

Low voltage

C60 multi-standard range

Catalogue
07/2014



Presentation

Panorama of the C60 multi-standard range	CM907017E	2
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Circuit protection

Circuit breaker

C60 UL 489 circuit breaker	CM901037E	9
C60 UL 1077 circuit breaker	CM901039E	13

Direct current circuit breakers

C60H-DC	CM901044E	16
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Ground fault protection

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Panorama of the C60 multi-standard range

C60 UL 489

IEC 60947-2,
GB 14048-2,



Multi9 C60



See CM901037E.indd, page 9



OF



SD



MN



MX+OF



See CM907010E.indd, page 2

Circuit breakers

Auxiliaries

C60 UL 1077

IEC 60947-2,
GB 14048-2,



Multi9 C60



See CM901039E.indd, page 13



OF



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See CM907010E.indd, page 2

Circuit breakers

Auxiliaries



Rotary handle



Spacer



Padlocking device



Clip-on terminal marker strip

See CM907016E.indd, page 26

Accessories



Rotary handle



Plug-in base



Padlocking device



Screw shield



Terminal shield



Interpole barrier



Spacer



Connection kit for ring terminals



Multi-cable terminal



50 mm² Al terminal



Screw-on connection for ring terminal



Clip-on terminal marker strip

See CM907016E.indd, page 26

Accessories

Panorama of the C60 multi-standard range

GFP UL 1053

IEC 61008



GFP



See CM902013E.indd, page 21

Ground fault protector

C60H-DC

IEC 60947-2, GB 14048-2, UL1077



C60H-DC



See CM901044E.indd, page 16

Circuit breakers



OF



SD



MN



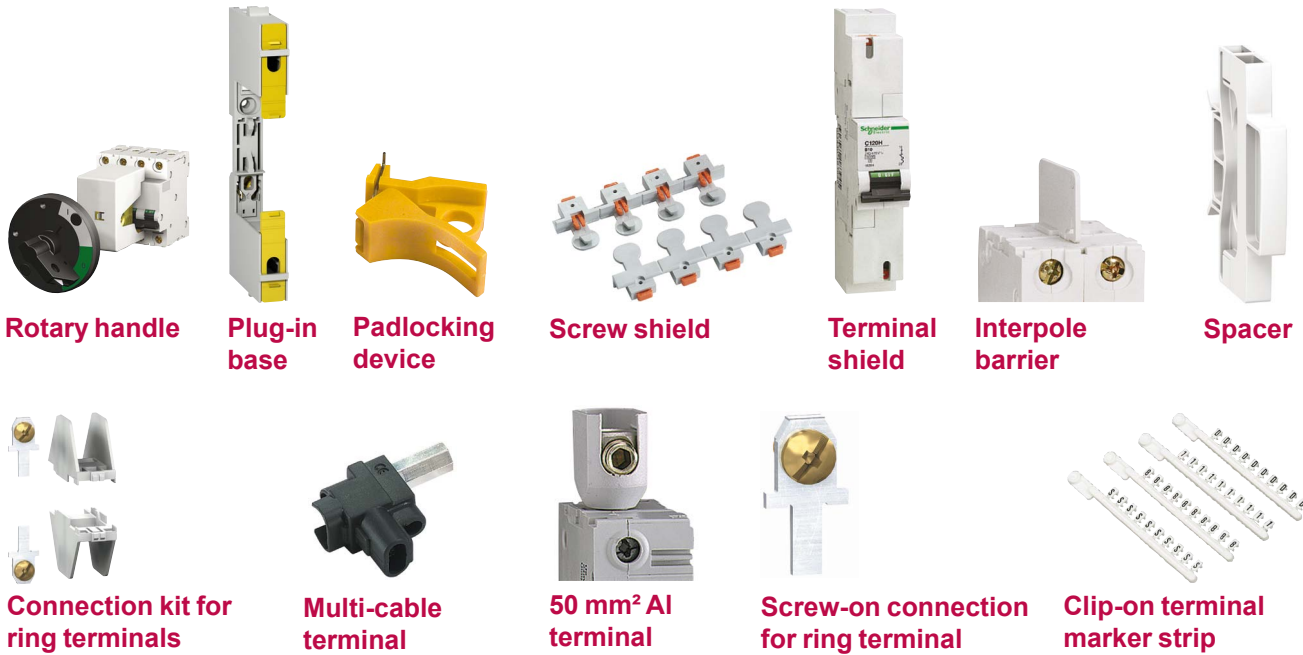
MX+OF



See CM907010E.indd, page 2

Auxiliaries

Panorama of the C60 multi-standard range



Rotary handle

Plug-in base

Padlocking device

Screw shield

Terminal shield

Interpole barrier

Spacer

Connection kit for ring terminals

Multi-cable terminal

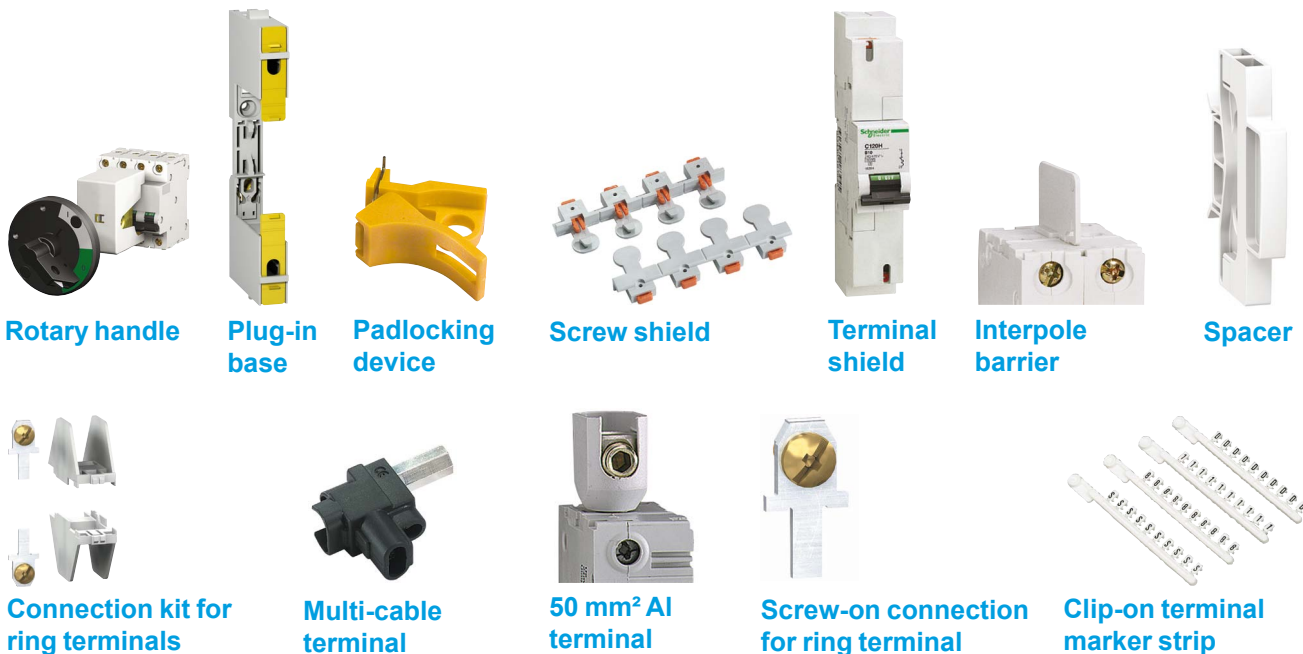
50 mm² Al terminal

Screw-on connection for ring terminal

Clip-on terminal marker strip

See CM907016E.indd, page 26

Accessories



Rotary handle

Plug-in base

Padlocking device

Screw shield

Terminal shield

Interpole barrier

Spacer

Connection kit for ring terminals

Multi-cable terminal

50 mm² Al terminal

Screw-on connection for ring terminal

Clip-on terminal marker strip

See CM907016E.indd, page 26

Accessories

Overview of the C60 multi-standard range



Multi 9 range for equipment having to comply with UL / CSA and IEC.

The Multi 9 system is designed for OEMs to ensure complete protection of their products or the specific circuits inside the equipment. This range allows OEMs throughout the world to offer equipment in compliance with the leading international standards:

- UL 489, UL 1077
- CSA C22.2 No. 5-02, CSA C22.2 No. 235-04
- IEC 60947-2
- GB 14048-2
- It saves space in the switchboard thanks to its small size
- Easy installation on symmetrical DIN rail (35 mm)
- It includes ratings that also make it possible to protect low-power circuits.

Main applications

- Semiconductor fabrication.
- Telecommunications.
- IT systems.
- Medical equipment.
- Transformers.
- Process control and automation.
- Packaging equipment.
- Food industry.



C60 UL 489



C60 UL 489 480Y/277 V~



C60 UL 1077



Tunnel terminal 240 V~



Tunnel terminal 480Y/277 V~



Ring terminal 240 V~



Ring terminal 480Y/277 V~

The setup of circuit protective devices depends on the electrical installation standard. Multi 9 devices (designed for machinery and equipment manufacturers, integrators, panelbuilders, etc.) are tested in accordance with the UL (Underwriter Laboratories) product standard in order to meet the requirements of the NEC (National Electric Code) installation standard, in force in the United States.

To allow the most extensive possible use worldwide, Multi 9 "UL" products are also tested to ensure compliance with IEC and CSA standards.

The CE Marking is an administrative formality for free circulation and sale on the territory of the European Union.

Made compulsory by a European directive, the CE Marking of products complies with the administrative and legal requirements. Designed for the European supervisory authorities (customs authorities), the "CE Marking" declarations and dossiers are produced under the sole responsibility of the manufacturer and undergo no conformity check by a third-party organization.

Only the quality marks, issued and inspected by an independent third-party organization, provide a full guarantee of operation, compatibility and safety in accordance with national and international standards.



UL 489

"Branch circuit protection" - Protection des départs/distribution

The UL 489 standard applies primarily to the protection of circuits installed, in accordance with the NEC (National Electric Code):

- upstream of a device or a machine (branch circuit protection)
- inside the device or a machine, for certain loads (ventilation, air conditioning, heating, etc.)
- to power loads external to the device (motors, power sockets, etc.).



UL 1077

Supplementary protection - Internal protection of electrical equipment

The UL 1077 standard applies to circuit breakers for electrical equipment, in accordance with the NEC. These circuit breakers are considered as components forming part of the equipment but can in no case replace a UL 489 protective device. Their use is limited to the protection of specific loads exclusively inside the machine or equipment. Where the machine or equipment is powered upstream by a control panel, the UL 1077 protection must be combined with a UL 489 protective device in that panel.



CSA C22.2 No. 5-02

The CSA (Canadian Standards Association) standard C22.2 No. 5-02 is very similar to the UL 489 standard. Products meeting this standard are designed for circuit protection in accordance with the CEC (Canadian Electrical Code).



CSA C22.2 No. 235-04

The CSA C22.2 No. 235-04 standard is equivalent to the UL 1077 standard.

UL 486A standard for wire connectors

The UL 486A standard applies to wire connectors in accordance with NEC recommendations. The Multi 9 C60 / C120 UL 489 and C60 UL 1077 circuit breakers are tested in accordance with this standard (UL 1077 does not require compliance with this standard).

It allows direct connection of wires to the circuit breakers without using an intermediate terminal block. The C60 / C120 Multi 9 UL range complies with the UL 486A standard which applies to copper wires.



CSA C22.2 No. 65

The CSA C22.2 No. 65 standard is equivalent to the UL 486A standard.



60947-2

The IEC 60947-2 standard is an international product standard concerning circuit breakers; it is used for industrial circuit protection applications. It meets the requirements of the IEC 60364 installation standard.

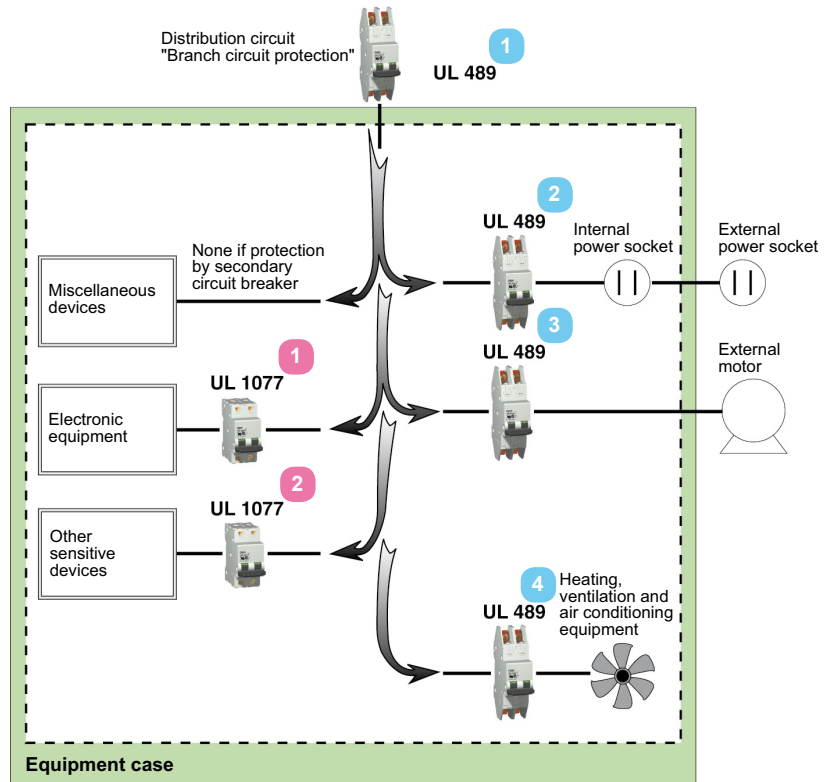


GB 14048-2

The GB 14048-2 standard is equivalent to the IEC 60947-2 standard for installations on Chinese territory.

