Product	Poles	Rated voltage	Tripping curve	Rated current
Ex9	Non-polarized DC MCBs	2, 4	DC 500 V DC 1000 V	C, K	10 — 63 A

Certification marks

CE

DC MCBs **Ex9BP** up to 1000 V DC

Accessories



Aux. or signal contacts **AX, AL, AXL** Up to 3 units	Voltage or trip releases **SHT, UVT** Up to 2 units	Miniature Circuit Breaker **Ex9BP** 2, 4-module width

Auxiliary contacts AX31

Alarm contact AL3

Auxiliary and alarm contact AXL31

Shunt trip releases SHT31

Undervoltage releases UVT31

All accessories are mounted to the MCBs Ex9BP from the left. The undervoltage release UVT in PV system is intended e.g. for safe remote disconnection of DC part from installation.

DC MCBs **Ex9BP** up to 1000 V DC

C-Characteristic, 2-module, 500 V DC



Rated current	Width	Char.	Article No.	Type	Packing
10 A	2MU	C	111559	Ex9BP 2P DC500V C10	1/6/72
13 A	2MU	C	111560	Ex9BP 2P DC500V C13	1/6/72
16 A	2MU	C	111561	Ex9BP 2P DC500V C16	1/6/72
20 A	2MU	C	111562	Ex9BP 2P DC500V C20	1/6/72
25 A	2MU	C	111563	Ex9BP 2P DC500V C25	1/6/72
32 A	2MU	C	111564	Ex9BP 2P DC500V C32	1/6/72
40 A	2MU	C	111565	Ex9BP 2P DC500V C40	1/6/72
50 A	2MU	C	111566	Ex9BP 2P DC500V C50	1/6/72
63 A	2MU	C	111567	Ex9BP 2P DC500V C63	1/6/72

C-Characteristic, 4-module, 1000 V DC



Rated current	Width	Char.	Article No.	Type	Packing
10 A	4MU	C	111568	Ex9BP 4P DC1000V C10	1/3/36
13 A	4MU	C	111569	Ex9BP 4P DC1000V C13	1/3/36
16 A	4MU	C	111570	Ex9BP 4P DC1000V C16	1/3/36
20 A	4MU	C	111571	Ex9BP 4P DC1000V C20	1/3/36
25 A	4MU	C	111572	Ex9BP 4P DC1000V C25	1/3/36
32 A	4MU	C	111573	Ex9BP 4P DC1000V C32	1/3/36
40 A	4MU	C	111574	Ex9BP 4P DC1000V C40	1/3/36
50 A	4MU	C	111575	Ex9BP 4P DC1000V C50	1/3/36
63 A	4MU	C	111576	Ex9BP 4P DC1000V C63	1/3/36

K-Characteristic, 2-module, 500 V DC



Rated current	Width	Char.	Article No.	Type	Packing
10 A	2MU	K	111577	Ex9BP 2P DC500V K10	1/6/72
13 A	2MU	K	111578	Ex9BP 2P DC500V K13	1/6/72
16 A	2MU	K	111579	Ex9BP 2P DC500V K16	1/6/72
20 A	2MU	K	111580	Ex9BP 2P DC500V K20	1/6/72
25 A	2MU	K	111581	Ex9BP 2P DC500V K25	1/6/72
32 A	2MU	K	111582	Ex9BP 2P DC500V K32	1/6/72
40 A	2MU	K	111583	Ex9BP 2P DC500V K40	1/6/72
50 A	2MU	K	111584	Ex9BP 2P DC500V K50	1/6/72
63 A	2MU	K	111585	Ex9BP 2P DC500V K63	1/6/72

