

## NB1 Miniature Circuit Breaker





## 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 (3-5I<sub>n</sub>)

protection for people and big length cables in TN and IT  
 systems.

C curve (5-10I<sub>n</sub>)

protection for resistive and inductive loads with low inrush  
 current.

D curve(10-14I<sub>n</sub>)

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.



**2. Ordering information**

2.1 IEC/EN 60898-1

**Icn=6000A, AC type**  
**(Icu=10kA IEC/EN 60947-2)**

★ NB1, 1P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	180	131001	971276	131053	971332	131105	971388
2	180	131002	971277	131054	971333	131106	971389
3	180	131003	971278	131055	971334	131107	971390
4	180	131004	971279	131056	971335	131108	971391
6	180	131005	971280	131057	971336	131109	971392
10	180	131006	971281	131058	971337	131110	971393
16	180	131007	971283	131059	971339	131111	971395
20	180	131008	971284	131060	971340	131112	971396
25	180	131009	971285	131061	971341	131113	971397
32	180	131010	971286	131062	971342	131114	971398
40	180	131011	971287	131063	971343	131115	971399
50	180	131012	971288	131064	971344	131116	971400
63	180	131013	971289	131065	971345	131117	971401

**Icn=6000A, AC type**

★ NB1, 1P+N



In (A)	CTN	Order Code			
		Curve B		Curve C	Curve D
		RoHS		RoHS	RoHS
1	90	984949	984963	984977	
2	90	984950	984964	984978	
3	90	984951	984965	984979	
4	90	984952	984966	984980	
6	90	984953	984967	984981	
10	90	984954	984968	984982	
16	90	984956	984970	984984	
20	90	984957	984971	984985	
25	90	984958	984972	984986	
32	90	984959	984973	984987	
40	90	984960	984974	984988	
50	90	984961	984975	984989	
63	90	984962	984976	984990	

**Icn=6000A, AC type**  
**(Icu=10kA IEC/EN 60947-2)**

★ NB1, 2P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	90	131014	971290	131066	971346	131118	971402
2	90	131015	971291	131067	971347	131119	971403
3	90	131016	971292	131068	971348	131120	971404
4	90	131017	971293	131069	971349	131121	971405
6	90	131018	971294	131070	971350	131122	971406
10	90	131019	971295	131071	971351	131123	971407
16	90	131020	971297	131072	971353	131124	971409
20	90	131021	971298	131073	971354	131125	971410
25	90	131022	971299	131074	971355	131126	971411
32	90	131023	971300	131075	971356	131127	971412
40	90	131024	971301	131076	971357	131128	971413
50	90	131025	971302	131077	971358	131129	971414
63	90	131026	971303	131078	971359	131130	971415

**Icn=6000A, AC type**  
**(Icu=10kA IEC/EN 60947-2)**

★ NB1, 3P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	60	131027	971304	131079	971360	131131	971416
2	60	131028	971305	131080	971361	131132	971417
3	60	131029	971306	131081	971362	131133	971418
4	60	131030	971307	131082	971363	131134	971419
6	60	131031	971308	131083	971364	131135	971420
10	60	131032	971309	131084	971365	131136	971421
16	60	131033	971311	131085	971367	131137	971423
20	60	131034	971312	131086	971368	131138	971424
25	60	131035	971313	131087	971369	131139	971425
32	60	131036	971314	131088	971370	131140	971426
40	60	131037	971315	131089	971371	131141	971427
50	60	131038	971316	131090	971372	131142	971428
63	60	131039	971317	131091	971373	131143	971429

Icn=6000A, AC type

★ NB1, 3P+N



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	45	984991		985005		985019	
2	45	984992		985006		985020	
3	45	984993		985007		985021	
4	45	984994		985008		985022	
6	45	984995		985009		985023	
10	45	984996		985010		985024	
16	45	984998		985012		985026	
20	45	984999		985013		985027	
25	45	985000		985014		985028	
32	45	985001		985015		985029	
40	45	985002		985016		985030	
50	45	985003		985017		985031	
63	45	985004		985018		985032	

Icn=6000A, AC type  
(Icu=10kA IEC/EN 60947-2)