The standards and their applications

Example of use of UL 489 circuit breakers and UL 1077 electrical equipment internal protective devices



UL 1077

Applications allowing the use of electrical equipment internal protective devices

UL 1077 (1)

Supplements an existing protective device or provides additional protection inside equipment

UL 1077 (2)

Used for the protection of internal circuits such as:

- Computers and microprocessors
- Telecommunications equipment
- Electronic controllers
- Power supply sources
- Transformers
- Small motors.

UL 489

Applications requiring branch circuit protection

UL 489

Equipment (1) coming end protection.

UL 489

Power socket (2) circuit protection (internal or external).

UL 489

Protection (3) an external circuit (e.g. motor).

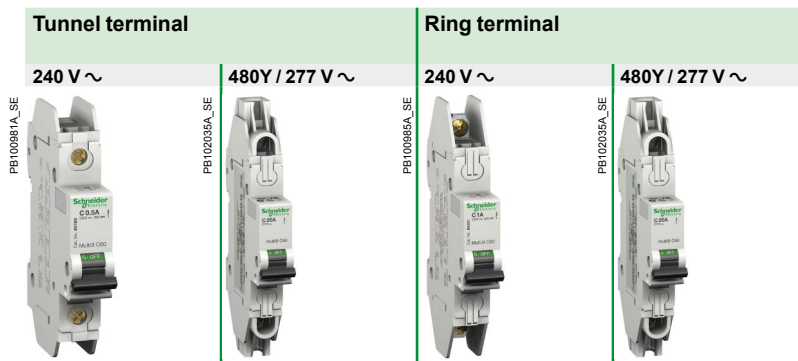
UL 489

Protection (4) heating, ventilation and air conditioning equipment (HACR/HVAC).

C60 UL 489 circuit breakers (C and D curves)



UL 489 / CSA C22.2 No. 5-02
IEC 60947-2 / GB 14048-2



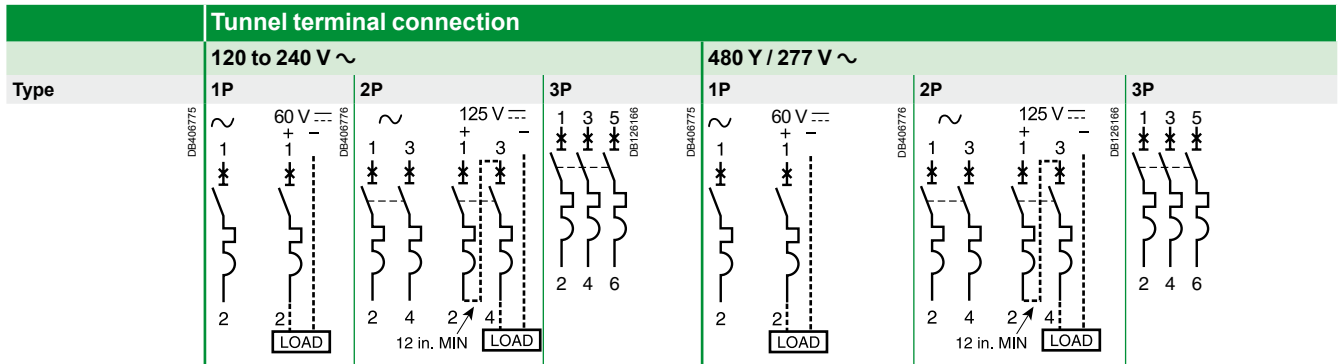
They provide:

- circuit overcurrent protection
- protection for wires against overloads and short circuits in final distribution
- manual control and isolation
- remote tripping, indications by the addition of auxiliaries.

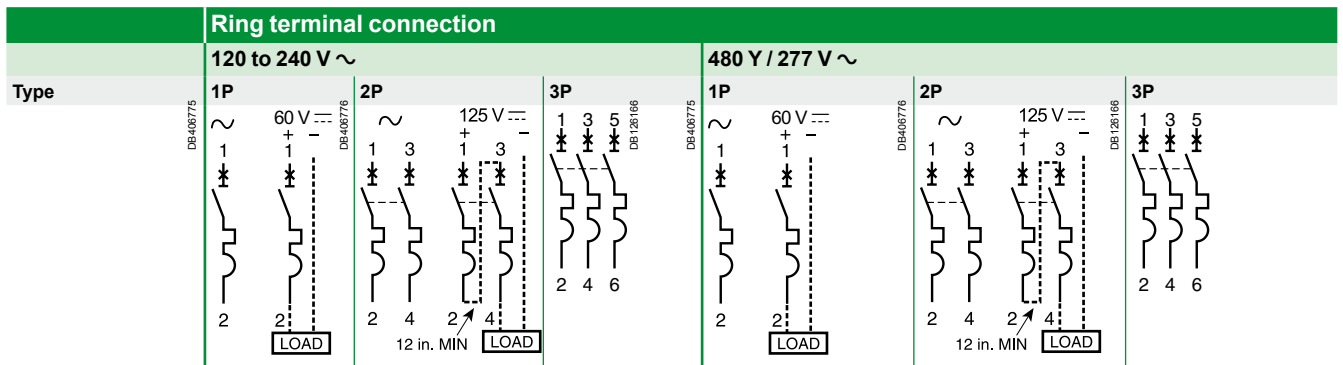
Breaking capacity:

Rating (A) 25 °C / 77°F	Number of 18 mm (0.71 in.) poles	Voltage	Breaking capacity (kA rms)	
			AIR UL 489/CSA	Icu IEC 60947-2
0.5 to 20	1P	277 V ~	10	10
	2P/3P	480Y/277 V ~	10	10
0.5 to 35	1P	120 V ~	10	-
		240 V ~	5	10
	2P/3P	240 V ~	10	20
		415 V ~	-	10
		440 V ~	-	6
	1P	60 V =	10	10
2P		125 V =	10	10

Catalogue numbers



Auxiliaries		Remote indication and tripping, module CM907010											
Rating (In)	Curve C		Curve D		Curve C		Curve D		Curve C		Curve D		
	C	D	C	D	C	D	C	D	C	D	C	D	
0.5	60100	60117	60134	60151	-	-	MGN61300	MGN61333	MGN61311	MGN61344	-	-	
1	60101	60118	60135	60152	60168	60184	MGN61301	MGN61334	MGN61312	MGN61345	MGN61323	MGN61356	
1.5	60102	60119	60136	60153	60169	60185	-	-	-	-	-	-	
2	60103	60120	60137	60154	60170	60186	MGN61302	MGN61335	MGN61313	MGN61346	MGN61324	MGN61357	
3	60104	60121	60138	60155	60171	60187	MGN61303	MGN61336	MGN61314	MGN61347	MGN61325	MGN61358	
4	60105	60122	60139	60156	60172	60188	MGN61304	MGN61337	MGN61315	MGN61348	MGN61326	MGN61359	
5	60106	60123	60140	60157	60173	60189	MGN61305	MGN61338	MGN61316	MGN61349	MGN61327	MGN61360	
6	60107	60124	60141	60158	60174	60190	MGN61306	MGN61339	MGN61317	MGN61350	MGN61328	MGN61361	
7	60108	60125	60142	60159	60175	60191	-	-	-	-	-	-	
8	60109	60126	60143	60160	60176	60192	MGN61307	MGN61340	MGN61318	MGN61351	MGN61329	MGN61362	
10	60110	60127	60144	60161	60177	60193	MGN61308	MGN61341	MGN61319	MGN61352	MGN61330	MGN61363	
13	60111	60128	60145	60162	60178	60194	-	-	-	-	-	-	
15	60112	60129	60146	60163	60179	60195	MGN61309	MGN61342	MGN61320	MGN61353	MGN61331	MGN61364	
20	60113	60130	60147	60164	60180	60196	MGN61310	MGN61343	MGN61321	MGN61354	MGN61332	MGN61365	
25	60114	60131	60148	60165	60181	60197	-	-	-	-	-	-	
30	60115	60132	60149	60166	60182	60198	-	-	-	-	-	-	
35	60116	60133	60150	60167	60183	60199	-	-	-	-	-	-	
Width in 9 mm modules	2		4		6		2		4		6		
Accessories	Module CM907016												



Auxiliaries		Remote indication and tripping, module CM907010											
Rating (In)	Curve C		Curve D		Curve C		Curve D		Curve C		Curve D		
	C	D	C	D	C	D	C	D	C	D	C	D	
0.5	60200	60217	60234	60251	-	-	MGN61366	MGN61399	MGN61377	MGN61410	-	-	
1	60201	60218	60235	60252	60268	60284	MGN61367	MGN61400	MGN61378	MGN61411	MGN61389	MGN61422	
1.5	60202	60219	60236	60253	60269	60285	-	-	-	-	-	-	
2	60203	60220	60237	60254	60270	60286	MGN61368	MGN61401	MGN61379	MGN61412	MGN61390	MGN61423	
3	60204	60221	60238	60255	60271	60287	MGN61369	MGN61402	MGN61380	MGN61413	MGN61391	MGN61424	
4	60205	60222	60239	60256	60272	60288	MGN61370	MGN61403	MGN61381	MGN61414	MGN61392	MGN61425	
5	60206	60223	60240	60257	60273	60289	MGN61371	MGN61404	MGN61382	MGN61415	MGN61393	MGN61426	
6	60207	60224	60241	60258	60274	60290	MGN61372	MGN61405	MGN61383	MGN61416	MGN61394	MGN61427	
7	60208	60225	60242	60259	60275	60291	-	-	-	-	-	-	
8	60209	60226	60243	60260	60276	60292	MGN61373	MGN61406	MGN61384	MGN61417	MGN61395	MGN61428	
10	60210	60227	60244	60261	60277	60293	MGN61374	MGN61407	MGN61385	MGN61418	MGN61396	MGN61429	
13	60211	60228	60245	60262	60278	60294	-	-	-	-	-	-	
15	60212	60229	60246	60263	60279	60295	MGN61375	MGN61408	MGN61386	MGN61419	MGN61397	MGN61430	
20	60213	60230	60247	60264	60280	60296	MGN61376	MGN61409	MGN61387	MGN61420	MGN61398	MGN61431	
25	60214	60231	60248	60265	60281	60297	-	-	-	-	-	-	
30	60215	60232	60249	60266	60282	60298	-	-	-	-	-	-	
35	60216	60233	60250	60267	60283	60299	-	-	-	-	-	-	
Width in 9 mm modules	2		4		6		2		4		6		
Accessories	Module CM907016												



Tunnel terminal 240 V ~



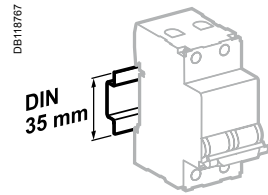
Tunnel terminal
480Y / 277 V ~



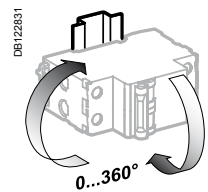
Ring terminal 240 V ~



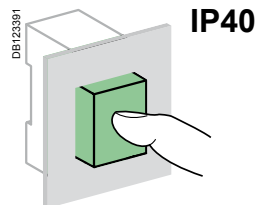
Ring terminal
480Y / 277 V ~



Clips on to 35 mm DIN rail.



Any installation position.



Connection

Type	Rating	Tightening torque	Cu wires	Screw-on connection for ring terminal
			DB1123945 (1)	DB1107810 (2)
Tunnel terminal 240 V ~	0.5 to 25 A	2.5 N.m (22 lb.in.)	2.5 to 25 mm ² (#14 #4 AWG)	-
	30-35 A	3.5 N.m (31 lb.in.)	2.5 to 35 mm ² (#14 #2 AWG)	-
Tunnel terminal 480 Y / 277 V	0.5 to 10 A	0.8 N.m (7 lb.in.)	1 or 2 wires, 1 to 1.5 mm ² (#18 #16 AWG)	-
	15 to 25 A	1.6 N.m (14 lb.in.)	1 or 2 wires, 2.5 to 6 mm ² (#14 #10 AWG)	-
Ring terminal 480 Y / 277 V 240 V ~	-	2 N.m (18 lb.in.)	-	Ø 5 mm

(1) UL 486A

(2) Single insulated ring terminal, UL or CSA certified.

Technical data

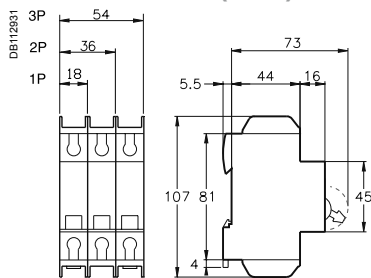
Main characteristics			
Voltage rating	120 to 240 V ~, 480 Y / 277 V ~, 60 V --- and 125 V ---		
Insulation voltage (U _i)	500 V		
Pollution degree	3		
Rated impulse withstand voltage (U _{imp})	6 kV		
Thermal tripping	Reference temperature	25°C	
Magnetic tripping (IEC 60947-2)	C curve	in alternating current	8.5 I _n ± 20 %
		in direct current	12 I _n ± 20 %
	D curve		12 I _n ± 20 %
Utilization category	-		
Limitation class	3		
Rated breaking and making capacity on a single pole (I _{cn1})	I _{cn1} = I _{cn}		
Additional characteristics			
Degree of protection (IEC 60529)	Device in modular enclosure	IP40 / IPXXB	
	Tunnel terminal connection 480 Y / 277 V ~	IP20 / IPXXB	
	Ring terminal connection	IP10 / IPXXA	
Endurance (O-C)	Electrical	10,000 cycles	
	Mechanical	20,000 cycles	
Operating temperature	-30°C to +70°C		
Storage temperature	-40°C to +80°C		
Tropicalization	Treatment 2 (relative humidity of 95 % at 55 °C)		

C60 UL 489 circuit breakers (C and D curves)

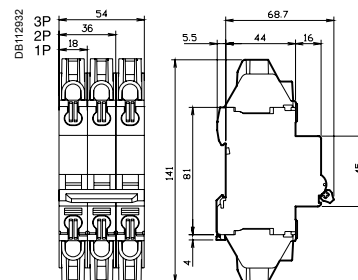
Weight (g/oz)

Circuit breaker	
Type	C60 UL
1P	110/3.88
2P	220/7.75
3P	330/11.64

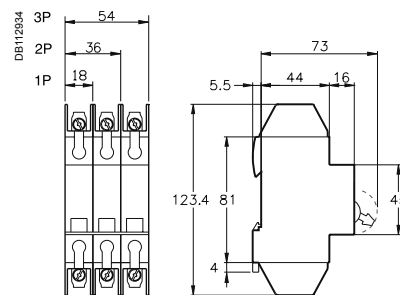
Dimensions (mm)



Tunnel terminal 240 V ~



Tunnel terminal 480Y / 277 V ~
Ring terminal 480Y / 277 V ~



Ring terminal 240 V ~



18360



18376

UL1077 / CSA C22.2, IEC 60947-2 / GB 14048-2

C60 UL circuit breakers are multi-standard circuit breakers which combine the following functions:

- circuit protection against short-circuit currents
- circuit protection against overload currents
- tripping and fault indication by the addition of auxiliaries.