K-Characteristic, 4-module, 1000 V DC



Rated current	Width	Char.	Article No.	Type	Packing
10 A	4MU	K	111586	Ex9BP 4P DC1000V K10	1/3/36
13 A	4MU	K	111587	Ex9BP 4P DC1000V K13	1/3/36
16 A	4MU	K	111588	Ex9BP 4P DC1000V K16	1/3/36
20 A	4MU	K	111589	Ex9BP 4P DC1000V K20	1/3/36
25 A	4MU	K	111590	Ex9BP 4P DC1000V K25	1/3/36
32 A	4MU	K	111591	Ex9BP 4P DC1000V K32	1/3/36
40 A	4MU	K	111592	Ex9BP 4P DC1000V K40	1/3/36
50 A	4MU	K	111593	Ex9BP 4P DC1000V K50	1/3/36
63 A	4MU	K	111594	Ex9BP 4P DC1000V K63	1/3/36

Technical Data **Ex9BP** up to 1000 V DC

DC Miniature Circuit Breakers up to 1000 V DC

General parameters		
Non-polarized, suitable for general DC as well as Photovoltaic applications		
Accessories		
Auxiliary contacts	AX3111, AX3122	100540, 100542
Alarm contact	AL3111	100541
Auxiliary and alarm contact	AXL31	100543
Shunt trip releases	SHT31, SHT3111	100544-100546, 100547-100549
Undervoltage releases	UVT31, UVT3101, UVT3110	100550-100551, 100552-100553, 100554-100555
Max. number of installed accessories is 3 pcs of one contact units (AX3111, AL3111) or 2 pcs of two contact units (AX3122, AXL31) and 2 pcs of releases (SHT31, UVT31)		

Electrical parameters	
Tested according to	IEC/EN 60947-2
Rated operating voltage U_e	500 (2P), 1000 (4P) V DC
Rated breaking capacity I_{cu}	6 kA
Rated current I_n	10 — 63 A
Tripping characteristics	C, K
Rated impulse withstand voltage U_{imp}	4 kV (2P), 6 kV (4P)
Rated insulation voltage U_i	1 000 V DC
Electrical service life	300 operation cycles
Line voltage connection	arbitrary above or below

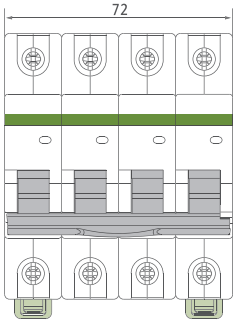
Mechanical parameters	
Device width	18 mm (per pole/module)
Device height	83 mm (89 mm including rail clip)
Frame size	45 mm
Mounting	easy fastening onto 35 mm device rail (DIN)
Degree of protection	IP20 terminals
Terminals	combined lift + open mouthed
Terminal capacity	1 — 35 mm^2
Fastening torque of terminals	3.5 Nm
Busbar thickness	0.8 — 2 mm
Mechanical service life	20 000 operation cycles
Ambient temperature	-35 — +70 °C
Altitude	≤ 2 000 m
Relative humidity	≤ 95 % at 20°C, ≤ 50 % at 40°C
Resistance to humidity and heat	class 2
Pollution degree	3
Installation class	III
Weight	0.12 kg (per pole/module)