★ NB1, 4P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	45	131040	971318	131092	971374	131144	971430
2	45	131041	971319	131093	971375	131145	971431
3	45	131042	971320	131094	971376	131146	971432
4	45	131043	971321	131095	971377	131147	971433
6	45	131044	971322	131096	971378	131148	971434
10	45	131045	971323	131097	971379	131149	971435
16	45	131046	971325	131098	971381	131150	971437
20	45	131047	971326	131099	971382	131151	971438
25	45	131048	971327	131100	971383	131152	971439
32	45	131049	971328	131101	971384	131153	971440
40	45	131050	971329	131102	971385	131154	971441
50	45	131051	971330	131103	971386	131155	971442
63	45	131052	971331	131104	971387	131156	971443

2.2 IEC/EN 60898-1

Icn=10000A, AC type

1~32A, Icu=15kA, IEC/EN 60947-2

40~63A, Icu=10kA, IEC/EN 60947-2

★ NB1, 1P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	180	131761	971780	131817	971836	131873	971892
2	180	131762	971781	131818	971837	131874	971893
3	180	131763	971782	131819	971838	131875	971894
4	180	131764	971783	131820	971839	131876	971895
6	180	131765	971784	131821	971840	131877	971896
10	180	131766	971785	131822	971841	131878	971897
16	180	131768	971787	131824	971843	131880	971899
20	180	131769	971788	131825	971844	131881	971900
25	180	131770	971789	131826	971845	131882	971901
32	180	131771	971790	131827	971846	131883	971902
40	180	131772	971791	131828	971847	131884	971903
50	180	131773	971792	131829	971848	131885	971904
63	180	131774	971793	131830	971849	131886	971905

Icn=10000A, AC type

★ NB1, 1P+N



In (A)	CTN	Order Code		
		Curve B		Curve D
		RoHS		RoHS
1	90	985033	985047	985061
2	90	985034	985048	985062
3	90	985035	985049	985063
4	90	985036	985050	985064
6	90	985037	985051	985065
10	90	985038	985052	985066
16	90	985040	985054	985068
20	90	985041	985055	985069
25	90	985042	985056	985070
32	90	985043	985057	985071
40	90	985044	985058	985072
50	90	985045	985059	985073
63	90	985046	985060	985074

Icn=10000A, AC type  
1~32A, Icu=15kA, IEC/EN 60947-2  
40~63A, Icu=10kA, IEC/EN 60947-2

★ NB1, 2P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	90	131775	971794	131831	971850	131887	971906
2	90	131776	971795	131832	971851	131888	971907
3	90	131777	971796	131833	971852	131889	971908
4	90	131778	971797	131834	971853	131890	971909
6	90	131779	971798	131835	971854	131891	971910
10	90	131780	971799	131836	971855	131892	971911
16	90	131782	971801	131838	971857	131894	971913
20	90	131783	971802	131839	971858	131895	971914
25	90	131784	971803	131840	971859	131896	971915
32	90	131785	971804	131841	971860	131897	971916
40	90	131786	971805	131842	971861	131898	971917
50	90	131787	971806	131843	971862	131899	971918
63	90	131788	971807	131844	971863	131900	971919

Icn=10000A, AC type  
1~32A, Icu=15kA, IEC/EN 60947-2  
40~63A, Icu=10kA, IEC/EN 60947-2

★ NB1, 3P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	60	131789	971808	131845	971864	131901	971920
2	60	131790	971809	131846	971865	131902	971921
3	60	131791	971810	131847	971866	131903	971922
4	60	131792	971811	131848	971867	131904	971923
6	60	131793	971812	131849	971868	131905	971924
10	60	131794	971813	131850	971869	131906	971925
16	60	131796	971815	131852	971871	131908	971927
20	60	131797	971816	131853	971872	131909	971928
25	60	131798	971817	131854	971873	131910	971929
32	60	131799	971818	131855	971874	131911	971930
40	60	131800	971819	131856	971875	131912	971931
50	60	131801	971820	131857	971876	131913	971932
63	60	131802	971821	131858	971877	131914	971933

Icn=10000A, AC type

★ NB1, 3P+N



In (A)	CTN	Order Code		
		Curve B	Curve C	Curve D
		RoHS	RoHS	RoHS
1	45	985075	985089	985103
2	45	985076	985090	985104
3	45	985077	985091	985105
4	45	985078	985092	985106
6	45	985079	985093	985107
10	45	985080	985094	985108
16	45	985082	985096	985110
20	45	985083	985097	985111
25	45	985084	985098	985112
32	45	985085	985099	985113
40	45	985086	985100	985114
50	45	985087	985101	985115
63	45	985088	985102	985116

