NB1 Miniature Circuit Breaker

1 Color coded contact position indicator provides visual indication of the device status and insulation function

4 Magnetic trip elements provide Type B, C and D trip characteristics (IEC and EN 60898), while bimetallic element protect against slight overload

5 Line and load side terminals accept bus bar connections for reduced costs and more efficient installation of multiple devices

2 Trip-free mechanism, device operation can not be defeated by holding the operator in the ON position

6 Heat dissipation gap provides better cooling

3 Breaking capacity up to 10000A

7 Extendable DIN-rail holder for easy installation

NB1 Miniature Circuit Breaker

1. General

1.1 Function

protection of circuits against short-circuit currents,
protection of circuits against overload currents,
switch,
isolation,
NB1 circuit-breakers are used in domestic installation, as well as in commercial and industry electrical distribution systems.

1.2 Selection

Technical data of the network at the point considered:
the earthing systems (TNS, TNC),
short-circuit current at the circuit-breaker installation point, which must always be less than the breaking capacity of this device,
Network normal voltage.
Tripping curves:
B curve (3-5In)
protection for people and big length cables in TN and IT systems.
C curve (5-10In)
protection for resistive and inductive loads with low inrush current.
D curve(10-14In)
protection for circuits which supply loads with high inrush current at the circuit closing
(LV/LV transformers, breakdown lamps).

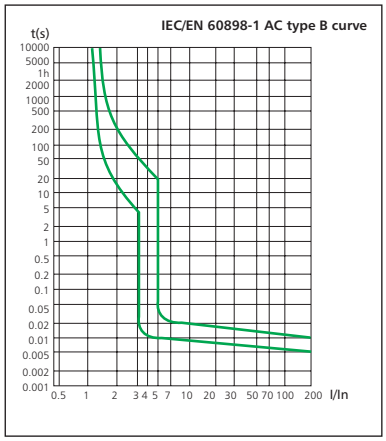
1.3 Approvals and certificates

Detailed information, please refer to Certificates Table on the last page.