Rating (A) 25°C/77°F	Number of 18 mm (0.71 in.) poles	Voltage	Breaking capacity (kA rms)	
			AIR UL 1077/CSA	Icu IEC 60947-2
0.5 to 63	1P	240 V ~	10	10
	2P/3P/4P	240 V ~	10	20
	1P	277 V ~	5	-
		415 V ~	-	3
		415 V ~	-	10
	2P/3P/4P	440 V ~	-	6
		480Y/277 V ~	5	-
	1P	60 V ≍	-	10
	1P	65 V ≍	10	-
	2P	125 V ≍	10	10

Catalogue numbers

C60 UL circuit breaker						
Type	1P			2P		
Auxiliaries	Remote indication and tripping, module CM907010					
Rating (In)	Curve			Curve		
	B	C	D	B	C	D
0.5	-	17411	17421	-	17441	17451
1	24110	24425	24500	24125	24442	24516
1.2	17402	17412	17422	17432	17442	17452
1.5	17403	17413	17423	17433	17443	17453
2	24111	24426	24501	24126	24443	24517
3	24112	24427	24502	24127	24444	24518
4	24113	24428	24503	24128	24445	24519
5	17404	17414	17424	17434	17444	17454
6	24114	24430	24504	24129	24447	24520
7	17405	17415	17425	17435	17445	17455
8	24115	24431	24505	24130	24448	24521
10	24116	24432	24506	24131	24449	24522
13	24117	24433	24507	24132	24450	24523
15	17406	17416	17426	17436	17446	17456
16	24118	24434	24508	24133	24451	24524
20	24119	24435	24509	24134	24452	24525
25	24120	24436	24510	24135	24453	24526
30	17407	17417	17427	17437	17447	17457
32	24121	24437	24511	24136	24454	24527
35	17408	17418	17428	17438	17448	17458
40	24122	24438	24512	24137	24455	24528
50	24123	24439	24513	24138	24456	24529
60	17409	17419	17429	17439	17449	17459
63	24124	24440	24514	24139	24457	24530
Width in 9 mm modules	2			4		
Accessories	Module CM907016					

Conformity with product standards

- UL 1077 additional protective devices, document #E90509.
- CSA C22.2 no. 235-04 additional protective devices, document #E179014.
- IEC 60947-2.

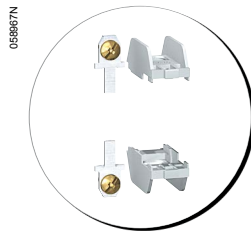
Catalogue numbers

C60 UL circuit breaker						
Type	3P			4P		
Auxiliaries	Remote indication and tripping, module CM907010					
	Curve			Curve		
Rating (In)	B	C	D	B	C	D
1	24140	24459	24532	24155	24476	24548
1.5	-	-	17470	-	-	-
2	24141	24460	24533	24156	24477	24549
3	24142	24461	24534	24157	24478	24550
4	24143	24462	24535	24158	24479	24551
6	24144	24464	24536	24159	24481	24552
8	24145	24465	24537	24160	24482	24553
10	24146	24466	24538	24161	24483	24554
13	24147	24467	24539	24162	24484	24555
15	17461	17466	17471	-	-	-
16	24148	24468	24540	24163	24485	24556
20	24149	24469	24541	24164	24486	24557
25	24150	24470	24542	24165	24487	24558
30	17462	17467	17472	-	-	-
32	24151	24471	24543	24166	24488	24559
35	17463	17468	17473	-	-	-
40	24152	24472	24544	24167	24489	24560
50	24153	24473	24545	24168	24490	24561
60	17464	17469	17474	-	-	-
63	24154	24474	24546	24169	24491	24562
Width in 9 mm modules	6			8		
Accessories	Module CM907016					

C60 UL 1077 circuit breakers (B, C and D curves)





PB10087A_SE-40



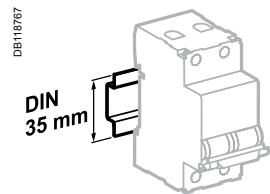
058687N

Connection kit for ring terminal cat. no. 17400 (option).

UL 486A connections for copper wires, document #E216919

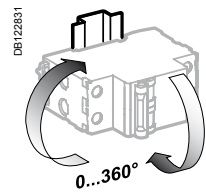
Rating	Tightening torque	Without accessory	With accessory
		Cu wires	Screw-on connection for ring terminal ⁽¹⁾
0.5 to 25 A	2.5 N.m (22 lb.in)	DB122845 	DB118789 
30 to 63 A	3.5 N.m (31 lb.in)	2.5 to 25 mm ² (#14 #4 AWG) 2.5 to 35 mm ² (#14 #2 AWG)	Ø 5 mm Ø 5 mm

(1) 2 set-screw connectors + 2 separators for terminals (upstream / downstream) cat. no. 17400.



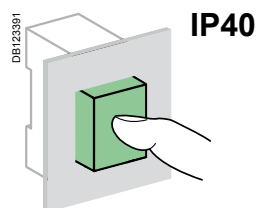
DB118767

Clips onto 35 mm DIN rail.



DB122831

Any installation position.



DB122391

IP40

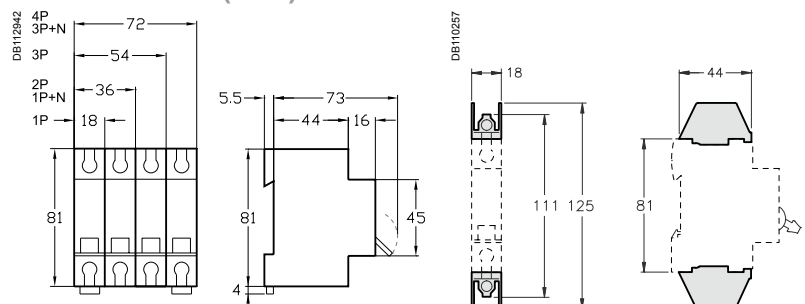
Technical data

Main characteristics			
Voltage rating	480Y/277 V ~, 60 V --- and 125 V ---		
Insulation voltage	500 V		
Pollution degree	3		
Rated impulse withstand voltage (Uimp)	6 kV		
Thermal tripping	Reference temperature	25°C	
Magnetic tripping	B curve	in alternating current	4 In ± 20 %
		in direct current	5.6 In ± 20 %
	C curve	in alternating current	8.5 In ± 20 %
		in direct current	12 In ± 20 %
D curve	in alternating current	12 In ± 20 %	
	Limitation class	3	
Rated breaking and making capacity on a single pole (Icn1)	Icn1 = Icn		
Additional characteristics			
Degree of protection (IEC 60529)	Device in modular enclosure	IP40	
	Tunnel terminal connection 480 Y / 277 V ~	IP20	
	Ring terminal connection	IP10	
Endurance (O-C)	Electrique	10,000 cycles	
	Mécanique	20,000 cycles	
Operating temperature	-30°C to +70°C		
Storage temperature	-40°C to +80°C		
Tropicalization	Treatment 2 (relative humidity 95 % at 55°C)		

Weight (g/oz)

Type	1P	2P	3P	4P
C60 UL	110/3.88	220/7.75	330/11.64	440/15.52

Dimensions (mm)



C60 UL 1077

Kit for ring terminals



IEC/EN 60947-2, GB 14048.2,
UL1077 (Supplementary Protector TC 3)



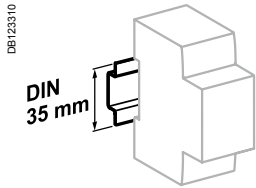
CE

The C60H-DC supplementary protectors are used in direct current circuits (Industrial control and automations, transport, renewable energy...). They combine the following functions of circuit protection against short-circuit and overload currents, control and isolation.

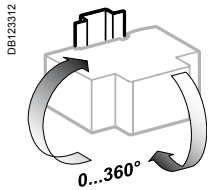
Catalogue numbers

C60H-DC			
Operating voltage (Ue)	12...250 V DC		12...500 V DC
Rated voltage (Un)	250 V DC		500 V DC
Number of poles	1P		2P
Curve	C		C
Number of modules of 9 mm	2		4
Diagrams	<p>Supply from above or below, observing the polarity</p>		<p>Supply from above or Supply from below</p>
Standards	UL1077	IEC 60947-2 EN 60947-2 GB 14048.2	UL1077 IEC 60947-2 EN 60947-2 GB 14048.2
Breaking capacity	5 kA / 250 V DC	20 kA / 110 V DC 10 kA / 220 V DC 6 kA / 250 V DC	5 kA / 500 V DC 20 kA / 220 V DC 10 kA / 440 V DC 6 kA / 500 V DC
Auxiliaries	Remote indication and tripping, module CM907010		
Rating (A)*	UL 1077, IEC 60947-2, EN 60947-2, GB 14048.2		
0.5	MGN61500	MGN61520	
1	MGN61501	MGN61521	
2	MGN61502	MGN61522	
3	MGN61503	MGN61523	
4	MGN61504	MGN61524	
5	MGN61505	MGN61525	
6	MGN61506	MGN61526	
10	MGN61508	MGN61528	
13	MGN61509	MGN61529	
15	MGN61510	MGN61530	
16	MGN61511	MGN61531	
20	MGN61512	MGN61532	
25	MGN61513	MGN61533	
30	MGN61514	MGN61534	
32	MGN61515	MGN61535	
40	MGN61517	MGN61537	
Rating (A)*	IEC 60947-2, EN 60947-2, GB 14048.2		
50	MGN61518	MGN61538	
63	MGN61519	MGN61539	
Accessories	Module CM907016		

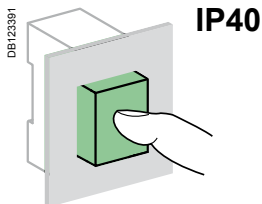
* At 25°C / 77°F see temperature derating.



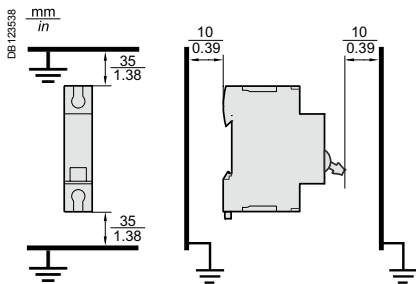
Clip on DIN rail 35 mm.



Indifferent position of installation.



IP40



Details of minimum distance between circuit-breaker and earthed metal parts for circuit-breaker intended for use without enclosure.

Technical data

- Tripping curves: C curve - Overcurrent protection for any type of application.
- Positive break indication - the green strip indicates that all the poles are open and allows work to be carried out on the downstream circuit in complete safety.
- Suitable for isolation as defined in IEC / EN 60947-2.
- Increase in the service life of the product: thanks to fast closure independent of the speed of action on the handle.
- Current limitation in the event of a fault: fast opening of the contacts prevents the loads from being destroyed in the event of a short-circuit.

Main characteristics

Rated service breaking capacity (Ics)	75 % of the ultimate breaking capacity (Icu)
Power loss	See module 92517
Magnetic tripping (Ii)	8.5 In (± 20 %) (compatible with curve C)
Rated impulse withstand voltage (Uimp) under frame	6 kV
Insulation voltage (Ui)	500 V DC

Endurance (O-C)

Electrical	3,000 cycles (where L/R=2 ms)
	6,000 cycles where the circuit is resistive
Mechanical	20,000 cycles

Additional characteristics

Pollution degree	3
Utilization category	A (no delay in accordance with IEC/EN 60947-2 standards)
Degree of protection (IEC 60529)	Device in modular enclosure IP40
Tropicalization (IEC 60068-2 and GB 14048.2)	Relative humidity: 95 % at 55°C / 131°F
Operating temperature	-25°C to 70°C / -13°F to 158°F
Storage temperature	-40°C to 85°C / -40°F to 185°F



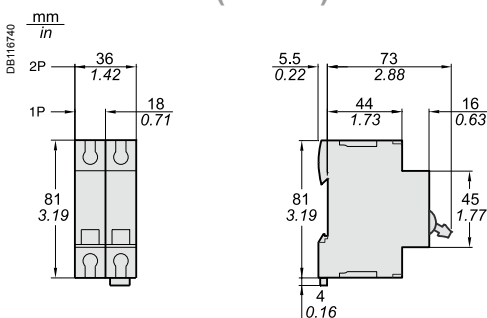
- Failure to match polarity during connection may lead to a fire hazard and/or serious injury.**
- The connection polarity must be observed (marked on the front panel).
 - Use only with direct current.
 - If two poles are used in series for the American network, use at least a 12 inch / 30 cm cable.