Icn=10000A, AC type  
1~32A, Icu=15kA, IEC/EN 60947-2  
40~63A, Icu=10kA, IEC/EN 60947-2

★ NB1, 4P



In (A)	CTN	Order Code					
		Curve B		Curve C		Curve D	
		Standard	RoHS	Standard	RoHS	Standard	RoHS
1	45	131803	971822	131859	971878	131915	971934
2	45	131804	971823	131860	971879	131916	971935
3	45	131805	971824	131861	971880	131917	971936
4	45	131806	971825	131862	971881	131918	971937
6	45	131807	971826	131863	971882	131919	971938
10	45	131808	971827	131864	971883	131920	971939
16	45	131810	971829	131866	971885	131922	971941
20	45	131811	971830	131867	971886	131923	971942
25	45	131812	971831	131868	971887	131924	971943
32	45	131813	971832	131869	971888	131925	971944
40	45	131814	971833	131870	971889	131926	971945
50	45	131815	971834	131871	971890	131927	971946
63	45	131816	971835	131872	971891	131928	971947

2.3 IEC/EN 60947-2/ VC8036

Icu=6kA, AC type

★ NB1, 1P



In (A)	CTN	Order Code			
		10 In		12 In	
		Standard	RoHS	Standard	RoHS
1	180	139320	985379	190192	986592
2	180	139321	985380	190193	986593
3	180	139322	985381	190194	986594
4	180	139323	985382	190195	986595
6	180	139324	985383	190196	986596
10	180	139325	985384	190197	986597
16	180	139326	985385	190198	986598
20	180	139327	985386	190199	986599
25	180	139328	985387	190200	986600
32	180	139329	985388	190201	986601
40	180	139330	985389	190202	986602
50	180	139331	985390	190203	986603
63	180	139332	985391	190204	986604

Icu=6kA, AC type

★ NB1, 2P



In (A)	CTN	Order Code			
		10 In		12 In	
		Standard	RoHS	Standard	RoHS
1	90	139333	985392	986605	190205
2	90	139334	985393	986606	190206
3	90	139335	985394	986607	190207
4	90	139336	985395	986608	190208
6	90	139337	985396	986609	190209
10	90	139338	985397	986610	190210
16	90	139339	985398	986611	190211
20	90	139340	985399	986612	190212
25	90	139341	985400	986613	190213
32	90	139342	985401	986614	190214
40	90	139343	985402	986615	190215
50	90	139344	985403	986616	190216
63	90	139345	985404	986617	190217

Icu=6kA, AC type

★ NB1, 3P



In (A)	CTN	Order Code			
		10 In		12 In	
		Standard	RoHS	Standard	RoHS
1	60	139346	985405	190218	986618
2	60	139347	985406	190219	986619
3	60	139348	985407	190220	986620
4	60	139349	985408	190221	986621
6	60	139350	985409	190222	986622
10	60	139351	985410	190223	986623
16	60	139352	985411	190224	986624
20	60	139353	985412	190225	986625
25	60	139354	985413	190226	986626
32	60	139355	985414	190227	986627
40	60	139356	985415	190228	986628
50	60	139357	985416	190229	986629
63	60	139358	985417	190230	986630

Icu=6kA, AC type

★ NB1, 4P



In (A)	CTN	Order Code			
		10 In		12 In	
		Standard	RoHS	Standard	RoHS
1	45	139359	985418	190231	986631
2	45	139360	985419	190232	986632
3	45	139361	985420	190233	986633
4	45	139362	985421	190234	986634
6	45	139363	985422	190235	986635
10	45	139364	985423	190236	986636
16	45	139365	985424	190237	986637
20	45	139366	985425	190238	986638
25	45	139367	985426	190239	986639
32	45	139368	985427	190240	986640
40	45	139369	985428	190241	986641
50	45	139370	985429	190242	986642
63	45	139371	985430	190243	986643

2.4 UL1077  
Icn=5kA, AC type

★ NB1, 1P



In (A)	CTN	Order Code		
		Curve B RoHS	Curve C RoHS	Curve D RoHS
1	180	985223	985275	985327
2	180	985224	985276	985328
3	180	985225	985277	985329
4	180	985226	985278	985330
6	180	985227	985279	985331
10	180	985228	985280	985332
16	180	985229	985281	985333
20	180	985230	985282	985334
25	180	985231	985283	985335
32	180	985232	985284	985336
40	180	985233	985285	985337
50	180	985234	985286	985338
63	180	985235	985287	985339