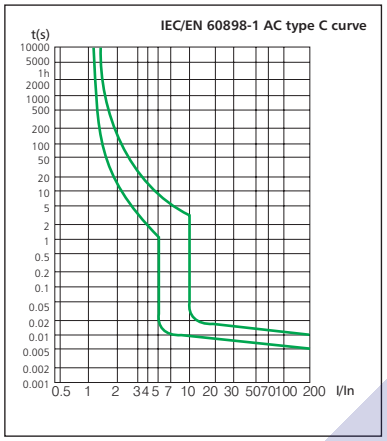
3. Technical data

3.1 curves

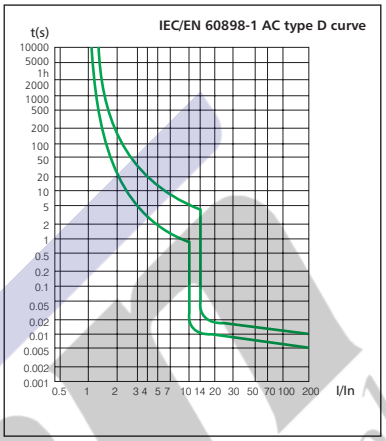
IEC/EN 60898-1 AC type B curve



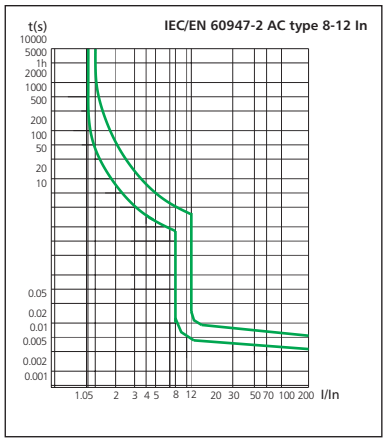
IEC/EN 60898-1 AC type C curve



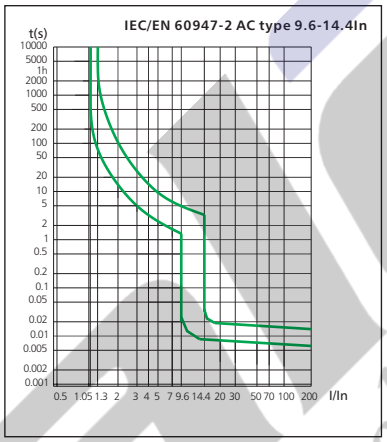
IEC/EN 60898-1 AC type D curve



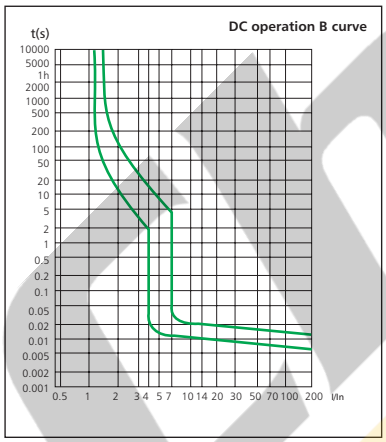
IEC/EN 60947-2 AC type 8-12 In



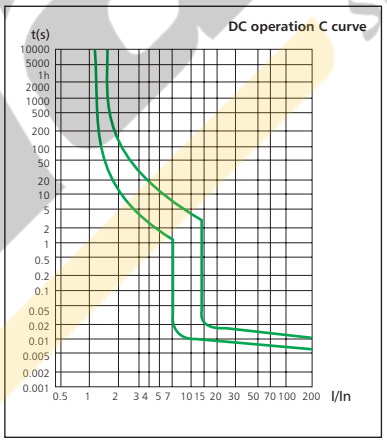
IEC/EN 60947-2 AC type 9.6-14.4In

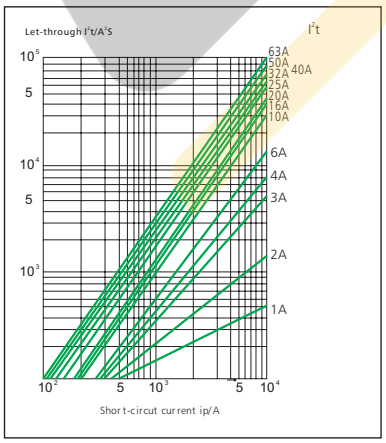


DC operation B curve



DC operation C curve





3.2

	Standard		IEC/EN 60898-1	IEC/EN 60947-2	UL1077	UL1077
Electrical features	Rated current In	A	1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63		1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63	
	Poles		1P, 1P+N, 2P, 3P, 3P+N, 4P	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P	1P, 2P
	Rated voltage Ue	V	230/400~240/415		277/480	110/125
	Insulation voltage Ui	V	500			
	Rated frequency		50/60Hz			DC
	Rated breaking capacity	A	6000/10000	6k	5k	10k
	Energy limiting class		3			
	Rated impulse withstand voltage(1.2/50) Uimp	V	4000			
	Dielectric test voltage at ind. Freq. for 1 min	kV	2			
	Pollution degree		2			
	Power loss per pole		Rated current (A)		Max power loss per pole (W)	
			1, 2, 3, 4, 5, 6, 10		2	
			13, 16, 20, 25, 32		3.5	
			40, 50, 63		5	
	Thermo-magnetic release characteristic		B, C, D	8-12In, 9.6-14.4In	B, C, D	4-7In, 7-14In
Mechanical features	Electrical life		4, 000			
	Mechanical life		20, 000			
	Contact position indicator		Yes			
	Protection degree		IP20			
	Reference temperature for setting of thermal element	℃	30			
	Ambient temperature (with daily average≤35℃)	℃	-5...+40(Special application please refer to P14 for temperature compensation correction)			
	Storage temperation	℃	-25...+70			
Installation	Terminal connection type		Cable/U-type busbar/Pin-type busbar			
	Terminal size top/bottom for cable	mm^2	25			
		AWG	18-4			
	Terminal size top/bottom for busbar	mm^2	10			
		AWG	18-8			
	Tightening torque	N*m	2.5			
		In-lbs.	22			
	Mounting		On DIN rail EN 60715 (35mm) by means of fast clip device			
	Connection		From top and bottom			
Combination with accessories	Auxiliary contact		Yes			
	Shunt release		Yes			
	Under voltage release		Yes			
	Alarm contant		Yes			