Weight (g)

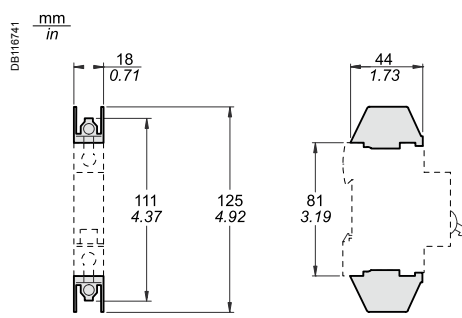
Circuit-breaker

Type	C60H-DC
1P	128 g / 4.51 oz
2P	256 g / 9.03 oz

Dimensions (mm/in)



C60H-DC



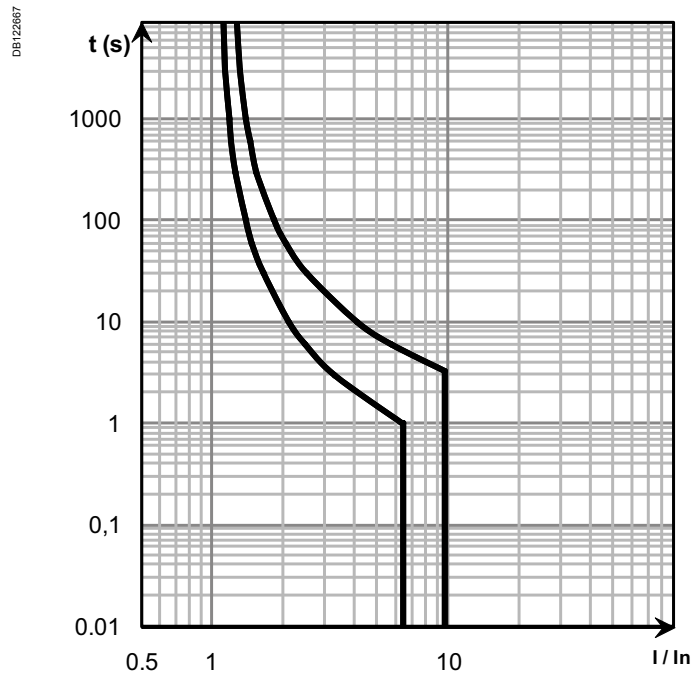
Kit for ring terminals

Curves

Tripping curves

C curve as in standard IEC 60947.2

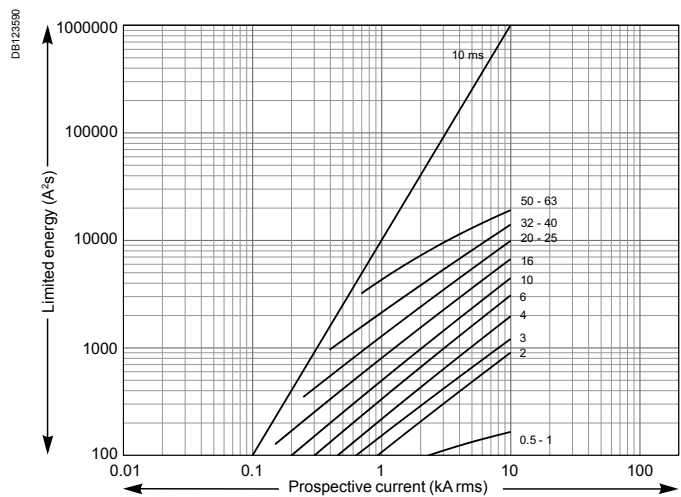
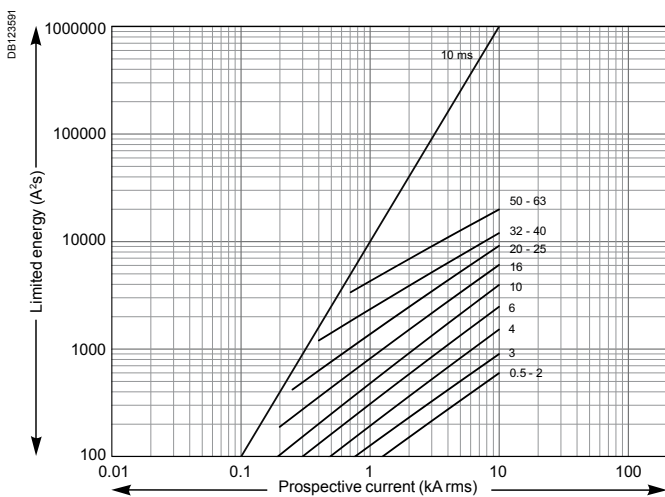
- The operating range of the magnetic release is as follows between 7 In and 10 In.
- The curves show the cold thermal tripping limits when poles are charged and the electromagnetic tripping limits with 2 charged poles.
- The curves are used without any derating.



Short circuit current limiting

220 V with 1P, 440 V with 2P

250 V with 1P, 500 V with 2P

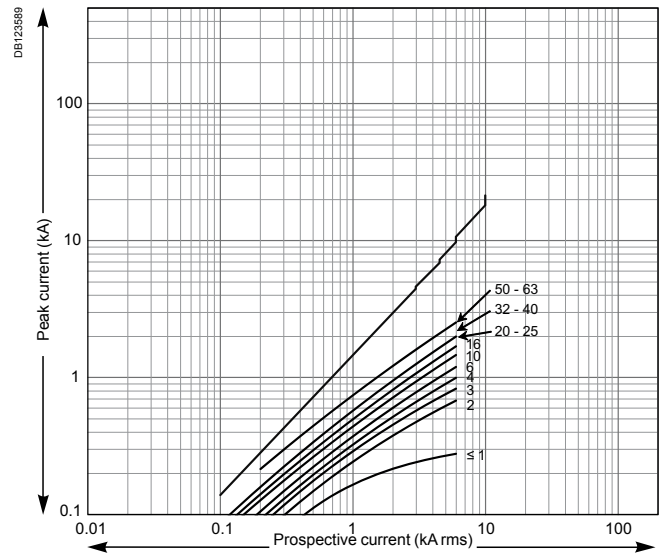
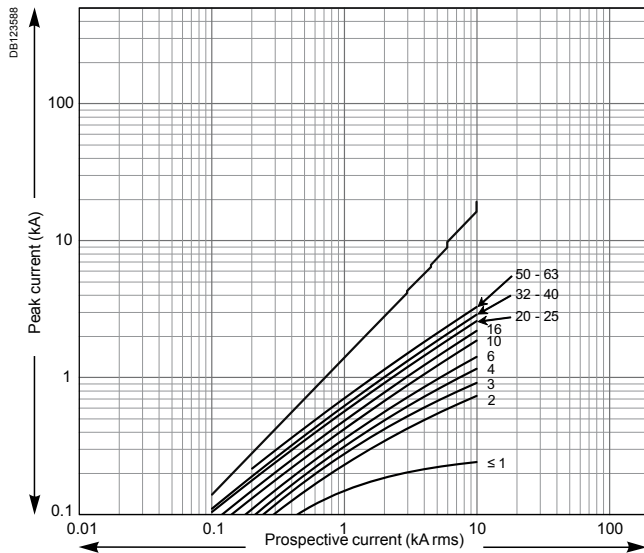


Curves (cont.)

Thermal stress limitation curve

220 V with 1P, 440 V with 2P

250 V with 1P, 500 V with 2P



Temperature derating (according to UL 1077/ CSA22.2/ UL489A/ UL489/ IEC 60947-2 standards)

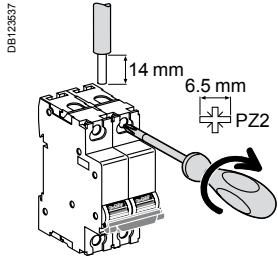
The maximum permissible current in a device depends on the ambient temperature in which it is placed. Ambient temperature is the temperature inside the enclosure or switchboard in which the devices have been installed.

The reference temperature is in the coloured column.

When several simultaneously operating devices are mounted side by side in a small enclosure, the temperature rise inside the enclosure causes a reduction in the current rating. A reduction coefficient of the order of 0.8 must therefore be allocated to the rating (already derated if it depends on the ambient temperature).

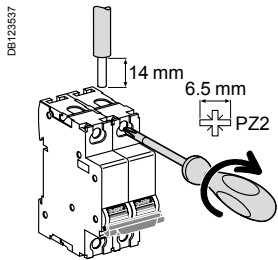
Temperature (°C)	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Ratings (A)																						
0.5	0.63	0.62	0.61	0.60	0.59	0.58	0.56	0.55	0.54	0.53	0.51	0.5	0.49	0.47	0.46	0.44	0.43	0.41	0.39	0.38	0.36	
1	1.18	1.17	1.15	1.14	1.12	1.10	1.09	1.07	1.05	1.04	1.02	1	0.98	0.96	0.94	0.92	0.90	0.88	0.86	0.84	0.82	
1.2	1.45	1.43	1.41	1.39	1.37	1.34	1.32	1.30	1.27	1.25	1.22	1.2	1.17	1.15	1.12	1.09	1.07	1.04	1.01	0.98	0.95	
1.5	1.86	1.83	1.80	1.77	1.74	1.71	1.67	1.64	1.61	1.57	1.54	1.5	1.46	1.42	1.39	1.34	1.30	1.26	1.22	1.17	1.12	
2	2.54	2.50	2.45	2.41	2.36	2.31	2.26	2.21	2.16	2.11	2.06	2	1.94	1.88	1.82	1.76	1.70	1.63	1.56	1.48	1.41	
3	3.78	3.71	3.65	3.58	3.51	3.45	3.38	3.30	3.23	3.16	3.08	3	2.92	2.84	2.75	2.66	2.57	2.48	2.38	2.27	2.17	
4	5.08	4.99	4.90	4.81	4.71	4.62	4.52	4.42	4.32	4.22	4.11	4	3.89	3.77	3.65	3.53	3.40	3.27	3.13	2.98	2.83	
5	6.00	5.92	5.83	5.74	5.66	5.57	5.48	5.39	5.29	5.20	5.10	5	4.90	4.80	4.69	4.58	4.47	4.36	4.24	4.12	4.00	
6	7.26	7.15	7.04	6.94	6.83	6.71	6.60	6.48	6.37	6.25	6.12	6	5.87	5.74	5.61	5.47	5.33	5.19	5.04	4.89	4.73	
7	8.76	8.62	8.47	8.32	8.17	8.01	7.85	7.69	7.52	7.35	7.18	7	6.82	6.63	6.44	6.24	6.03	5.82	5.60	5.37	5.13	
8	9.64	9.50	9.36	9.22	9.08	8.93	8.78	8.63	8.48	8.32	8.16	8	7.83	7.67	7.49	7.31	7.13	6.95	6.76	6.56	6.36	
10	12.59	12.38	12.16	11.94	11.71	11.49	11.25	11.01	10.77	10.52	10.26	10	9.73	9.45	9.17	8.87	8.57	8.25	7.92	7.58	7.22	
13	15.49	15.28	15.07	14.85	14.63	14.41	14.19	13.96	13.72	13.49	13.25	13	12.75	12.49	12.23	11.97	11.69	11.41	11.13	10.83	10.53	
15	18.61	18.31	18.01	17.70	17.38	17.06	16.74	16.40	16.07	15.72	15.36	15	14.63	14.25	13.85	13.45	13.03	12.60	12.16	11.69	11.21	
16	19.43	19.14	18.85	18.55	18.25	17.95	17.64	17.32	17.00	16.68	16.34	16	15.65	15.29	14.93	14.56	14.17	13.78	13.37	12.95	12.52	
20	24.06	23.72	23.37	23.02	22.67	22.31	21.94	21.56	21.18	20.80	20.40	20	19.59	19.17	18.74	18.30	17.85	17.39	16.92	16.43	15.93	
25	30.35	29.91	29.45	28.99	28.52	28.05	27.56	27.07	26.57	26.06	25.53	25	24.46	23.90	23.33	22.74	22.14	21.53	20.89	20.24	19.56	
30	37.35	36.74	36.12	35.50	34.86	34.21	33.54	32.86	32.17	31.46	30.74	30	29.24	28.46	27.66	26.83	25.98	25.10	24.19	23.24	22.25	
32	38.45	37.91	37.36	36.80	36.24	35.66	35.08	34.48	33.88	33.27	32.64	32	31.35	30.68	30.00	29.31	28.59	27.86	27.11	26.34	25.54	
35	44.15	43.40	42.63	41.86	41.06	40.25	39.42	38.58	37.72	36.83	35.93	35	34.05	33.06	32.05	31.01	29.93	28.81	27.64	26.42	25.14	
40	48.92	48.17	47.42	46.65	45.87	45.08	44.28	43.45	42.62	41.76	40.89	40	39.09	38.16	37.20	36.22	35.21	34.17	33.10	31.99	30.84	
50	59.93	59.09	58.25	57.39	56.52	55.63	54.74	53.82	52.89	51.95	50.98	50	49.00	47.97	46.93	45.86	44.77	43.64	42.49	41.31	40.09	
60	76.16	74.83	73.48	72.11	70.71	69.28	67.82	66.33	64.81	63.25	61.64	60	58.31	56.57	54.77	52.92	50.99	48.99	46.90	44.72	42.43	
63	78.16	76.91	75.63	74.33	73.01	71.67	70.30	68.90	67.47	66.02	64.53	63	61.44	59.83	58.18	56.49	54.74	52.93	51.06	49.12	47.10	

Connection



Rating	Tightening torque	Without accessory		With accessories			
		Copper cables		50 mm ² Al terminal	Screw-on connection for ring terminal	Multi-cables terminal	
		Rigid / Stranded	Flexible or with ferrule		Rigid cables	Flexible cables	
≤ 25 A	2.5 N.m / 22 lb.in	DB122945 	DB122946 	DB122935 	DB118789 	DB118787 	
> 25 A	3.5 N.m / 31 lb.in	1 to 25 mm ² #18 - #4 AWG	1 to 16 mm ² #18 - #6 AWG	50 mm ² 1 AWG	∅ 5 mm	3 x 16 mm ² 3 x 6 AWG	3 x 10 mm ² 3 x 8 AWG
		1 to 35 mm ² #18 - #2 AWG	1 to 25 mm ² #18 - #4 AWG	-			

Multi-cables connection



Rating	Tightening torque	Without accessory			
		2 Copper cables		3 Multi-cables / Different wires	
		Rigid / Stranded	Flexible or with ferrule	Flexible / Stranded	Flexible / Stranded / Rigid
≤ 25 A	2.5 N.m / 22 lb.in	DB122945 	DB122946 	DB118787 	
> 25 A	3.5 N.m / 31 lb.in	2 x 1 mm ² to 2 x 10 mm ² 2 x 18 AWG - 2 x 8 AWG		3 x 1 mm ² 3 x 18 AWG	2 x 2.5 mm ² + 1 x 1.5 mm ² 2 x 13 AWG + 1 x 15 AWG
		2 x 1 mm ² to 2 x 16 mm ² 2 x 18 AWG - 2 x 6 AWG		3 x 4 mm ² 3 x 6 AWG	2 x 10 mm ² + 1 x 6 mm ² 2 x 8 AWG + 1 x 9 AWG



UL 1053 residual current circuit breakers already protected upstream by a short-circuit and overload protection device are used for:

- control and disconnection of electric circuits
- protection of people against electric shock by direct and indirect contacts
- protection of installations against insulation faults.