Icn=5kA, AC type

★ NB1, 2P



In (A)	CTN	Order Code		
		Curve B RoHS	Curve C RoHS	Curve D RoHS
1	90	985236	985288	985340
2	90	985237	985289	985341
3	90	985238	985290	985342
4	90	985239	985291	985343
6	90	985240	985292	985344
10	90	985241	985293	985345
16	90	985242	985294	9853446
20	90	985243	985295	9853447
25	90	985244	985296	9853448
32	90	985245	985297	9853449
40	90	985246	985298	9853450
50	90	985247	985299	9853451
63	90	985248	985300	9853452

Icn=5kA, AC type

★ NB1, 3P



In (A)	CTN	Order Code		
		Curve B RoHS	Curve C RoHS	Curve D RoHS
1	60	985249	985301	985353
2	60	985250	985302	985354
3	60	985251	985303	985355
4	60	985252	985304	985356
6	60	985253	985305	985357
10	60	985254	985306	985358
16	60	985255	985307	985359
20	60	985256	985308	985360
25	60	985257	985309	985361
32	60	985258	985310	985362
40	60	985259	985311	985363
50	60	985260	985312	985364
63	60	985261	985313	985365

Icn=5kA, AC type

★ NB1, 4P



In (A)	CTN	Order Code		
		Curve B RoHS	Curve C RoHS	Curve D RoHS
1	45	985262	985314	985366
2	45	985263	985315	985367
3	45	985264	985316	985368
4	45	985265	985317	985369
6	45	985266	985318	985370
10	45	985267	985319	985371
16	45	985268	985320	985372
20	45	985269	985321	985373
25	45	985270	985322	985374
32	45	985271	985323	985375
40	45	985272	985324	985376
50	45	985273	985325	985377
63	45	985274	985326	985378

