



NB1-63 DC Circuit Breaker



• Advantages and benefits

Can be operated up to 63 A and 1,000 VDC

Safe switching and disconnecting of individual strings under load

Selective remote tripping of individual strings under load

Signalling the switching state of the NB1-63DC in the individual strings

New MCB's for photovoltaic applications.



• DC load disconnecting switch

Safe switching under load. In case of faults or maintenance work, individual strings can be safely and selectively switched under load.

The NB1-63DC has the function of isolation switch. For ungrounded power grid, in case of the MCB tripping or manually disconnecting, all poles are isolated from the mains, the PV string can have a reliable protection.

• Remote tripping and signalling

Remote tripping of the NB1-63 DC can be realised with an under-voltage V9 or shunt operation release S9.

An optional auxiliary (on or off) XF9 or signal contact XF9J (over-current or short circuit) signals the actual switching state of the device in the individual strings.



NB1-63DC DC Circuit Breaker

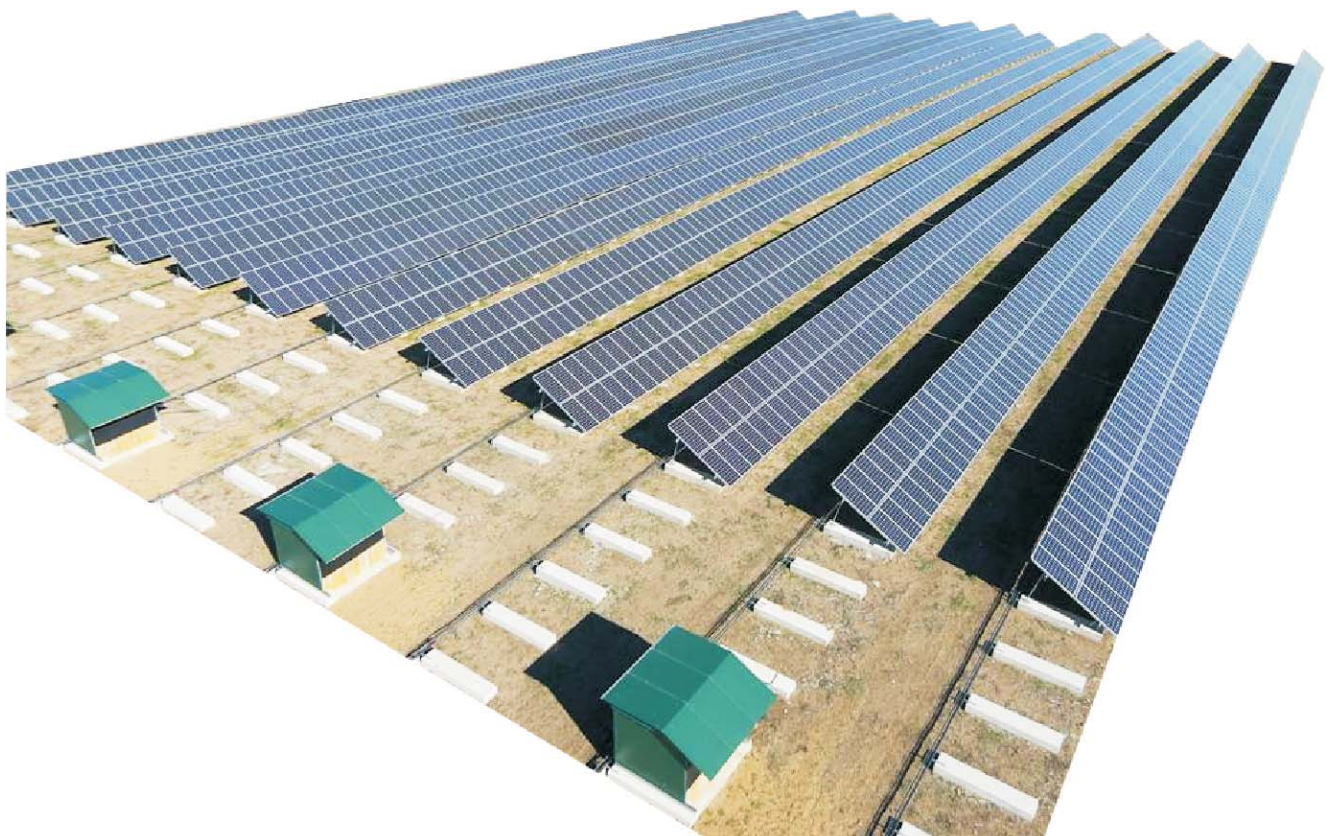
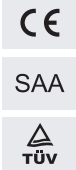
1. General & features