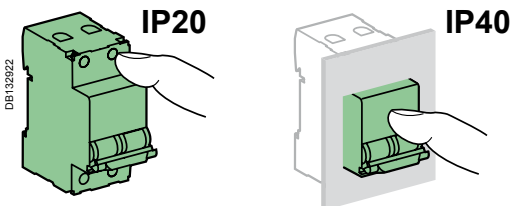
They comply with RCD standards UL 1053 and IEC 61008.

- Voltage Independent: electromechanical technology, ensure residual current protection down to 0 V.

They guarantee:

- enhanced continuity of supply, during a series of close lightning strokes, IT earthing system, equipment including interference suppression filters, variable speed controllers, frequency converters, electronic ballasts for lighting
- enhanced earth leakage protection: in presence of harmonics or high frequency rejections.

SI type GFPs are ideal for operation in environments with a humid atmosphere and/or polluted by aggressive agents: swimming pools, marinas, agri-food industries, water treatment stations, industrial sites, etc.



Weight (g/oz)

GFP UL 1053 type AC <i>SI</i>	
Type	GFP
2P	220 / 7.7
4P	450 / 15.9

IEC/EN 61008-1

IEC/EN 61008-2-1: Voltage Independent
UL 1053

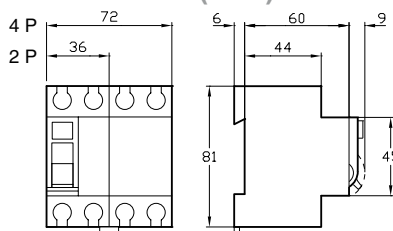
GFP UL 1053 type AC *SI*

Technical data		
Voltage rating +10 %, -15 %	2P	120 or 240 V ~ 60 Hz 230 or 240 V ~ 50 Hz
	2P	480Y/277 V ~ 60 Hz 240 V ~ 60 Hz 230/400 or 240/415 V ~ 50 Hz
	4P	480Y/277 V ~ 60 Hz 240 V ~ 60 Hz 230/400 or 240/415 V ~ 50 Hz
Current rating (In) at 40°C	25...100 A	
Making and breaking capacity: rated residual current (IΔm)	1 000 A	
Rated impulse withstand voltage (Uimp)	6 kV	
Utilisation category	AC 23A	
Level of immunity	In current wave 8/20 μs: 3 kA	
	In dampened recurrent current wave 0.5 μs/100 kHz: 200 A	
Short-circuit current withstand (IΔc = Inc)	10 kA with 100 A gG upstream fuse	
Test button minimum operating voltage	2P	113 V AC
	4P	189 V AC
Phase-to-phase test circuit	To avoid external bridging on use on three-phase network without neutral	
Locking possible in "tripped" position	By padlocking facility (not supplied)	
Release with fixed sensitivity for all ratings	Instantaneous release:	
	UL 1053 : ±15 %	
	IEC 61008 : +0 %, -50 %	
Behaviour in case of voltage drop	Ensure residual current protection down to 0 V	
Earth fault indication	On front face by red mechanical indicator	
Number of cycles (O-C)	20,000 cycles	
Tropicalisation	Treatment 2 (relative humidity: 95 % at 55°C)	
Degree of protection as per IEC 60529	On front face: IP40/IPXXB	
	Tunnel terminal connection: IP20/IPXXB	
Operating temperature	-25°C to +60°C	
Storage temperature	-40°C to +70°C	

UL 486A connections for copper wires, document #E216919

Rating	Tightening torque	Cu wires
25 to 100 A	3.5 N.m (31 lb.in)	 2.5 to 35 mm ² (#14 #2 AWG)

Dimensions (mm)





GFP - Ground Fault Protector

UL 1053

IEC 61008

Catalogue numbers

GFP UL 1053 type AC S/							
AC type S/	Rating (A)	Sensitivity (mA)		Cat. no.		Width in mod. of 9 mm (0,354 in.)	
		UL 1053	IEC 61008	120 or 240 V 230 or 240 V	240 V 480Y/277 V 230/400 or 240/415 V		
2P							
	25	26	30	60949	60969	4	
		86	100	60950	60971		
		260	300	60951	-		
	40	26	30	60952	60972		
		260	300	60954	-		
		63	26	30	60955		-
AC type S/							
AC type S/	Rating (A)	Sensitivity (mA)		Cat. no.		Width in mod. of 9 mm (0,354 in.)	
		UL 1053	IEC 61008	240 V 480Y/277 V 230/400 or 240/415 V			
4P							
	25	26	30	-	60989	8	
		86	100	-	60990		
		260	300	-	60991		
	40	26	30	-	60992		
		260	300	-	60994		
		63	26	30	-		60995
	100	86	100	-	60996		
		86	100	-	60999		
		Accessories					
				Module CM907016			



Coordination

Short-Circuit Current Rating (SCCR)

The Ground-Fault Protector GFP must be used with upstream overcurrent protection suitable for the circuit. GFP is suitable for use on a circuit capable of delivering not more than values (kA) below when protected by devices listed below.

Overcurrent Protection Required for UL applications of GFP

GFP	Circuit breaker type									
	C60 240 V		C60 277 V	C60 480Y/277 V		QOU		QO		HDL
	1P and 2P	3P	1P	2P	3P	1P and 2P	3P	1P and 2P	3P	2P
2P 240 V ~ ⁽¹⁾	25 A	25 A	20 A	20 A	20 A	25 to 70 A	25 to 100 A	25 to 70 A	25 to 100 A	25 to 50 A
2P 240 V ~ ⁽¹⁾	10	-	-	-	-	10	-	10	-	65
2P 480Y/277 V ~ ⁽¹⁾	-	-	10	10	-	-	-	-	-	-
4P 480Y/277 V ~ ⁽¹⁾	-	10	-	-	10	-	10	-	10	-

⁽¹⁾ include all amperages of GFP

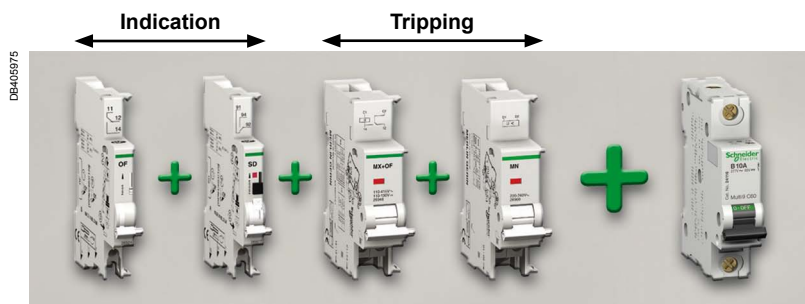
10 Max short-Circuit Current withstand (kA)



Compliance with electrical auxiliaries standards

- For UL 489 circuit breaker File #217688.
- For CSA C22.2 No. 5.2 circuit breakers File #179014.
- For UL 1077 Supplementary Protectors File #E90509.
- For CSA C22.2 No. 235-M04 Supplementary Protectors File #179014.
- For IEC 60947-2 and IEC 60947-5-1 circuit-breakers.
- CE Marked.

- The electrical auxiliaries are combined with C60 UL circuit breakers.
- They perform the functions of tripping or remote indication of the position (open/closed/tripped) of circuit breakers in the event of a fault.
- They are installed by clip-on mounting (without tools) to the left of the circuit breaker.



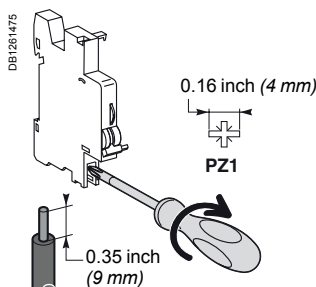
Combination table

Electrical auxiliaries	Electrical auxiliaries	Electrical auxiliaries	Devices
<p>3</p>	<p>2</p>	<p>1</p>	<p>C60 UL</p>
1 OF	1 SD or OF	2 (MN, MX+OF) maxi	





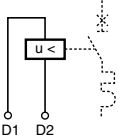
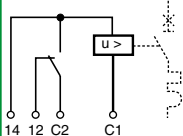
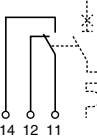
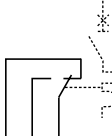


Tripping devices must be installed first.

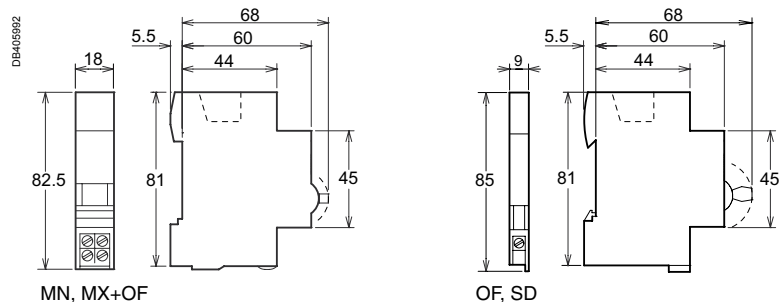
Connection






Type	Tightening torque	Copper wires
Indication and tripping auxiliaries	9 lb.in (1 N.m)	Rigid
		DB405990 2 wires, #16 AWG (1.5 mm ²) or 1 wires, #14 AWG (2.5 mm ²)




	Tripping				Indication					
Auxiliaries Type	MN Undervoltage release		MX+OF Shunt release		OF Open/closed auxiliary contact		SD Fault indicating switch			
	Instantaneous		With open/closed auxiliary contact							
										
Function	<ul style="list-style-type: none"> Causes tripping of the device with which it is combined when its input voltage decreases (between 70 % and 35 % of U_n) Prevents closing of the device until its input voltage has been restored 		<ul style="list-style-type: none"> Causes tripping of the associated device when powered Includes an open/closed contact (OF) to indicate the "open" or "closed" position of the associated device 		<ul style="list-style-type: none"> Changeover contact indicating the "open" or "closed" position of the associated device 		<ul style="list-style-type: none"> Changeover contact indicating the position of the associated device in the event of: <ul style="list-style-type: none"> an electrical fault actuation of the tripping auxiliary Same indication function as VISI-TRIP 			
Wiring diagrams										
Use	<ul style="list-style-type: none"> Emergency stoppage by normally closed push button Ensures the safety of power supply circuits for several machines by preventing untimely restarting 		<ul style="list-style-type: none"> Emergency stoppage by normally open push button Remote indication of the position of the associated device 		<ul style="list-style-type: none"> Remote indication of the position of the associated device 		<ul style="list-style-type: none"> Remote indication of tripping upon a fault in the associated device 			
Catalogue numbers	27105	27106	27107	27108	27109	27110	27118	26925	26928	
Technical specifications										
Rated voltage (Ue)	V AC, 50/60 Hz	220...240	48	120	24	120...277	48	12...24	220...240	220...240
	V DC	-	48	-	24	110...125	48	12...24	12...130	12...130
Mechanical status indicator, red	On front panel			On front panel	On front panel			-	On front panel	
Test function	-			-	-			On front panel	On front panel	
Width in 9 mm modules	2			2	2			1	1	
Current rating	-			-	3 A / 415 V AC 6 A / ≤ 240 V AC			3 A / 415 V AC 6 A / ≤ 240 V AC		
Number of contacts	-			-	1 NO/NC			1 NO/NC		
Operating temperature	°C	-25...+50		-25...+50	-25...+50			-25...+50		-25...+50
Storage temperature	°C	-40...+85		-40...+85	-40...+85			-40...+85		-40...+85

Dimensions









Installation							
Accessories	Rotary handle			Plug-in base	Padlocking device		
PB100137_SE-24 PB100138_SE-24				PB111764-40 	067209U_SE-20 		
Function							
	Front or side control of 2, 3 and 4-pole circuit breakers or GFP <ul style="list-style-type: none"> ■ Degree of protection: IP40 ■ A complete rotary handle consists of: <ul style="list-style-type: none"> □ a circuit-breaker operating sub-assembly, cat. no. 27046, □ a handle cat. no. 27047 or a handle cat. no. 27048 ■ Installation: <ul style="list-style-type: none"> □ the circuit-breaker operating sub-assembly cat. no. 27046 is fixed to the circuit breaker or to the GFP □ the removable handle cat. no. 27047 is mounted on the removable front panel or on the enclosure door □ the fixed handle cat. no. 27048 is fixed to the front or side panel of the enclosure 			Allows a circuit breaker to be quickly removed or replaced, without touching the connections <ul style="list-style-type: none"> ■ Degree of protection: IP20 ■ It consists of: <ul style="list-style-type: none"> □ a base to be fixed to a rail (or panel) □ 2 "blades" to be fixed in the device terminals ■ Connection: tunnel terminals for cables up to 50 mm² (rigid) or 35 mm² (flexible) ■ Installation: <ul style="list-style-type: none"> □ on backplate □ on a horizontal rail ■ Centreline between two rows: 200 mm ■ Only on the circuit breaker, without a Vigi device or auxiliary ■ Padlocking option (8 mm dia. padlock not supplied) 		Used to padlock a device in the "open" or "closed" position <ul style="list-style-type: none"> ■ Diameter of the padlock: 8 mm max. ■ Locking in the ON position does not prevent the device from tripping in the event of a fault ■ Isolation: in conformity with IEC/EN 60947-2. 	
Cat. numbers	27047 Removable extended handle	27048 Fixed handle	27046 Operating sub-assembly	26996 (1 per pole)	26970		
Set of	1	1	1	1	2		
Suitable for the following devices:							
C60 UL489	■ 2P, 3P			–	■		
C60 UL1077	■			■	■		
GFP UL1053	■ 2P, 4P			■	■		
C60H-DC	■ 2P			■	■		

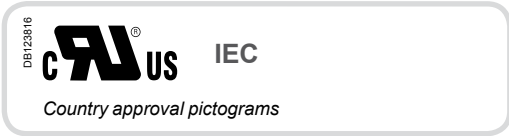
Accessories for C60 UL489, C60 UL1077, GFP UL1053, C60H-DC, devices (cont.)