DC Miniature Circuit Breakers up to 1000 V DC

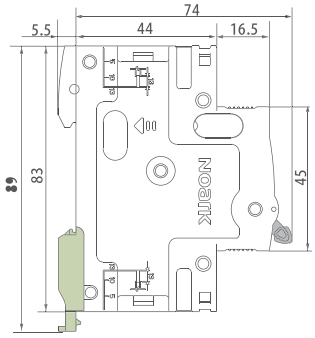
Dimensions



2P

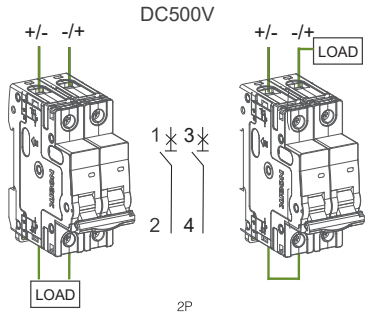


4P

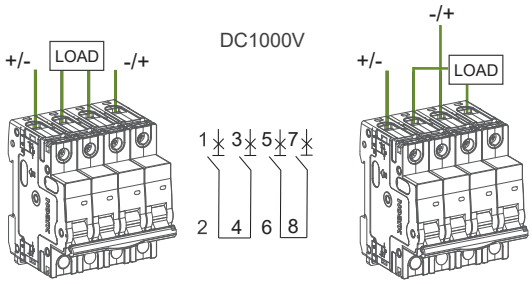


2P 4P

Wiring diagrams



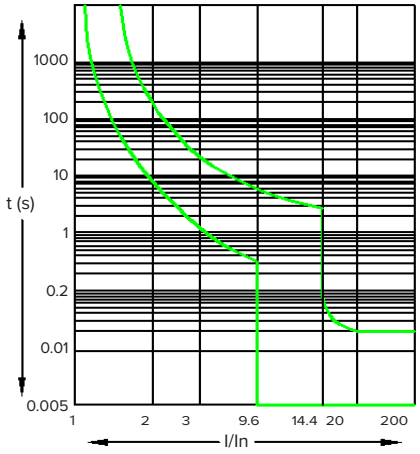
2P



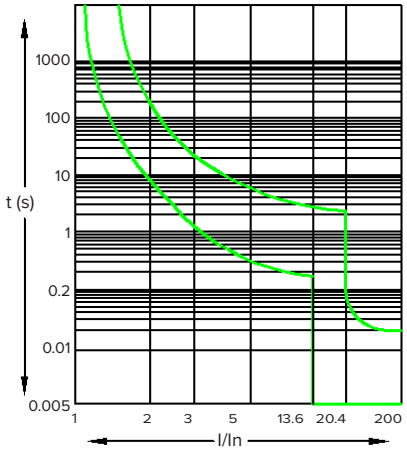
4P

Tripping characteristics

Characteristic C



Characteristic K



DC Miniature Circuit Breakers up to 1000 V DC

Dependence of tripping characteristics on ambient temperature									
T [°C]	**I_n (T) [A]**								
	10 A	**13 A**	**16 A**	**20 A**	**25 A**	**32 A**	**40 A**	**50 A**	**63 A**
-20	13.5	16.3	20.0	24.5	29.8	39.5	50.5	60.0	77.5
-15	13.3	15.9	19.8	24.3	29.7	39.3	50.4	59.8	76.3
-10	13.0	15.7	19.5	24.0	29.5	39.0	50.2	59.5	75.0
-5	12.7	15.4	19.2	23.8	29.3	38.8	50.0	59.2	73.0
0	12.5	15	19.1	23.7	29.2	38.6	48.8	59.0	71.8
5	12.3	14.7	18.8	23.5	29.0	38.4	48.6	58.8	70.6
10	12.1	14.3	18.6	23.3	28.8	38.2	48.4	56.5	69.0
15	12.0	14	18.5	23.1	28.6	38.0	48.1	55.0	67.5
20	11.8	13.7	18.3	22.8	28.4	37.8	47.8	54.5	66.2
25	11.5	13.4	18.0	22.6	28.2	37.5	47.0	52.5	64.5
30	10	13	16	20	25	32	40	50	63
35	9.9	12.8	15.7	19.7	24.6	31.5	39.2	48.8	61.5
40	9.8	12.5	15.4	19.3	24.3	31.1	38.8	47.0	58.7
45	9.8	12.2	15.1	18.8	24.0	30.8	38.3	45.5	55.8
50	9.6	12	14.9	18.5	23.8	30.1	38.0	44.0	53.5
55	9.5	11.7	14.7	18.2	23.5	29.5	36.5	42.5	51.7
60	9.0	11.5	14.5	17.8	23.0	28.5	35.0	41.5	49.2
65	8.6	11.2	14.0	17.5	22.0	27.5	34.0	40.5	47.9
70	8.0	11	13.8	17.3	21.5	27.0	32.5	38.0	46.8

Power loss per pole									
I_n [A]	**10 A**	**13 A**	**16 A**	**20 A**	**25 A**	**32 A**	**40 A**	**50 A**	**63 A**
P [W]	1.8	3.1	3.1	3.1	3.9	3.9	4.7	4.7	6.2