3.3 Selectivity

Load side: NB1-63, NB1-63H Curve B, C

In (A)	Power supply side: RT36-00 (fuse)								
	20	25	36	50	63	80	100	125	160
	Is (kA)								
⩽2	1.2	4	>12	>12	>12	>12	>12	>12	>12
3	0.7	1.2	3.8	5.3	6	6	6	6	6
4	0.6	0.9	2.5	3.8	6	6	6	6	6
6	0.5	0.8	1.9	2.5	4.5	5	6	6	6
10		0.7	1.4	2.2	3.2	3.6	6	6	6
16			1.2	1.8	2.6	3	5.6	6	6
20				1.5	2.2	2.5	4.6	6	6
25				1.3	2	2.2	4.1	5.5	6
32					1.7	1.9	3.8	4.5	6
40						1.7	3	4	5
50						1.5	2.6	3.5	4.5
63							2.4	3.3	4.5

Load side: NB1-63, NB1-63H Curve B, C

In (A)	Power supply side: NM8-100S/H/R								
	16	20	25	32	40	50	63	80	100
	Is (kA)								
⩽10	0.19	0.19	0.3	0.4	0.5	0.5	0.5	0.63	0.8
16			0.3	0.4	0.5	0.5	0.5	0.63	0.8
20					0.5	0.5	0.5	0.63	0.8
25						0.5	0.5	0.63	0.8
32							0.5	0.63	0.8
40								0.63	0.8
50									0.8
63									

3.4 Backup protection

Load side: NB1-63, NB1-63H Curve B, C

In (A)	Power supply side: RT16 series						
	40	50	63	80	100	125	160
	Is (kA)						
1~6	40	40	40	40	40	40	40
8~10	40	40	40	40	40	40	40
13	40	40	40	40	35	35	35
16	40	40	40	40	30	30	30
20	40	40	40	40	30	30	30
25	40	40	40	40	30	30	30
32	40	40	40	40	30	30	30
40	40	40	40	40	30	30	30
50	30	30	30	30	30	30	30
63	20	20	20	20	15	15	15

Load side: NB1-63, NB1-63H Curve B, C

In (A)	Power supply side: NM8					
	NM8-125S	NM8-125H	NM8-125R	NM8-250S	NM8-250H	NM8-250R
	Is (kA)					
1~6	15	18	18	15	15	15
10~20	12	15	15	12	12	12
32~40	12	15	15	12	12	12
50~60	12	15	15	12	12	12

A

3.5 Temperature derating

The maximum permissible current in a circuit breaker depends on the ambient temperature where the circuit breaker is placed. Ambient temperature is the temperature inside the enclosure or switchboard in which the circuit breakers are installed.
The reference temperature is 30℃

Ambient temperature → / Rated current(A) ↓	-35℃	-30℃	-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	70℃
1	1.30	1.26	1.23	1.19	1.15	1.11	1.05	1.00	0.96	0.93	0.88	0.83
2	2.60	2.52	2.46	2.38	2.28	2.20	2.08	2.00	1.92	1.86	1.76	1.66
3	3.90	3.78	3.69	3.57	3.42	3.30	3.12	3.00	2.88	2.79	2.64	2.49
4	5.20	5.04	4.92	4.76	4.56	4.40	4.16	4.00	3.84	3.76	3.52	3.32
6	7.80	7.56	7.38	7.14	6.84	6.60	6.24	6.00	5.76	5.64	5.28	4.98
10	13.20	12.70	12.50	12.00	11.50	11.10	10.60	10.00	9.60	9.30	8.90	8.40
16	21.12	20.48	20.00	19.20	18.40	17.76	16.96	16.00	15.36	14.88	14.24	13.44
20	26.40	25.60	25.00	24.00	23.00	22.20	21.20	20.00	19.20	18.60	17.80	16.8
25	33.00	32.00	31.25	30.00	28.75	27.75	26.50	25.00	24.00	23.25	22.25	21.00
32	42.56	41.28	40.00	38.72	37.12	35.52	33.92	32.00	30.72	29.76	28.16	26.88
40	53.20	51.20	50.00	48.00	46.40	44.80	42.40	40.00	38.40	37.20	35.60	33.6
50	67.00	65.50	63.00	60.50	58.00	56.00	53.00	50.00	48.00	46.50	44.00	41.50
63	83.79	81.90	80.01	76.86	73.71	70.56	66.78	63.00	60.48	58.90	55.44	52.29

When several simultaneously operating circuit breakers are mounted side by side in a small enclosure, the temperature rise inside the enclosure causes a reduction in current rating.
You must then assign the rating (already derated if necessary according to ambient temperatuer) a downrating factor of 0.8.

4. Overall and mounting dimensions (mm)