1.1 General

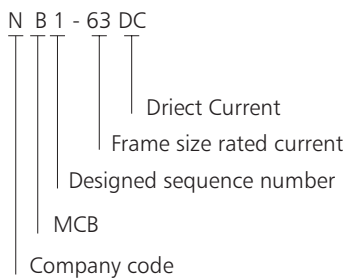
- 1.1.1 Certificates: CCC,CE,CB,SAA,TUV;
- 1.1.2 Standard: IEC/EN 60947-2 ,RoHS;
- 1.1.3 Rated voltage up to 1000V, Rated current up to 63A;
- 1.1.4 Protection of circuits against overload currents;
- 1.1.5 Protection of circuits against short-circuit currents;
- 1.1.6 NB1-63 DC circuit-breakers are used in communication systems and PV DC systems.

1.2 Features

- 1.2.1 Hight breaking capacity
- 1.2.2 Connection type :Wire and busbar
- 1.2.3 Storage operation make on/off faster
- 1.2.4 Installation and disassembly convenient
- 1.2.5 color coded contact position indicator provides visual indication of the device status and insulation function.



2. Type designation



3. Operation conditions

- 3.1 Ambient temperature: $-35^{\circ}\text{C} \sim +70^{\circ}\text{C}$ (Refer to 4.3)
- 3.2 The atmosphere condition: $\leq 95\%$
- 3.3 Pollution degree: II
- 3.4 Altitude: $\leq 2000\text{m}$ (if exceed 2000m, Refer to 4.4)

4. Technical data

- 4.1 Classification
 - 4.1.1 Rate Current I_n : 1A, 2A, 3A, 4A, 6A, 10A, 13A, 16A, 20A, 25A, 32A, 40A, 50A, 63A
 - 4.1.2 Number of poles: 1P, 2P, 4P
 - 4.1.3 Tripping curves: C Type, (7~10) I_n
- 4.2 Parameters
 - 4.2.1 Rated breaking capacity I_{cn}

Rated current I_n (A)	Number of poles	Rated voltage U_e (V)	Rated breaking capacity I_{cn} (A)
1~63	1	250	6000
	2	500	6000
	4	1000	6000

- 4.2.2 Electrical and mechanical life
 - a. Electrical life: > 1500
 - b. Mechanical life: $> 20,000$
- 4.2.3 Rated impulse withstand voltage U_{imp} : 4KV
- 4.2.4 (28-32) $^{\circ}\text{C}$ ambient temperature over-current protection features.

Test	Test current	Initial state	Time limit for tripping or not tripping	Expected result	Remarks
a	$1.05I_n$	Cold state a	$t < 1\text{h}$	Not tripping	
b	$1.30I_n$	Right after test number a	$t < 1\text{h}$	Tripping	The current is rising within 5s
c	$7I_n$	Cold state a	$0.2\text{s} < t < 15\text{s}$ ($I_n \leq 32\text{A}$) $0.2\text{s} < t \leq 30\text{s}$ ($I_n > 32\text{A}$)	Tripping	
d	$10I_n$	Cold state a	$t < 0.1\text{s}$	Tripping	

Note: The terminology "Cold state" means that the test is performed at the base calibration temperature with no load prior to the test.