Safety					
Accessories	Screw shield	Terminal shield		Interpole barrier	Spacer
PB124114		0568869_SE-38		DB123898	
Function	<p>Prevents all contact with the fixing screws</p> <ul style="list-style-type: none"> ■ The degree of protection becomes IP40 ■ Sealable, max. diameter 1.2 mm ■ Dividable 	<p>Prevents all contact with the terminals</p> <ul style="list-style-type: none"> ■ Degree of protection becomes IP40 ■ Sealable, max. diameter 1.2 mm <ul style="list-style-type: none"> ■ 1P ■ 2P <ul style="list-style-type: none"> ■ 3P: 1 x 26975 + 1 x 26976 ■ 4P: 2 x 26976 		<p>Improves the insulation between the connections: cables, terminals, lugs, etc.</p>	<ul style="list-style-type: none"> ■ Used to: <ul style="list-style-type: none"> <input type="checkbox"/> complete the rows <input type="checkbox"/> separate the devices ■ Width: 1 x 9 mm module ■ Allows that 2 cables are routed from one row to another (above and below), up to 6 mm²
Cat. numbers	26981	26975	26976	27001	27062
Set of	2 (4P dividable)	2 (for upstream/downstream terminal)		10	1
Suitable for the following devices:					
C60 UL489	–	–	–	–	■
C60 UL1077	■	■	■	■	■
GFP UL1053	■	–	■	■	■
C60H-DC	■	■	■	■ 2P	■

Accessories for C60 UL489, C60 UL1077, GFP UL1053, C60H-DC, devices (cont.)

Accessories	Connection				
	Multi-cable terminal	50 mm ² Al terminal	Screw-on connection for ring terminal	Connection kit for ring terminals	
DB118780 	DB112822 	DB112887 	058897N-23 		
Function	For 3 copper cables: ■ Rigid up to 16 mm ² ■ Flexible up to 10 mm ²	For 16 to 50 mm² aluminium cables Al	For lug tipped cables, front or rear mounting  Ø 5 mm	For terminal up to 63 A, front or rear access (screw Ø 5 mm) ■ It incorporates a "conductive" part and an "insulating" part which ensures the phase-to-phase clearance	
Cat. numbers	19091	19096	27060	27053	17400
Set of	4	3	1	8	2
C60 UL489	—	—	—	—	—
C60 UL1077	■	■	■	■	■
GFP UL1053	■	■	■	■	■
C60H-DC	■	■	■	■	■
Tightening torque	2 N.m	—	10 N.m	2 N.m	—
Stripping length	11 mm	—	13 mm	—	—
Tools to be used	Diameter 5 mm or PZ2	—	Hc 1/5" or 5 mm	Diameter 5 mm	Diameter 5 mm

Accessories	Identification			
	Clip-on terminal marker strip			
031294D_SE-23 	Function	For connection identification		
Cat. numbers	0: AB1-R0 1: AB1-R1 2: AB1-R2 3: AB1-R3 4: AB1-R4 5: AB1-R5 6: AB1-R6 7: AB1-R7 8: AB1-R8 9: AB1-R9	A: AB1-GA B: AB1-GB C: AB1-GC D: AB1-GD E: AB1-GE F: AB1-GF G: AB1-GG H: AB1-GH I: AB1-GI J: AB1-GJ	K: AB1-GK L: AB1-GL M: AB1-GM N: AB1-GN O: AB1-GO P: AB1-GP Q: AB1-GQ R: AB1-GR S: AB1-GS T: AB1-GT	U: AB1-GU V: AB1-GV W: AB1-GW X: AB1-GX Y: AB1-GY Z: AB1-GZ +: AB1-R12 -: AB1-R13 Blank : AB1-RV
Set of	250			
C60 UL489	■ 4 markers max. per pole			
C60 UL1077	■ 4 markers max. per pole			
GFP UL1053	■ 4 markers max. per pole			
C60H-DC	■ 4 markers max. per pole			



The comb busbars are used only for C60 circuit-breakers in conformity with standards UL 489, CSA C22.2 No. 5-02 or IEC 60947-2 fitted with tunnel terminals.

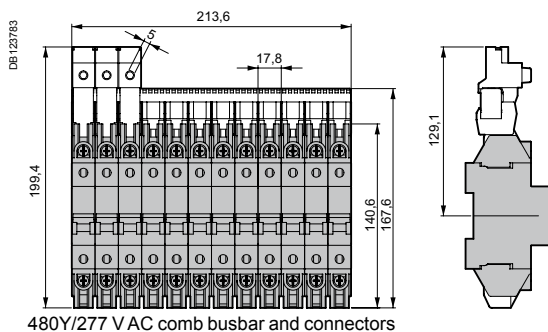
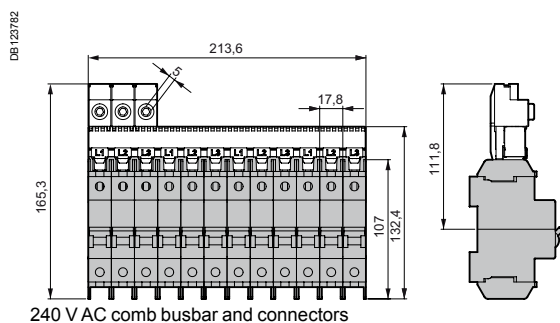
They perform distribution and subdistribution of the electric power supply and allow rapid assembly and disassembly of equipment.

Connection accessories	Comb busbars						Accessories				
	Comb busbar						Insulated connector		Tooth cover end-piece		
	 PB106432-25 1P x 240 V - 12 modules		 DB106436-25 3P x 480Y - 12 modules		 PB106437-25 3P 480Y - Can accept auxiliaries		 PB106438-10		 PB106434-10		
Function	<ul style="list-style-type: none"> The comb busbars make it easier to install Schneider Electric UL 489 circuit breakers They must not be cut 						<ul style="list-style-type: none"> Comb busbar power supply Vertical incoming feeder 		<ul style="list-style-type: none"> Insulation of teeth remaining free 		
Use	<ul style="list-style-type: none"> Power supply by insulated connector 						<ul style="list-style-type: none"> For semi-rigid copper cable of 4 to 35 mm² (#1-#12 AWG) Tightening torque: 6 N.m (53 lb.in) max. 				
Number of poles	1P		2P		3P		All		All		
Voltage rating (Ue)	240 V AC		480Y/277 V AC		240 V CA 480Y/277 V AC		240 V AC 480Y/277 V AC		-		
Catalogue numbers	10170	10171	10180	10181	10172	10182	10173	10183	10175	10185	10190
								10193 *			
Number of 18 mm modules	6	12	6	12	12		12		-		-
Set of	5		5		5		15		9		

Technical specifications	
Insulation voltage (Ui)	1000 V
Impulse withstand voltage (Uimp)	12 kV
Acceptable current at 40°C (Ie)	240 V : 100 A 480Y : 80 A
Max. current per feeder	240 V : 35 A 480Y : 20 A
Resistance to short-circuit currents	Compatible with the breaking capacity of Schneider Electric modular circuit breakers
Fire resistance	Self-extinguishability 960°C 30 s/30 s
Colour	RAL 9001
Standards	UL508
	UL486E
	RAL 1021

* With spare spaces of 18 mm for electrical auxiliary

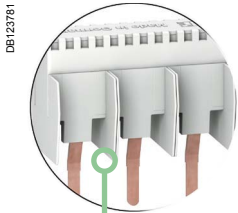
Dimensions (mm)



Connection comb busbars for C60 UL 489 circuit breakers (cont.)

Comb busbar

- Shape ensuring perfect indexing in the circuit-breaker terminals



480Y/277 V comb busbar

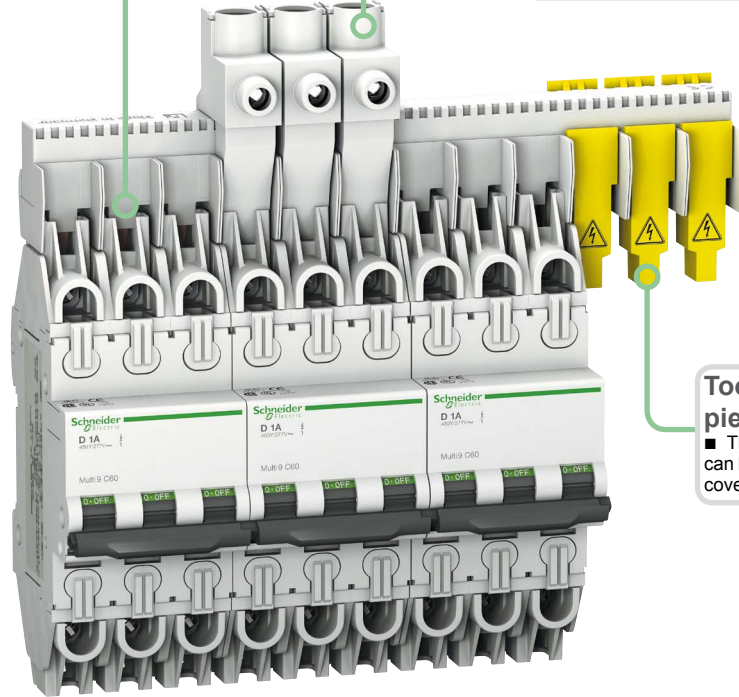
- Phase separators ensuring electrical insulation

Insulated connectors

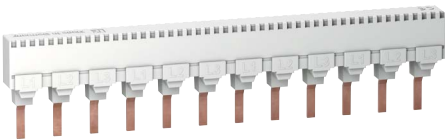
- Clip onto the comb busbar's insulating material, which gives them very great stability
- Connect to the tunnel terminal of the circuit breaker:
 - through the front on 480Y/277 V comb busbars
 - through the rear on 240 V comb busbars
- Terminal tightening from the front

Tooth cover end-pieces

- The teeth left on standby can be insulated by tooth cover end-pieces



PB106432-60



3P, 240 V comb busbar - 12 modules

PB106436-60



3P, 480Y/277 V comb busbar - 12 modules

PB106437-60



3P, 480Y/277 V comb busbar - 12 modules for auxiliaries

Comb busbar that can accept auxiliaries

- With spare spaces of 18 mm for electrical auxiliary:
 - one 18 mm electrical auxiliary (MN, MX, etc.) or
 - two 9 mm electrical auxiliaries (OF, SD, etc.)



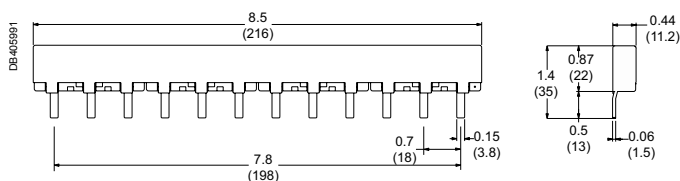
The comb busbars are used only for C60 circuit-breakers in conformity with standards UL 1077 / CSA C22.2 No. 235-04 / IEC 60947-2 / GB 14048-2

They perform distribution and subdistribution of the electric power supply and allow rapid assembly and disassembly of equipment.