2.5 UL1077  
 Icn=10kA, DC type

★ NB1, 1P



Icn=10kA, DC type

★ NB1, 2P



A

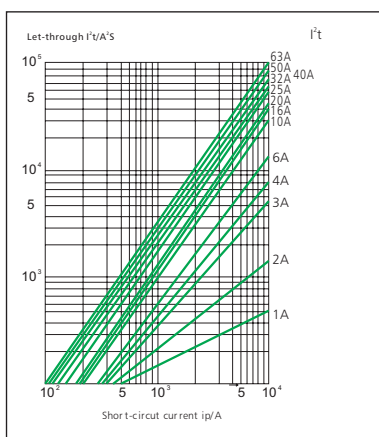
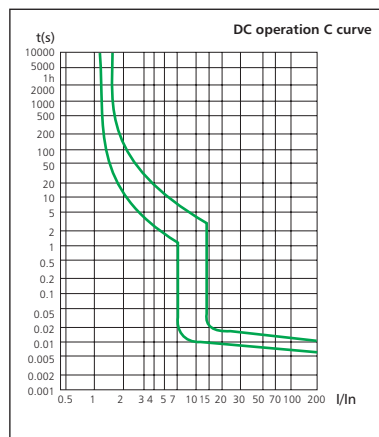
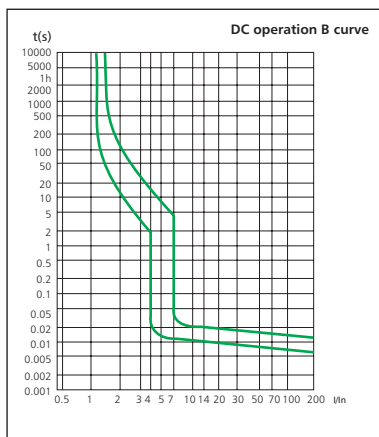
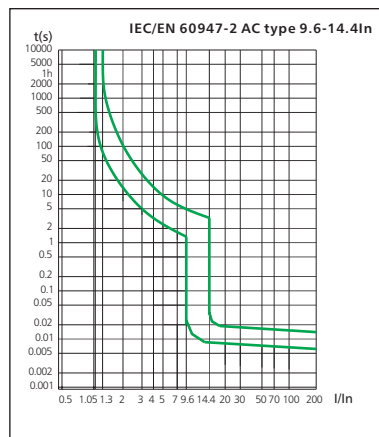
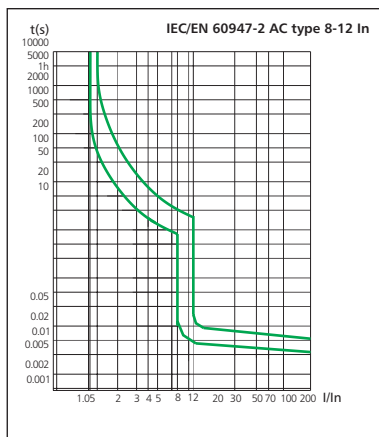
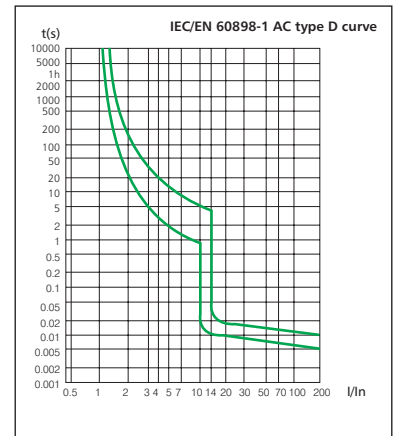
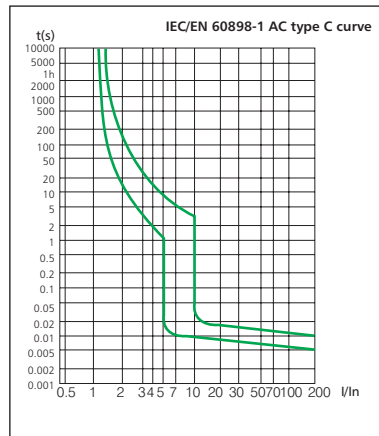
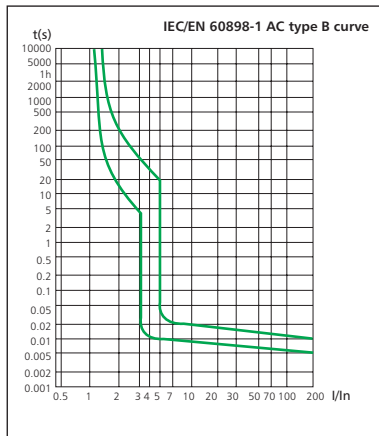
In (A)	CTN	Order Code	
		Curve B	Curve C
		RoHS	RoHS
1	180	985431	985457
2	180	985432	985458
3	180	985433	985459
4	180	985434	985460
6	180	985435	985461
10	180	985436	985462
16	180	985437	985463
20	180	985438	985464
25	180	985439	985465
32	180	985440	985466
40	180	985441	985467
50	180	985442	985468
63	180	985443	985469

In (A)	CTN	Order Code	
		Curve B	Curve C
		RoHS	RoHS
1	90	985444	985470
2	90	985445	985471
3	90	985446	985472
4	90	985447	985473
6	90	985448	985474
10	90	985449	985475
16	90	985450	985476
20	90	985451	985477
25	90	985452	985478
32	90	985453	985479
40	90	985454	985480
50	90	985455	985481
63	90	985456	985482



**3. Technical data**

3.1 curves



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	°C	30				
	Ambient temperature (with daily average ≤35°C)	°C	-5...+40(Special application please refer to P14 for temperature compensation correction)				
Storage temperature	°C	-25...+70					
Installation	Terminal connection type		Cable/U-type busbar/Pin-type busbar				
	Terminal size top/bottom for cable	mm <sup>2</sup>	25				
		AWG	18-4				
	Terminal size top/bottom for busbar	mm <sup>2</sup>	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 contact		Yes				



3.3 Selectivity

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

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

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	40	35	35
16	40	40	40	40	40	30	30
20	40	40	40	40	40	30	30
25	40	40	40	40	40	30	30
32	40	40	40	40	40	30	30
40	40	40	40	40	40	30	30
50	30	30	30	30	30	30	30
63	20	20	20	20	20	15	15

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

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°C**

Ambient temperature Rated current(A)	-35°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C
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 temperature) a downrating factor of 0.8.

4. Overall and mounting dimensions (mm)