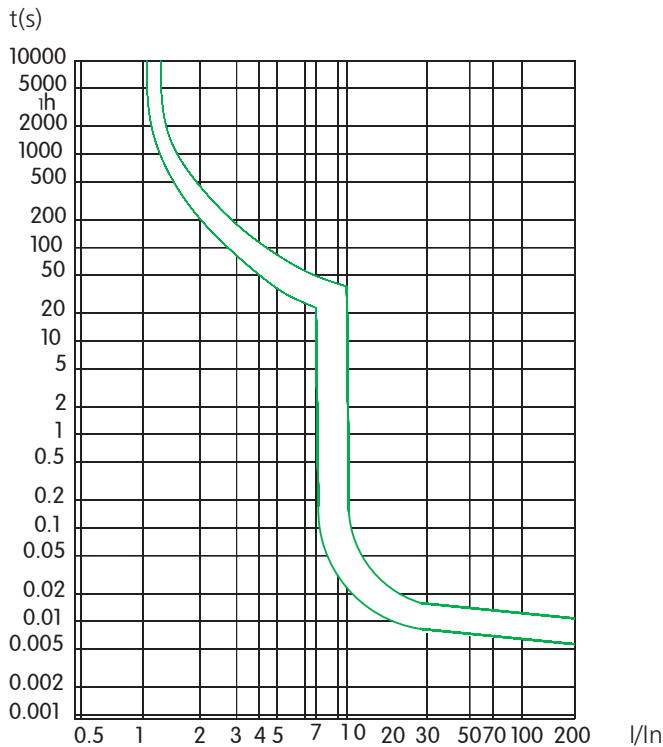
4.3 Temperature derating

Rated current (A)	Temperature compensation coefficient under various operational temperature.											
	-35℃	-30℃	-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	70℃
1	1.3	1.26	1.23	1.19	1.15	1.11	1.05	1	0.96	0.93	0.88	0.83
2	2.6	2.52	2.46	2.38	2.28	2.2	2.08	2	1.92	1.86	1.76	1.66
3	3.9	3.78	3.69	3.57	3.42	3.3	3.12	3	2.88	2.79	2.64	2.49
4	5.2	5.04	4.92	4.76	4.56	4.4	4.16	4	3.84	3.76	3.52	3.32
6	7.8	7.56	7.38	7.14	6.84	6.6	6.24	6	5.76	5.64	5.28	4.98
10	13.2	12.7	12.5	12	11.5	11.1	10.6	10	9.6	9.3	8.9	8.4
13	17.16	16.51	16.25	15.6	14.95	14.43	13.78	13	12.48	12.09	11.57	10.92
16	21.12	20.48	20	19.2	18.4	17.76	16.96	16	15.36	14.88	14.24	13.44
20	26.4	25.6	25	24	23	22.2	21.2	20	19.2	18.6	17.8	16.8
25	33	32	31.25	30	28.75	27.75	26.5	25	24	23.25	22.25	21
32	42.56	41.28	40	38.72	37.12	35.52	33.93	32	30.72	29.76	28.16	26.88
40	53.2	51.2	50	48	46.4	44.8	42.4	40	38.4	37.2	35.6	33.6
50	67	65.5	63	60.5	58	56	53	50	48	46.5	44	41.5
63	83.79	81.9	80.01	76.86	73.71	70.56	66.78	63	60.48	58.9	55.44	52.29

4.4 Altitude derating

Tripping type	Rated current In (A)	Current correction factor			For example
		≤2000	2000~3000m	≥3000m	
C	1,2,3,4,6,10, 13,16,20,32, 40,50,63	1	0.9	0.8	Rated current of 10A products rated current derating 2500m:0.9×10=9A

4.5 Curves shown in Figure 1



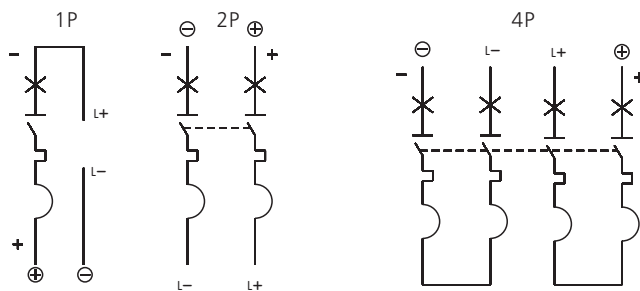
4.6 Wiring: Apply to 25 mm² wire connection terminals Tightening torque 2.5N·m

Rated current In (A)	Copper wire nominal cross sectional area(mm ²)
1~6	1
10	1.5
13,16,20	2.5
25	4
32	6
40,50	10
63	16

4.7 Each pole power consumption of the circuit breaker

Rated current In (A)	Each pole maximum power consumption(W)
1~10	2
13~32	3.5
40~63	5

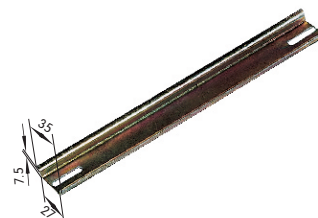
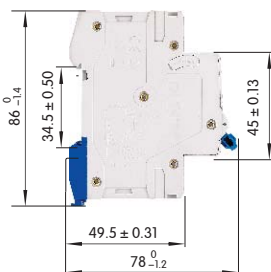
4.8 DC application wiring diagram shown in Figure 2



Wiring diagram description:

1. ⊕ Positive ⊖ Negative
2. L+ Load positive L- Load negative
3. Prohibit power reversed
4. Rated voltage: 1P:250V, 2P:500V, 4P:1000V
5. Strictly forbidden to remove the four poles products of sealing plug wiring operation.

5. Overall & installation dimensions(mm)





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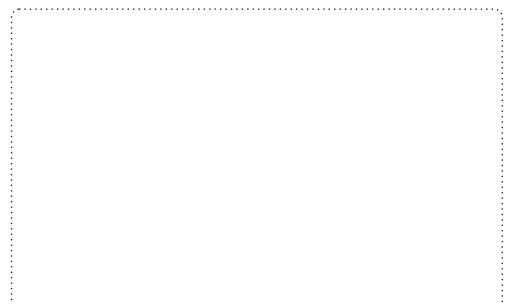
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