	Comb busbars			Accessory
Connection accessories	Comb busbar			Tooth cover end-piece
Function	<ul style="list-style-type: none"> The comb busbars make it easier to install Schneider Electric UL 1077 circuit breakers Power supply directly in the cage of the circuit-breaker 			<ul style="list-style-type: none"> The Tooth Caps are insulated protectors which may be slipped onto the unused teeth of the comb busbar They come in strips with 1-pole spacing, but can be snapped apart to be used individually
Number of poles	1P	2P	3P	All
Voltage rating (Ue)	480Y/277 V AC	480Y/277 V AC	480Y/277 V AC	–
Catalogue numbers	10285	10286	10287	60488
Number of 18 mm modules	12 (8.5 inches/216 mm)	12 (8.5 inches/216 mm)	12 (8.5 inches/216 mm)	–
Set of	1	1	1	20

Technical specifications	
Insulation voltage (Ui)	690 V
Impulse withstand voltage (Uimp)	12 kV under 240 V 5 kV under 480Y/277 V or 277 V
Acceptable current at 40°C (Ie)	63 A with 1 central power supply point 100 A with 2 power supply points
	<ul style="list-style-type: none"> Power supply via cable directly in the cage of the device: <ul style="list-style-type: none"> cross section maxi: 3 AWG (25 mm²) cross section mini: 10 AWG (5.27 mm²)
Resistance to short-circuit currents	Compatible with the breaking capacity of C60 UL 1077 Schneider Electric modular circuit breakers
Fire resistance	Self-extinguishability 960°C 30 s/30 s
Colour	RAL 9001 RAL 1021

Dimensions (inches/mm)





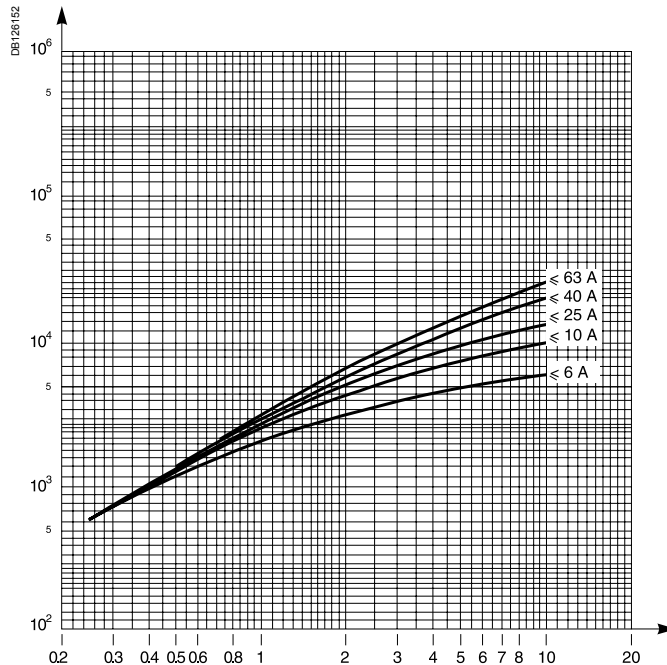
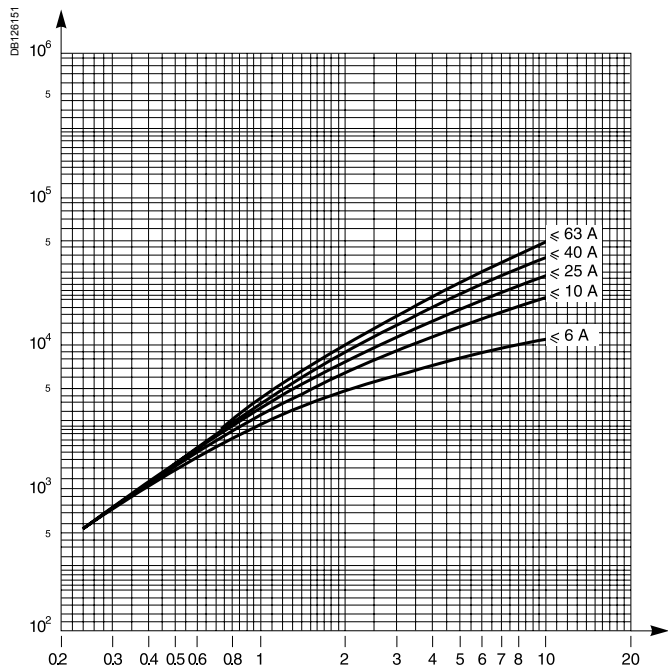
C60

UL 489 / CSA C22.2 No. 5-02, UL 1077 / CSA C22.2 No. 235-04

Ue : ≤ 277 V ~ (UL 489 - UL 1077) 1P

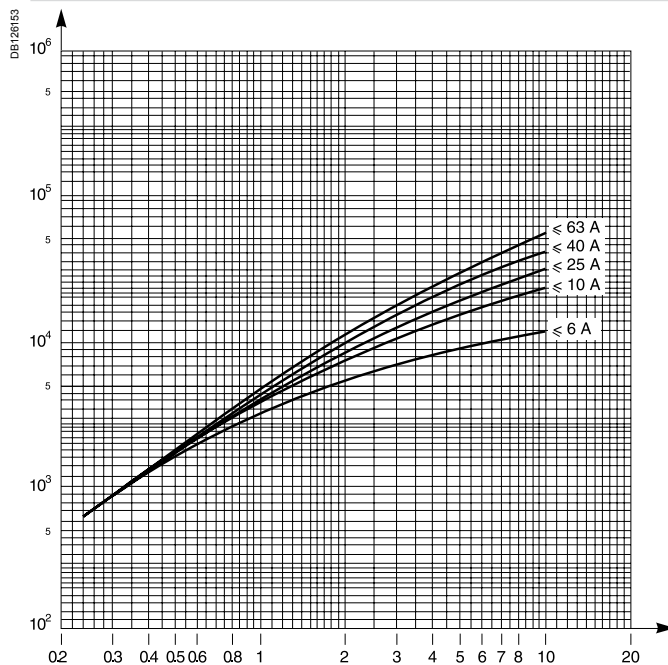
UL 489 / CSA C22.2 No. 5-02, UL 1077 / CSA C22.2 No. 235-04

Ue : ≤ 277 V ~ 2, 3, 4P



UL 1077 / CSA C22.2 No. 235-04

Ue : 480Y / 277 V ~ 2, 3, 4P

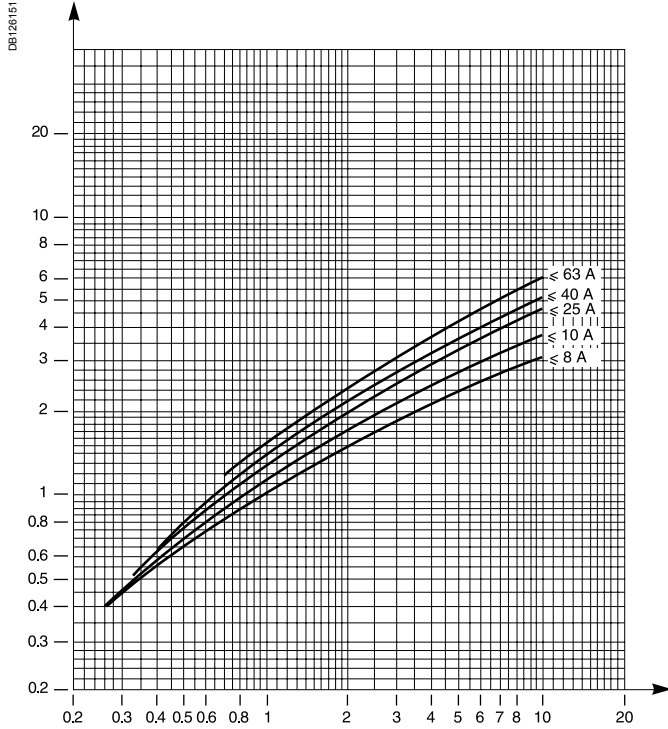




C60

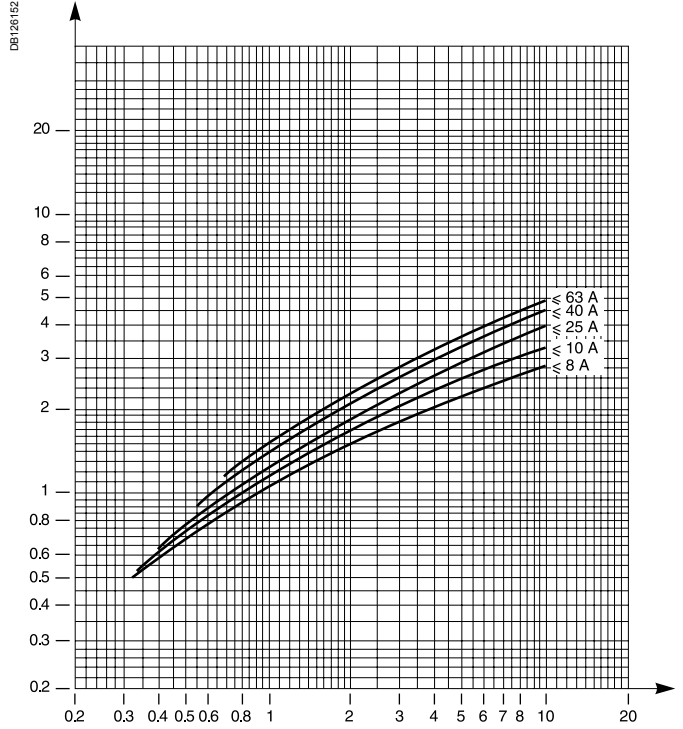
UL 1077 / CSA C22.2 No. 235-04

Ue : ≤ 240 V ~ (UL 489 - UL 1077) 1P



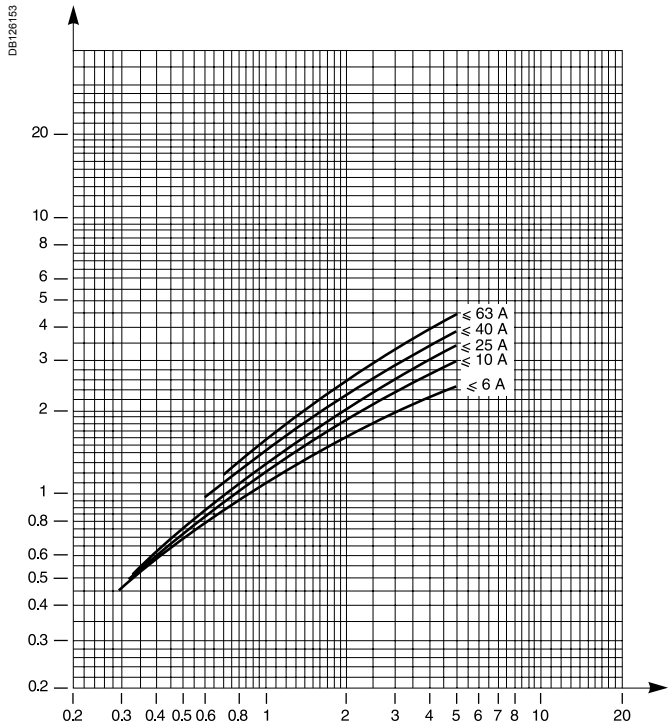
UL 489 / CSA C22.2 No. 5-02, UL 1077 / CSA C22.2 No. 235-04

Ue : ≤ 240 V ~ 2, 3, 4P



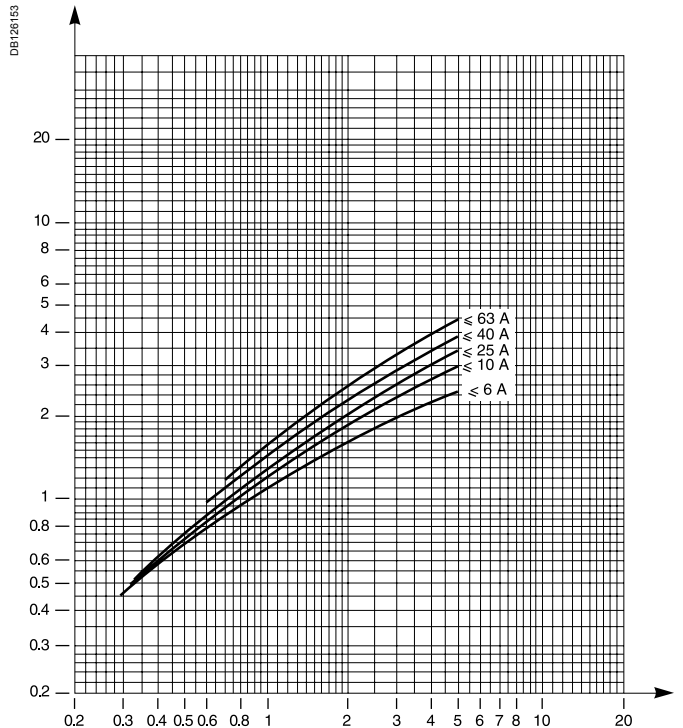
UL 1077 / CSA C22.2 No. 235-04

Ue : ≤ 277 V ~ (UL 1077) 1P



UL 1077 / CSA C22.2 No. 235-04

Ue : 480Y / 277 V ~ 2, 3, 4P



C60 tripping curves

UL 489 Listed C60

Miniature Circuit Breakers

IEC 60947-2 / GB 14048-2



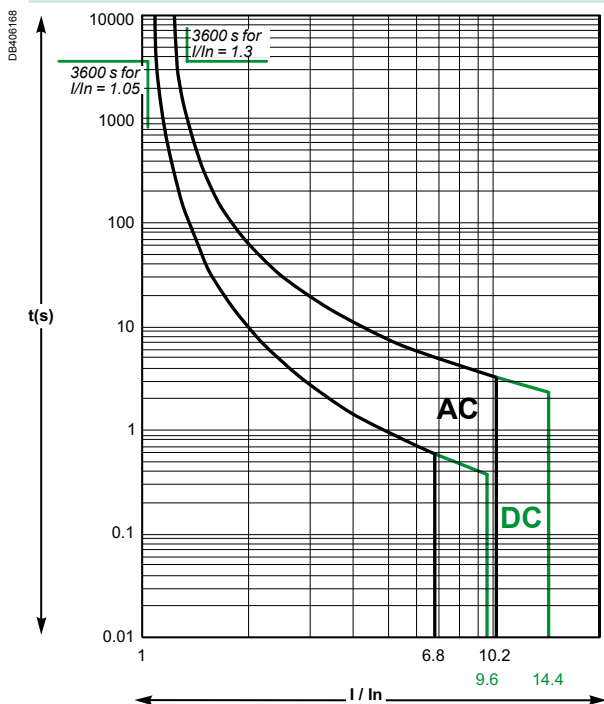
Operating range of the magnetic trip unit:

- B curve :
 - in alternative current: $4 I_n \pm 20\%$
 - in direct current: $5.6 I_n \pm 20\%$
- C curve :
 - in alternative current: $8.5 I_n \pm 20\%$
 - in direct current: $12 I_n \pm 20\%$
- D curve :
 - in alternative current: $12 I_n \pm 20\%$
 - in direct current: $18 I_n \pm 20\%$

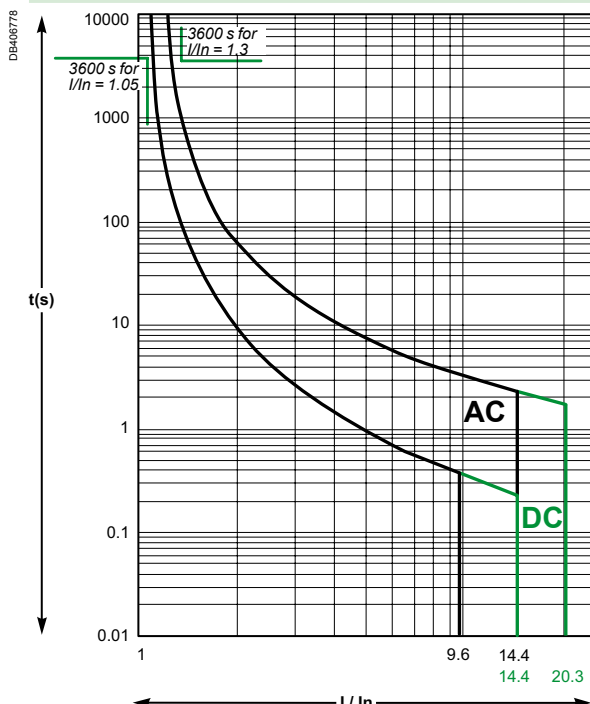
The curves represent: the thermal tripping limits at low temperatures (25 °C), poles loaded.

C60

UL489 Listed C60N - C curve - AC/DC



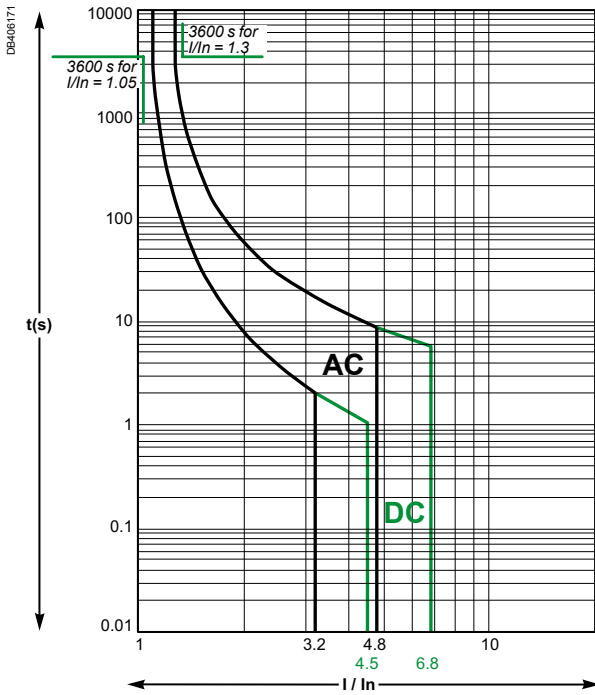
UL 489 Listed C60N - D curve - AC/DC



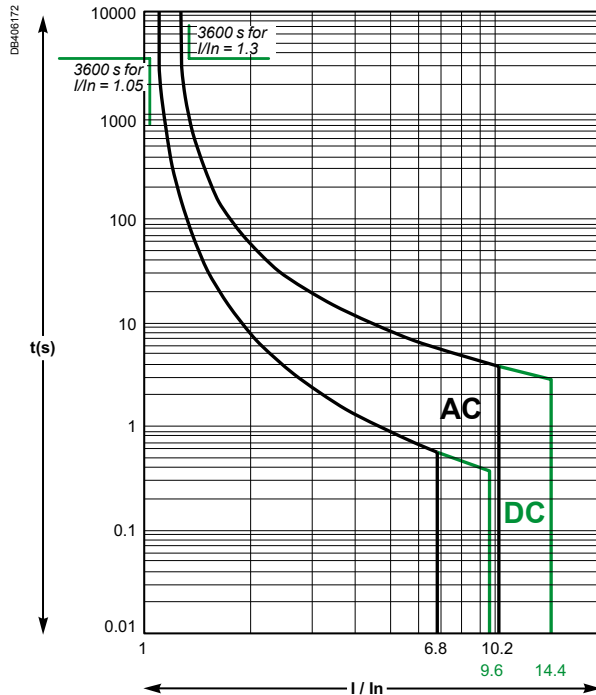


C60

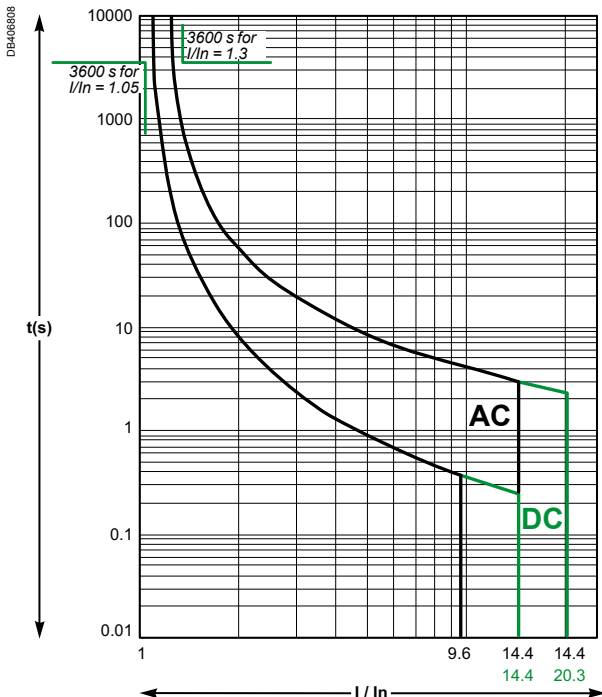
UL 1077 Recognized C60 - B curve - AC/DC



UL 1077 Recognized C60 - C curve - AC/DC



UL 1077 Recognized C60 - D curve - AC/DC





Influence of temperature on the operation

Circuit breakers

High temperatures

- A rise in temperature causes lowering of the thermal threshold (tripping on overload).
 - Protection is still ensured: the tripping threshold remains lower than the current acceptable by the cable (I_c)
 - To prevent nuisance tripping, it should be checked that this threshold remains higher than the maximum operating current (I_B) of the circuit, defined by:
 - the rated load currents,
 - the coefficients of expansion and simultaneity of use.
- If the temperature is sufficiently high for the tripping threshold to become lower than the operating current I_B , switchboard ventilation should be provided for.

Low temperatures

- A fall in temperature increases the thermal tripping threshold of the circuit breaker.
- There is no risk of nuisance tripping: the threshold remains higher than the maximum operating current of the circuit (I_B) demanded by the loads.
- It should be checked that the cable remains suitably protected, i.e. that its acceptable current (I_c) is higher than the values shown in the following tables (in amperes).

When the ambient temperature could vary within a broad range, both these aspects must be taken into account:

- the difference between the maximum operating current of the circuit (I_B) and the tripping threshold of the circuit breaker for the minimum ambient temperature,
- the difference between the strength of the cable (I_c) and the maximum tripping threshold of the circuit breaker for the maximum ambient temperature.

Maximum permissible current

- The maximum current allowed to flow through the device depends on the ambient temperature in which it is placed.
- The ambient temperature is the temperature inside the enclosure or switchboard in which the devices are installed.
- The reference temperature is in a halftone colour for the different devices.
- When several devices operating simultaneously are mounted side by side in a small enclosure, a temperature rise in the enclosure results in a reduction in the operating current. A reduction coefficient of 0.8 will then have to be assigned to the rating (already derated, if applicable, depending on the ambient temperature).
- Example:

Depending on the ambient temperature and the method of installation, the table below shows how to determine, for a C60 the operating currents not to be exceeded (reference temperature 25°C).

The reference temperature is in half-tone colour.

Rating (A)	-30°C -22°F	-25°C -13°F	-20°C -4°F	-15°C 5°F	-10°C 14°F	-5°C 23°F	0°C 32°F	5°C 41°F	10°C 50°F	15°C 59°F	20°C 68°F	25°C 77°F	30°C 86°F	35°C 95°F	40°C 104°F	45°C 113°F	50°C 122°F	55°C 131°F	60°C 140°F	65°C 149°F	70°C 158°F
0.5	0.61	0.60	0.59	0.58	0.57	0.56	0.55	0.54	0.53	0.52	0.51	0.5	0.49	0.48	0.47	0.45	0.44	0.43	0.42	0.40	0.39
1	1.35	1.33	1.30	1.27	1.24	1.21	1.17	1.14	1.11	1.07	1.04	1	0.96	0.92	0.88	0.83	0.79	0.74	0.69	0.63	0.56
1.2	1.52	1.49	1.46	1.44	1.41	1.38	1.35	1.32	1.29	1.26	1.23	1	1.17	1.13	1.10	1.06	1.02	0.99	0.94	0.90	0.86
1.5	1.88	1.85	1.82	1.79	1.75	1.72	1.68	1.65	1.61	1.58	1.54	1.5	1.46	1.42	1.38	1.33	1.29	1.24	1.20	1.15	1.09
2	2.52	2.48	2.44	2.39	2.35	2.30	2.25	2.20	2.16	2.10	2.05	2	1.95	1.89	1.83	1.77	1.71	1.65	1.58	1.51	1.44
3	3.75	3.69	3.62	3.56	3.49	3.43	3.36	3.29	3.22	3.15	3.08	3	2.92	2.84	2.76	2.68	2.59	2.50	2.41	2.31	2.21
4	5.02	4.93	4.85	4.76	4.67	4.58	4.49	4.40	4.30	4.20	4.10	4	3.89	3.79	3.67	3.56	3.44	3.32	3.19	3.06	2.92
5	6.19	6.09	5.99	5.89	5.79	5.68	5.57	5.46	5.35	5.24	5.12	5	4.88	4.75	4.62	4.49	4.35	4.21	4.06	3.91	3.75
6	7.77	7.63	7.48	7.33	7.18	7.02	6.86	6.70	6.53	6.36	6.18	6	5.81	5.62	5.42	5.21	4.99	4.76	4.52	4.27	4.00
7	8.61	8.48	8.34	8.20	8.06	7.92	7.77	7.63	7.47	7.32	7.16	7	6.83	6.66	6.49	6.31	6.13	5.94	5.74	5.54	5.33
8	9.94	9.78	9.62	9.45	9.28	9.11	8.94	8.76	8.57	8.39	8.20	8	7.80	7.59	7.38	7.16	6.94	6.71	6.47	6.22	5.96
10	12.43	12.23	12.02	11.82	11.60	11.39	11.17	10.95	10.72	10.48	10.24	10	9.75	9.49	9.23	8.96	8.67	8.38	8.08	7.77	7.45
13	15.64	15.42	15.19	14.97	14.73	14.50	14.26	14.02	13.77	13.52	13.26	13	12.73	12.46	12.18	11.90	11.60	11.30	11.00	10.68	10.35
15	18.07	17.81	17.55	17.28	17.02	16.74	16.47	16.18	15.90	15.60	15.30	15	14.69	14.37	14.05	13.72	13.38	13.03	12.67	12.30	11.92
16	18.88	18.64	18.39	18.14	17.89	17.63	17.37	17.10	16.84	16.56	16.28	16	15.71	15.42	15.12	14.81	14.50	14.18	13.86	13.52	13.18
20	24.65	24.26	23.87	23.47	23.07	22.65	22.23	21.81	21.37	20.92	20.47	20	19.52	19.03	18.53	18.01	17.48	16.93	16.37	15.78	15.17
25	30.71	30.24	29.76	29.27	28.77	28.26	27.74	27.22	26.68	26.13	25.57	25	24.41	23.81	23.20	22.57	21.92	21.25	20.55	19.84	19.09
30	37.35	36.74	36.12	35.50	34.86	34.21	33.54	32.86	32.17	31.46	30.74	30	29.24	28.46	27.66	26.83	25.98	25.10	24.19	23.24	22.25
32	38.45	37.91	37.36	36.80	36.24	35.66	35.08	34.48	33.88	33.27	32.64	32	31.35	30.68	30.00	29.31	28.59	27.86	27.11	26.34	25.54
35	44.15	43.40	42.63	41.86	41.06	40.25	39.42	38.58	37.72	36.83	35.93	35	34.05	33.06	32.05	31.01	29.93	28.81	27.64	26.42	25.14
40	48.92	48.17	47.42	46.65	45.87	45.08	44.28	43.45	42.62	41.76	40.89	40	39.09	38.16	37.20	36.22	35.21	34.17	33.10	31.99	30.84
50	59.93	59.09	58.25	57.39	56.52	55.63	54.74	53.82	52.89	51.95	50.98	50	49.00	47.97	46.93	45.86	44.77	43.64	42.49	41.31	40.09
60	76.16	74.83	73.48	72.11	70.71	69.28	67.82	66.33	64.81	63.25	61.64	60	58.31	56.57	54.77	52.92	50.99	48.99	46.90	44.72	42.43
63	78.16	76.91	75.63	74.33	73.01	71.67	70.30	68.90	67.47	66.02	64.53	63	61.44	59.83	58.18	56.49	54.74	52.93	51.06	49.12	47.10



What is the power consumption per pole?

The table below shows the device's power consumption in watts for each rating, per pole, under In:

Rating (A)	0.5	1	1.2	1.5	2	3	4	5	6	7	8	10	13	15	16	20	25	30	32	35	40	45	50	60	63
C60	2.61	1.35	2.00	1.97	1.70	1.91	1.96	2.16	1.22	1.41	1.66	1.90	2.37	2.25	2.59	2.18	2.68	2.73	3.87	3.08	3.92	4.14	4.60	4.98	5.23

Impedance calculation:

$$Z = P / I^2$$

Z: impedance in Ohms

P: dissipated power in Watts (table values)

I: rating in Amperes

Voltage drop calculation:

$$U = P / I$$

U: voltage drop in Volts

P: dissipated power in Watts (table values)

I: rating in Amperes

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Printed on ecological paper

Publishing: Schneider Electric
Design: SEDOC
Printing: