Multi 9™ system

MERLIN GERIN
mastering electrical power

Multi 9 System

miniature circuit breakers

GENERAL INFORMATION

Description:

The Multi 9 modular system of miniature circuit breakers (MCB), accessories, and installation equipment is the most complete offering in the world for this class of equipment. All of the Merlin Gerin devices are approved or meet the standards as noted on each catalog page.

- **Underwriters Laboratories**: UL 1077 Supplementary protectors ®
  File # E90509
- **Canadian Standards Association**: CSA C22.2 no 235 Supplementary protectors
  File # LR20849
- **IEC** 947.2 and **IEC** 898 which includes VDE, BS, AS, KEMA and others

The Multi 9 System of products are used worldwide and available in more than eighty (80) countries.

The modular Multi 9 (9mm for each module) is designed to be mounted either on a Din Rail or front panel with the use of the front mounting kit.

- All breakers include line and load side box lug terminals (pressure plate type) suitable for use with multiple wires. Terminals, depending on (MCB) ratings, are available for use with wire up to #1 AWG. Screw type terminals are available upon request

- UR/CSA approved field installable accessories for both the C60N & NC100H line of circuit breakers are listed below.

  Shunt trip (MX)
  Shunt trip with separate aux. switch (MX+OF)
  Auxiliary switched (OF)
  Alarm switch (SD)
  Under voltage (MN)

(Up to four accessories may be mounted on each breaker).

- Current limiting capability. The advanced design of the Multi 9 range provides current limitation with far better protection than conventional circuit breakers. For example, on a 6A rating with a prospective short circuit of 5000A, the current will be limited at 350A or 7%.

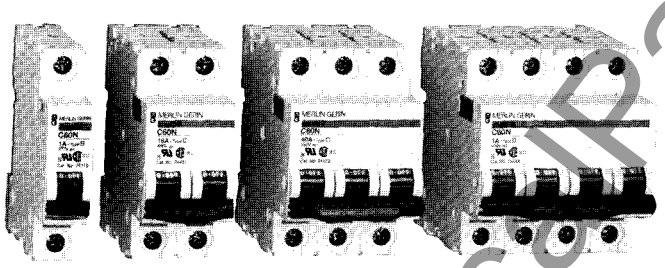
- Endurance for C60N & NC100H is 20,000 cycles (O-C)

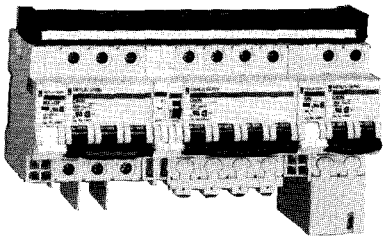
- Voltage withstand 6000V impulse rating

- All MCB's are suitable for reverse feed

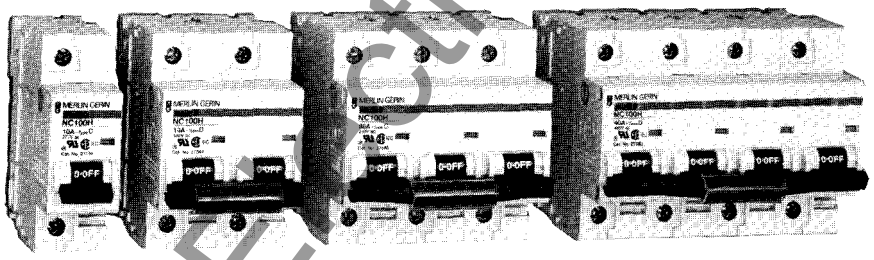
- Ground Fault Protectors (IEC only)

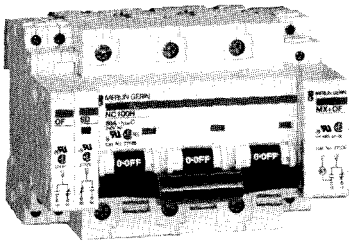
C-60





NC-100





Time Current Curves:

The Multi 9 circuit breakers are each available with several different trip characteristics to provide greater flexibility in custom application to meet system needs.

***B Curve** - Instantaneous magnetic trip between 3.2 and 4.8 x I_N for computers, electronic and generator applications.

***C Curve** - Instantaneous magnetic trip between 7 and 10 x I_N for many general purpose applications.

***D Curve** - Instantaneous magnetic trip between 10 and 14 x I_N for motor, transformers, etc. applications.

***MA Curve** - Instantaneous magnetic only 12 x I_N for motor or other special applications- (IEC only).

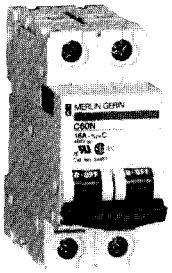
(Overload curves are calibrated for an ambient temperature of 25° C for type C60N and NC100H (UL-CSA), 40•C for type C60L (IEC).

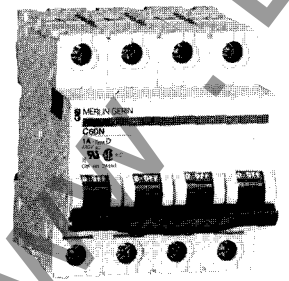
C60N

UL 1077
CSA C22.2
IEC 947.2

B, C and D tripping curves

no. of poles	width in mod. of 9 mm	ratings (A)	cat no B curve	C curve	D curve	List Price
1P	2	1	24110	24425	24500	$ 37
		2	24111	24426	24501	37
		3	24112	24427	24502	37
		4	24113	24428	24503	37
		6	24114	24430	24504	37
		8	24115	24431	24505	37
		10	24116	24432	24506	37
		13	24117	24433	24507	37
		16	24118	24434	24508	37
		20	24119	24435	24509	37
		25	24120	24436	24510	37
		32	24121	24437	24511	37
		40	24122	24438	24512	37
		50	24123	24439	24513	37
		63	24124	24440	24514	44
1 protected pole						
2P	4	1	24125	24442	24516	$ 74
		2	24126	24443	24517	74
		3	24127	24444	24518	74
		4	24128	24445	24519	74
		6	24129	24447	24520	74
		8	24130	24448	24521	74
		10	24131	24449	24522	74
		13	24132	24450	24523	74
		16	24133	24451	24524	74
		20	24134	24452	24525	74
		25	24135	24453	24526	74
		32	24136	24454	24527	74
		40	24137	24455	24528	74
		50	24138	24456	24529	74
		63	24139	24457	24530	89
2 protected poles						
3P	6	1	24140	24459	24532	$ 111
		2	24141	24460	24533	111
		3	24142	24461	24534	111
		4	24143	24462	24535	111
		6	24144	24464	24536	111
		8	24145	24465	24537	111
		10	24146	24466	24538	111
		13	24147	24467	24539	111
		16	24148	24468	24540	111
		20	24149	24469	24541	111
		25	24150	24470	24542	111
		32	24151	24471	24543	111
		40	24152	24472	24544	111
		50	24153	24473	24545	111
		63	24154	24474	24546	133
3 protected poles						
4P	8	1	24155	24476	24548	$ 148
		2	24156	24477	24549	148
		3	24157	24478	24550	148
		4	24158	24479	24551	148
		6	24159	24481	24552	148
		8	24160	24482	24553	148
		10	24161	24483	24554	148
		13	24162	24484	24555	148
		16	24163	24485	24556	148
		20	24164	24486	24557	148
		25	24165	24487	24558	148
		32	24166	24488	24559	148
		40	24167	24489	24560	148
		50	24168	24490	24561	148
		63	24169	24491	24562	188
4 protected poles						





Application
Control and protection of circuits against overloads and short-circuits
- in control circuit applications
- in commercial and industrial electrical distribution systems

Technical data
- **ampere rating:**
1 to 63 A at 25° C.
- **voltage rating:** max 480/277VAC.
- **interrupting capacity**

UL 1077/CSA 22.2/IEC 947.2

rating (A)	type	voltage AC(V)	interrupting capacity (A)
1 to 63	1, 2, 3, 4P	240VAC	10000
	1P	277VAC	5000
	2, 3, 4P	480/277VAC	5000
1 to 63	1P	65VDC	10000
	2P	125VDC	10000

- **positive contact indication**
- **current limiting**
- **fast-closing contacts**
- **number of operating cycles** (O-C) : 20000.
- **tripping characteristics:**
  B type: magnetic setting between 3,2 and 4,8 times ampere rating
  C type: magnetic setting between 7 and 10 times ampere rating
  D type: magnetic setting between 10 and 14 times ampere rating
- **tropicalization:** treatment 2 (IEC) (relative humidity 95 % at 55°C).
- **weight** (oz/g):

type	1P	2P	3P	4P
	3.85/110	7.70/220	11.55/330	15.40/440

- **pressure terminals: cable size (Cu)**

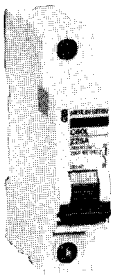
1 to 25A	#18 to #4 AWG
32 to 63A	#18 to #2 AWG

(screw type connections or rear connections available on request)

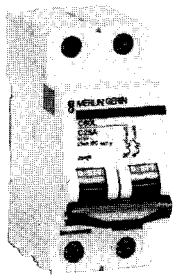
Auxiliaries: page 5
Accessories: page 6 & 7
Dimensions: page 17

C60L

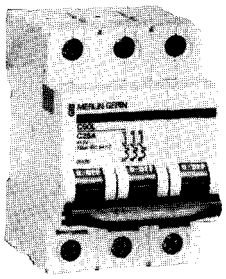
IEC 947.2



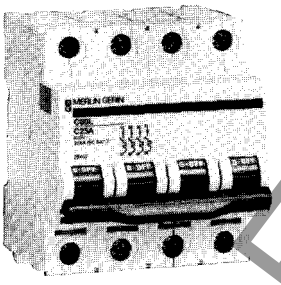
no. of poles	width in mod. of 9 mm	ratings (A)	cat. no. C curve	List Price
1P	**2**	1	**25392**	**$ 42**
		2	**25393**	**42**
		3	**25394**	**42**
		4	**25395**	**42**
		6	**25396**	**42**
		10	**25397**	**42**
		16	**25398**	**42**
		20	**25399**	**42**
		25	**25400**	**42**
		32	**25401**	**42**
		40	**25402**	**42**
		50	**25403**	**42**
		63	**25404**	**48**
1 protected pole				



2P	**4**	1	**25418**	**$ 57**
		2	**25419**	**57**
		3	**25420**	**57**
		4	**25421**	**57**
		6	**25422**	**57**
		10	**25423**	**57**
		16	**25424**	**57**
		20	**25425**	**57**
		25	**25426**	**57**
		32	**25427**	**57**
		40	**25428**	**57**
		50	**25429**	**57**
		63	**25430**	**72**
2 protected poles				



3P	**6**	1	**25431**	**$ 129**
		2	**25432**	**129**
		3	**25433**	**129**
		4	**25434**	**129**
		6	**25435**	**129**
		10	**25436**	**129**
		16	**25437**	**129**
		20	**25438**	**129**
		25	**25439**	**129**
		32	**25440**	**129**
		40	**25441**	**129**
		50	**25442**	**129**
		63	**25443**	**162**
3 protected poles				



4P	**8**	1	**25444**	**$ 168**
		2	**25445**	**168**
		3	**25446**	**168**
		4	**25447**	**168**
		6	**25448**	**168**
		10	**25449**	**168**
		16	**25450**	**168**
		20	**25451**	**168**
		25	**25452**	**168**
		32	**25453**	**168**
		40	**25454**	**168**
		50	**25455**	**168**
		63	**25456**	**210**
4 protected poles				

Application

- high fault level
- control and protection of circuits against overloads and short-circuits
- more particularly adapted for installations with high transient currents (LV/LV transformer, motors…)

Technical data

- **ampere rating:** AC 1 to 63 A at **40°C.**
- **voltage rating:** 240/415 V
- **interrupting capacity:** IEC 947.2

rating (A)	type	voltage (V)	interrupting capacity (A)
1 to	1P	240	25000
25	2, 3, 4P	240	50000
	2, 3, 4P	415	25000
32-40	1P	240	20000
	2, 3, 4P	240	40000
	2, 3, 4P	415	20000
50-63	1P	240	15000
	2, 3, 4P	240	30000
	2, 3, 4P	415	15000

- **number of operating cycles** (O-C): 20000.
- **current limiting**
- **fast-closing contacts**
- **tripping characteristics:**

D curve: the magnetic releases operate between 10 and 14 times ampere rating

- **tropicalization:** treatment 2 (relative humidity 95 % at 55°C).
- **weight** (g)**:**

type	1P	2P	3P	4P
	110	220	330	440

- **pressure terminals: cable size (Cu)**

1 to 25A	#18 to #4 AWG
32 to 63A	#18 to #2 AWG

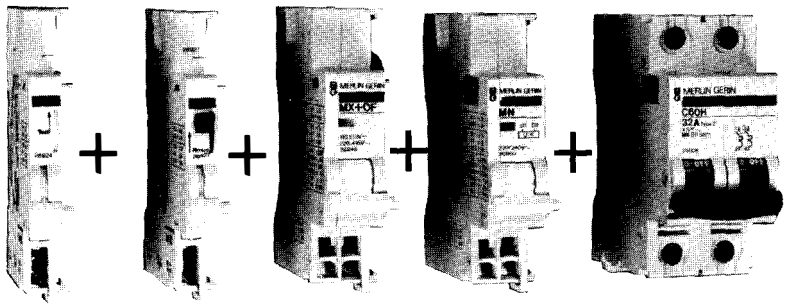
- not UL/CSA listed

(screw type connections or rear connections available on request)

Auxiliaries: page 5
Accessories: page 6 & 7
Dimensions: page 17

C60N
electrical auxiliaries

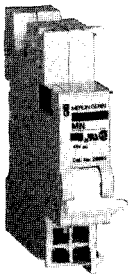
UL 1077
CSA C22.2
IEC 947.2



MX + OF shunt trip release

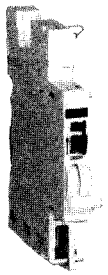
width in mod of 9 mm	voltage V	cat. no.	List Price
2	220 to 277 V AC 110 to 130 V DC	26972	$ 50
	48 to 130 V AC 48 V DC	26973	50
	24 V AC/DC	26974	50

MN under voltage release



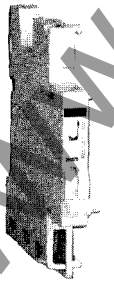
width in mod of 9 mm	voltage V	cat. no.	List Price
2	220 to 240V AC	26964	$ 72
	48 V AC	26965	72
	48 V DC	26966	72

SD alarm switch



width in mod. of 9 mm	cat. no.	List Price
1	26928	$ 21

OF auxiliary (ON/OFF) switch



width in mod. of 9 mm	cat. no.	List Price
1	26925	$ 21

C60 auxiliaries enable remote tripping or remote indication of the ON/OFF positions of an mcb. They are mounted by clipping on the left hand side of the mcb.

remote tripping

■ **MX shunt trip +OF**

❑ enables the mcb to be tripped from a remote location
❑ is equipped with a cut-off switch in series with the coil
❑ all shunt trip release devices are equipped with a red flag trip indicator
❑ shunt trip will operate at 75% of rated voltage.
❑ allows remote indication of the "OFF" or "ON" position of the mcb by using the same voltage as the one feeding the shunt trip (terminals 12 and 14)

■ **MN undervoltage release**

❑ enables miniature circuit breakers to be tripped either when the voltage drops or by operation of the "OFF" push button of a remote device tripping between 70 and 35% of rated voltage, closing at 85% or more.
❑ prevents the mcb from being switched "ON" again if the undervoltage release supply is not present
❑ all under voltage releases are equipped with a red flag trip indicator

consumption of releases

	(V)		(W or VA)
MX	220 to 240 V AC	pickup	50
	48/130 V AC	pickup	200
	110/130 V DC	pickup	10
	48 V CA - DC	pickup	22
	24 V CA - DC	pickup	120
MN	220 to 240 V AC	hold	4,1
	48 V AC	hold	4,3
	48 V DC	hold	2,0

remote indication

■ **SD alarm switch**

❑ an indicating device which monitors the tripping of an mcb
This device offers the following
❑ a red flag trip indicator
❑ ability to reset without closing the mcb
❑ test function

■ **OF auxiliary switch**

❑ a changeover switch which acts as an indicating or control device to monitor the "ON" or "OFF" positions of an mcb
❑ test function

interrupting capacity of switches (OF-SD)

voltage (V)	(A)
277 V AC	3
240 V AC	6
130 V DC	1
48 V DC	2
24 V DC	6

■ **connections:** screw clamp terminals for one cable #18 to 14 AWG or two cables #18 to 16 AWG.

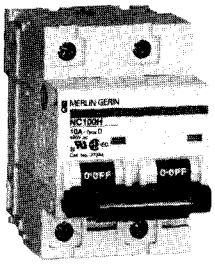
Dimensions: page 17

UL 1077
CSA C22.2
IEC 947.2
B, C and D tripping curves

NC100H

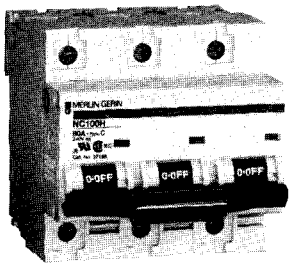
no. of poles	width in mod. of 9 mm	ratings (A)	cat no. B curve	C curve	D curve	List Price
1P	2	10		27154	27333	$ 47
		16		27155	27334	47
		20		27156	27335	47
		25		27157	27336	47
		32		27158	27337	47
		40		27159	27338	47
		50		27160		47
		63		27162		56
		80	27164	27163		61

1 protected pole



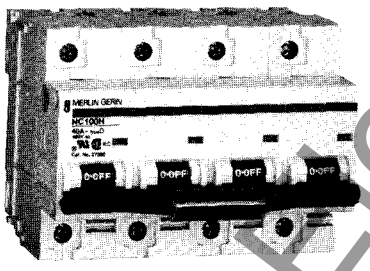
2P	4	10		27166	27344	$ 94
		16		27167	27345	94
		20		27168	27346	94
		25		27169	27347	94
		32		27170	27348	94
		40		27171	27349	94
		50		27172		94
		63		27173		113
		80	27175	27174		122

2 protected poles



3P	3	10		27177	27355	$ 141
		16		27178	27356	141
		20		27179	27357	141
		25		27180	27358	141
		32		27181	27359	141
		40		27182	27360	141
		50		27183		141
		63		27184		169
		80	27186	27185		183

3 protected poles



4P	8	10		27188	27366	$ 185
		16		27189	27367	185
		20		27190	27368	185
		25		27191	27269	185
		32		27192	27270	185
		40		27193	27271	185
		50		27194		185
		63		27195		230
		80	27197	27196		270

4 protected poles

Application

■ control and protection of circuits against overloads and short-circuits in industrial control and distribution systems.

Technical data

■ **ampere rating:** 10, 16, 20, 25, 32, 40, 50, 63, 80A

■ **voltage rating: 240 or 480/277 VAC**

■ **interrupting capacity:**

UL 1077 and CSA 22.2

rat. (A)	type	volt. (V)	interrupting capacity(A)
10 to 40	1,2,3,4P	240VAC	20,000
50 to 80	1,2,3,4P	240VAC	5,000
10 to 40	1P	277VAC	10,000
10 to 40	2,3,4P	480/277VAC	10,000
10 to 40	1P	125VDC	10,000
10 to 40	2P	250VDC	10,000
50 to 80	1P	65VDC	10,000
50 to 80	2P	125VDC	10,000

■ **positive contact indication**

■ **current limiting**

■ **fast-closing contacts**

■ **tripping characteristics:**

B type: magnetic setting between 3,2 and 4,8 times ampere rating

C type: magnetic setting between 7 and 10 times ampere rating

D type: magnetic setting between 10 and 14 times ampere rating

■ **number of operating cycles** (O-C): 20000

■ **tropicalization**: treatment 2 IEC (relative humidity 95% at 55°C).

■ **weight** (oz/g):

type	1P	2P	3P	4P
	6.30/180	12.60/360	18.9/540	25.20/720

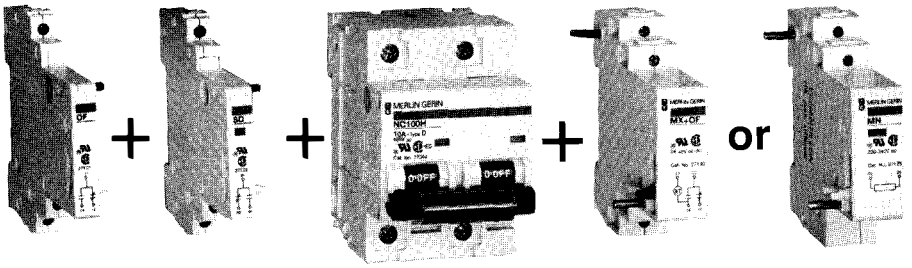
■ **connections**: pressure terminals

10 to 40A	#18 to #2 AWG
50 to 80A	# 8 to #1 AWG

Auxiliaries: page 9
Accessories: page 10 & 11
Dimensions: page 18

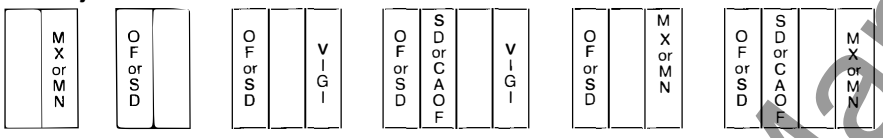
NC100H
electrical auxiliaries

UL 1077
CSA C22.2
IEC 947.2

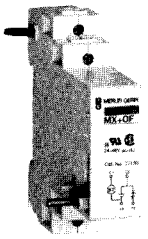


OF **SD alarm switch** **mcb** **MX + OF** **MN**

auxiliary combinations



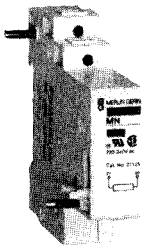
MX + OF shunt trip release



2 poles

width in mod. of 9 mm	voltage	cat. no.	List Price
2	220 to 227 V AC	**27128**	**$ 50**
	110 to 220 V AC		
	110 to 130 VDC	**27129**	**50**
	24 to 48 V AC		
	24 to 48 V DC	**27130**	**50**

MN under voltage release



width in mod. of 9 mm	voltage	cat. no.	List Price
2	220 to 240 V AC	**27125**	**$ 72**
2	110 to 120 V AC	**27126**	**72**

SD alarm switch

width in mod. of 9 mm	cat. no.	List Price
1	**27128**	**$ 21**

OF auxiliary (ON/OFF) switch

width in mod. of 9 mm	cat.no.	List Price
1	**27121**	**$ 21**

NC100H auxiliaries enable remote tripping or remote indication of the ON/OFF position of an mcb.

Remote tripping:
By means of a (MX) shunt trip or (MN) undervoltage release module fitted to the right hand side of the mcb.

■ **MX shunt trip release +OF**
Immediately trips the mcb when energized.
❑ fitted with a cut-off contact
❑ shunt trip will operate at 75% of rated voltage.
❑ equipped with a contact (terminals 12 and 14) that indicates the "open" or "closed" position of the mcb using the coil voltage.

■ **MN undervoltage release**
Trips the mcb when the supply voltage drops (between 70 % and 35 %) and prevents reclosing until the supply voltage is restored 85 % (Vn) or more.

❑ applications:
- emergency off pushbutton
- safety feature on circuit supplying several machines preventing uncontrolled restarting of the set of motors.

■ **power consumption:**

supply voltage	240 V AC	240 V DC
pick-up (MX)	50 VA	50 W
hold (MN)	0.6 VA	0.6 W

remote indication

■ **SD alarm switch**
❑ an indicating device which monitors the tripping of an mcb
This device offers the following
❑ a red flag trip indicator
❑ test function

■ **OF (ON/OFF) Auxiliary switch**
❑ a changeover switch which acts as an indicating or control device to monitor the "ON" or "OFF" positions of an mcb

interrupting capacity of switches (OF-SD)

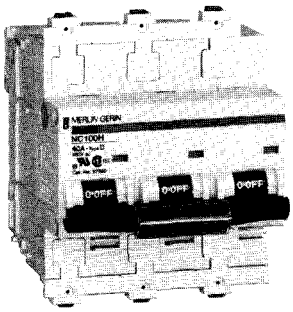
voltage (V)	(A)
277 V AC	3
240 V AC	6
130 V DC	1
48 V DC	2
24 V DC	6

■ connection: screw clamp terminal for one cable #18 to 14 AWG or two cables #18 to 16 AWG.

Dimensions: page 18

NC100H
accessories

IEC 947.2



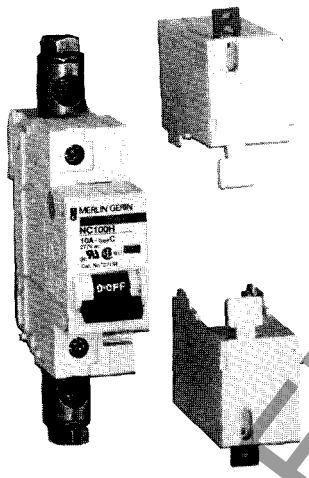
sealable terminal screw shield	cat. no.	List Price
bag of 10 strips (4 shields per strip)	**27152**	**$ 18**

■ enables total isolation of the terminal screws 1P, 2P, 3P and 4 pole.

sealable terminal cover	cat. no.	List Price
for one pole (2 covers) without connectors	**27151**	**$ 12**

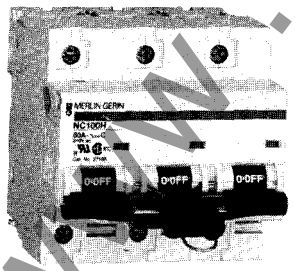
■ completely cover terminals
■ enables rear connections

note: can be mounted on 1,2,3,4 pole breakers



rear connection and terminal cover	cat. no.	List Price
with connectors	**27153**	**$ 15**

■ completely cover terminals
■ enables rear connections
■ for copper cables up to 1/0 AWG (50mm^2)



padlocking device	cat. no.	List Price
(bag of 4 pcs)	**27145**	**$ 20**

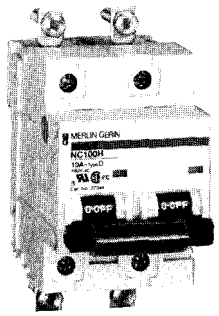
■ this device may be used to lock the circuit-breaker in "ON" or "OFF" position (for padlocks dia. max 8 mm, not supplied). The front plate or functional door can be opened with the circuit-breaker locked in "OFF" position.

NC100H
accessories

IEC 947.2

dummy module	cat. no.	List Price
mod. of 9 mm	**27123**	**$ 54**

■ to be used as a spacer when large number of breakers are mounted in a small enclosure. To increase creepage distance between auxiliaries and mcb.



screw connection	cat. no.	List Price
	27053	**$ 18**

■ enables front connection with cable lugs (screw Ø 5 mm).
The mounting of interpole barrier ref. 27001 is recommended. Also suitable for use on C60N.

front mounting kit	cat. no.	List Price
one mounting bracket	**26001**	**$ 6**

■ mounting bracket plus hardware to be used with 1, 2,3 or 4 pole breakers.

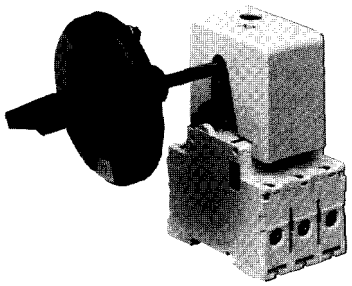
■ may be used with cat. no. 27151 sealable screw shields for extra clearance for 480V application.

■ when three pole or four pole breakers or accessories are used recommend (2) front mounting brackets.

C60/NC100H

common accessories

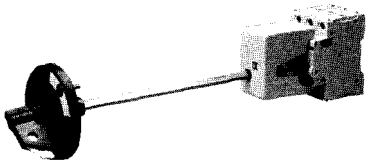
IEC 947.2

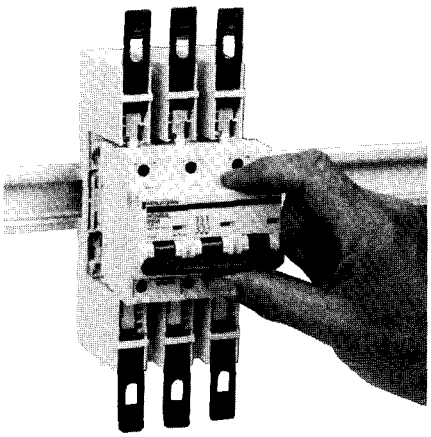


rotary handle	cat. no.	List Price
circuit-breaker operating subassembly (fixed to circuit breaker)	**27046**	**$ 45**
door interlock handle (mounted on door or hinged panel)	**27047**	**38**
fixed handle front or lateral (mounted on fixed panel)	**27048**	**33**

■ **front or lateral control** C60 or NC100H two, three and four-pole versions.
■ **degree of protection: IP54 ***
■ **installation:**
❑ on door or hinged panel for door interlock réf. 27047.
❑ on fixed front or side panel with fixed handle réf. 27048.
■ **a complete rotary handle** is made up of a circuit breaker operating subassembly and a handle cat. no. 27047 or 27048.

* equivalent : NEMA 12, 3R





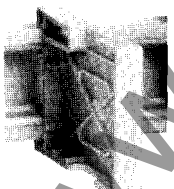
plug in base (double breaking contact type) - (C60 or NC100H to 63 A)	cat. no.	List Price
for one pole	**26996**	**$ 42**

■ for no-load isolation of a circuit protected by an mcb, with locking in "disconnected" or "isolated" position by 8 mm diameter padlocks (not supplied).

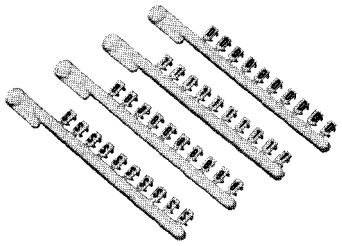
■ minimum center spacing of 200 mm between 2 rows

spacer	cat. no.	List Price
width: 9 mm/.35"	**27062**	**$ 3**

■ clips onto DIN rail
■ provides a ventilation gap to prevent overheating.
■ provides space for future breakers.

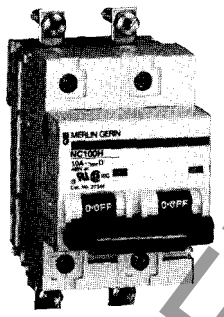


clip-on markers



dial	cat. no.	List Price
1	**27029**	**$ 18**
2	**27030**	**18**
3	**27031**	**18**
4	**27032**	**18**
5	**27033**	**18**
6	**27034**	**18**
7	**27035**	**18**
8	**27036**	**18**
9	**27037**	**18**
Letter		
A	**27003**	**18**
B	**27004**	**18**
C	**27005**	**18**
D	**27006**	**18**
E	**27007**	**18**
F	**27008**	**18**
G	**27009**	**18**
H	**27010**	**18**
I	**27011**	**18**
J	**27012**	**18**
K	**27013**	**18**
L	**27014**	**18**
M	**27015**	**18**
N	**27016**	**18**
O	**27017**	**18**
P	**27018**	**18**
Q	**27019**	**18**
R	**27020**	**18**
S	**27021**	**18**
T	**27022**	**18**
U	**27023**	**18**
V	**27024**	**18**
W	**27025**	**18**
X	**27026**	**18**
Y	**27027**	**18**
Z	**27028**	**18**
Various		
+	**27038**	**18**
-	**27039**	**18**
blank	**27040**	**18**

Identification system.
Packing : box of 250 clip-on markers.
Quantity of clip-on markers per pole:
NC100H, 4 markers per pole on the down stream terminals
C60, 6 markers per pole on the front face and 4 on the down stream terminals
Note: this identification system is compatible with TELEMECANIQUE System AB1-R and AB1-G.
Suitable also for contactors.



	cat. no.	List Price
label holders bag of 10 pieces	**27150**	**$ 18**

■ the NC100H label holders are used to identify the outgoing circuits on the front face of the handle.
(NC100H 2, 3, 4 poles)

Multi 9

Discrimination is the coordination of breakers (upstream and downstream). When a short-circuit occurs, the (mcb) immediatly upstream trips, and allows the other (mcb) to remain closed.

The table is based on engineering calculation and tests.

Downstream breaker		Upstream breaker													
		CE						CF			CJ		CJ		
		16	25	40	63	80	100	160	200	250	300	400	400	500	600
Discrimination limit	(A)	128	200	350	1100	1500	1800	7500	16000	F	F	F	F	F	F
NC100H Curve C	10														
	16														
	20														
	25														
	32														
	40														
Discrimination limit	(A)					700	900	2000	2600	4200	8200	F	F	F	F
NC100H Curve C	50														
	63														
	80														
Discrimination limit	(A)	128	200	350	1100	1800	2100	5000	F	F	F	F	F	F	F
C60N Curve C	1														
	2														
	3														
	4														
	6														
	10														
	16														
	20														
	25														
	32														
	40														
	50														
	63														

		NC 100H Curve C								
		10	16	20	25	32	40	50	63	80
Discrimination limit	(A)	75	120	150	188	240	300	375	473	600
C60N Curve C	1									
	2									
	3									
	4									
	6									
	10									
	16									
	20									
	25									
	32									
	40									
	50									
	63									

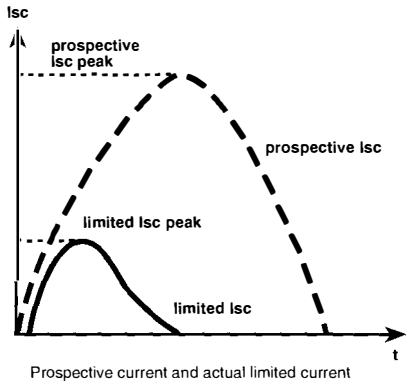
= No discrimination

= Full discrimination up to max fault level as stated

F = Full discrimination up to max interrupting capacity of downstream breaker

circuit breaker limitation capability

The limitation capability of a circuit breaker is that characteristic whereby only a current less than the prospective fault current is allowed to flow under short-circuit conditions.



Prospective current and actual limited current

This is illustrated by limitation curves which give:

■ the limited peak current in relation to the RMS value of the prospective short-circuit current (the short-circuit current being that current which would flow continuously in the absence of protection equipment),

■ the limited current stress in relation to the RMS value of the prospective short-circuit current.

■ Current limiting capability. The advanced design of the Multi 9 range provides current limitation with far better protection than conventional circuit breakers. For example, on a 6A rating with a prospective short circuit of 5000A, the current will be limited at 350A or 7%.

Installation of current limiting circuit breakers offers several advantages:

❑ **Better network protection**
Current limiting circuit breakers considerably reduce the undesirable effects of short-circuit currents in an installation.

❑ **Reduced thermal effects**
Cable heating is reduced hence longer cable life.

❑ **Reduced mechanical effects**
Electrodynamic forces reduced, thus electrical contacts are less likely to be deformed or broken.

❑ **Reduced electromagnetic effects**
Measuring equipment situated near an electrical circuit less affected.

vibrations - IEC 68.2.6

results depend on magnetic trip level:

Curve: B	sequence S3 (4g)	5 to 13Hz: ± 6mm 13 to 300Hz: 4g
Curve: C and D	sequence S6 (7g)	5 to 58Hz: ± 0.5mm 58 to 300Hz: 7g
		5 frequency sweeps per axis

shocks - IEC 68.2.27

30g
18ms
3 shocks per axis

protection of dc circuits

type	current rating AC	DC voltage				interrupting capacity KA				For DC rating increase AC current ratings by multiplier
		65V	125V	250V	500V	65V	125V	250V	500V	
C60N	1- 63A	1P	2P			10	10			1.38
NC100H	10-40A		1P	2P	4P*		10	10	10*	1.42
NC100H	50 to 80A	1P	2P	4P*		10	10	10*		1.42

* Note: IEC only

selecting a circuit breaker for a dc system

The selection fo the type of circuit breaker most suitable for protection of a DC installation depends mainly on the following criteria:

■ The rated current, which determines the rating of the equipment,

■ the rated voltage, which determines the number of poles necessary for breaking,

■ the maximum short-circuit current at the point of installation, which determines the breaking capacity,

■ the type of system:

❑ one polarity of the DC supply is grounded

❑ a center point of the DC supply is grounded

❑ insulated systems

protection of 400 Hz circuits

Circuit breakers C60 and NC100H may be used on 400 Hz systems. Short-circuit currents across the terminals of 400 hz generators generally do not exceed four times the rated current. For this reason, interrupting capacity problems are extremely rare.

■ magnetic: increase in thresholds
C60: multiplier 1.48
NC100H: multiplier 1.40
■ thermal: no variation
■ IEC

Interrupting capacities at 400 Hz.

type	number of poles	interrupting capacities		
		240V	277V	480V/277V
C60N 1-63A	1P 2P, 3P & 4P	4,000 4,000	3,000	-- 3, 000
NC100H 50-80A	1P 2P, 3P & 4P	3,000 3,000	--	
NC100H 10-40A	1P 2P, 3P & 4P	5,000 5,000	4,000 --	4,000

temperature derating

circuit breakers

derating

The reference temperature for the different circuit breakers is printed in the gray section of each table.

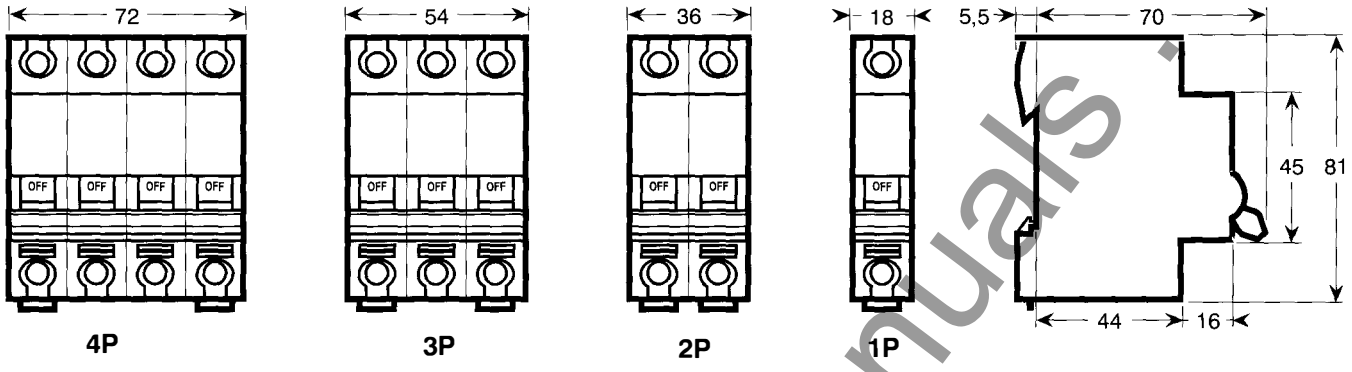
When a number of circuit breakers that operate simultaneously are mounted side by side in a small enclosure, the temperature rise inside the enclosure causes a reduction in the permissible utilization current.

Examples:
C60N rated at 20A installed on a back plate on a site where the ambient temperature is 60°C: Maximum utilization current: 20x(k)0.82 = 16.4A
NC100H rated at 80A installed in an enclosure or switchboard with an interior temperature of 50°C: Maximum utilization current: 80x(k)0.79 = 63.2A

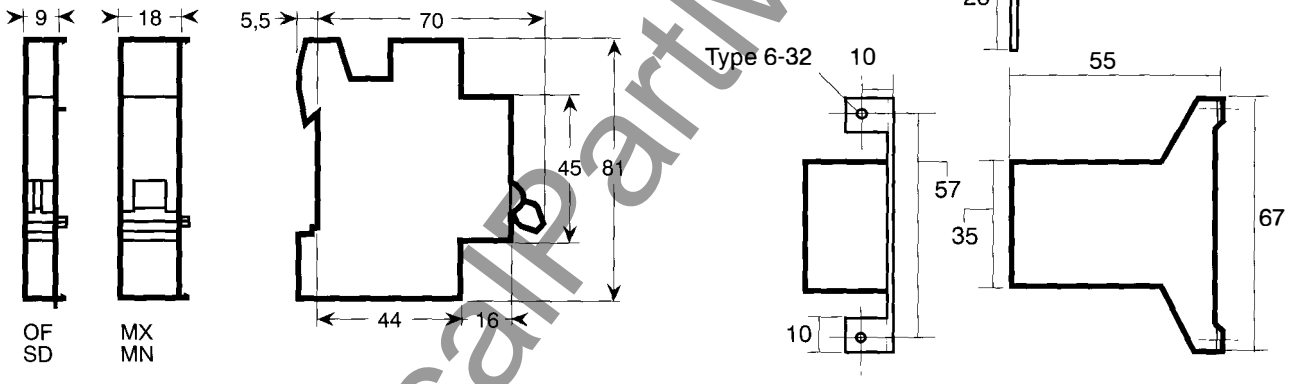
Derating Factor Table

C60N Ampere Rating	temperature in °C														
	-30	-25	-20	-15	-10	-5	0	10	20	25	30	40	50	60	70
1	1.21	1.19	1.18	1.16	1.14	1.12	1.10	1.06	1.02	1.00	0.98	0.93	0.89	0.84	0.79
2	1.21	1.19	1.18	1.16	1.14	1.12	1.10	1.06	1.02	1.00	0.98	0.93	0.89	0.84	0.79
3	1.27	1.25	1.22	1.20	1.18	1.15	1.13	1.08	1.03	1.00	0.97	0.91	0.85	0.78	0.71
4	1.25	1.23	1.21	1.19	1.17	1.15	1.12	1.07	1.03	1.00	0.97	0.92	0.86	0.80	0.73
6	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.07	1.02	1.00	0.98	0.93	0.87	0.82	0.76
8	1.29	1.26	1.24	1.22	1.19	1.17	1.14	1.09	1.03	1.00	0.97	0.91	0.84	0.76	0.68
10	1.28	1.25	1.23	1.21	1.18	1.16	1.13	1.08	1.03	1.00	0.97	0.91	0.85	0.78	0.70
13	1.26	1.24	1.21	1.14	1.15	1.25	1.12	1.07	1.03	1.00	0.97	0.92	0.86	0.79	0.72
16	1.24	1.22	1.20	1.18	1.16	1.14	1.11	1.07	1.02	1.00	0.98	0.93	0.87	0.81	0.75
20	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.07	1.02	1.00	0.98	0.93	0.87	0.82	0.76
25	1.24	1.22	1.20	1.18	1.16	1.14	1.11	1.07	1.02	1.00	0.98	0.93	0.87	0.81	0.75
32	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.07	1.02	1.00	0.98	0.93	0.88	0.82	0.77
40	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.07	1.02	1.00	0.98	0.93	0.88	0.82	0.76
50	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.07	1.02	1.00	0.98	0.93	0.88	0.82	0.76
63	1.28	1.25	1.23	1.21	1.18	1.16	1.13	1.08	1.03	1.00	0.97	0.91	0.85	0.78	0.70
NC100H															
10	1.36	1.33	1.30	1.27	1.4	1.21	1.18	1.11	1.04	1.00	0.96	0.88	0.78	0.68	0.56
16	1.30	1.27	1.25	1.22	1.2	1.17	1.15	1.09	1.03	1.00	0.97	0.90	0.83	0.75	0.66
20	1.32	1.29	1.26	1.24	1.21	1.18	1.15	1.10	1.03	1.00	0.97	0.89	0.82	0.73	0.63
25	1.31	1.29	1.26	1.23	1.22	1.18	1.15	1.09	1.03	1.00	0.97	0.90	0.82	0.74	0.64
32	1.34	1.31	1.28	1.25	1.22	1.19	1.16	1.10	1.04	1.00	0.96	0.89	0.80	0.71	0.60
40	1.32	1.29	1.27	1.24	1.21	1.19	1.16	1.10	1.03	1.00	0.97	0.89	0.81	0.73	0.60
50	1.41	1.38	1.35	1.31	1.28	1.24	1.21	1.13	1.04	1.00	0.95	0.85	0.74	0.60	0.43
63	1.38	1.35	1.32	1.29	1.26	1.22	1.19	1.12	1.04	1.00	0.96	0.87	0.76	0.65	0.50
80	1.35	1.32	1.29	1.26	1.23	1.20	1.17	1.11	1.04	1.00	0.96	0.88	0.79	0.69	0.58

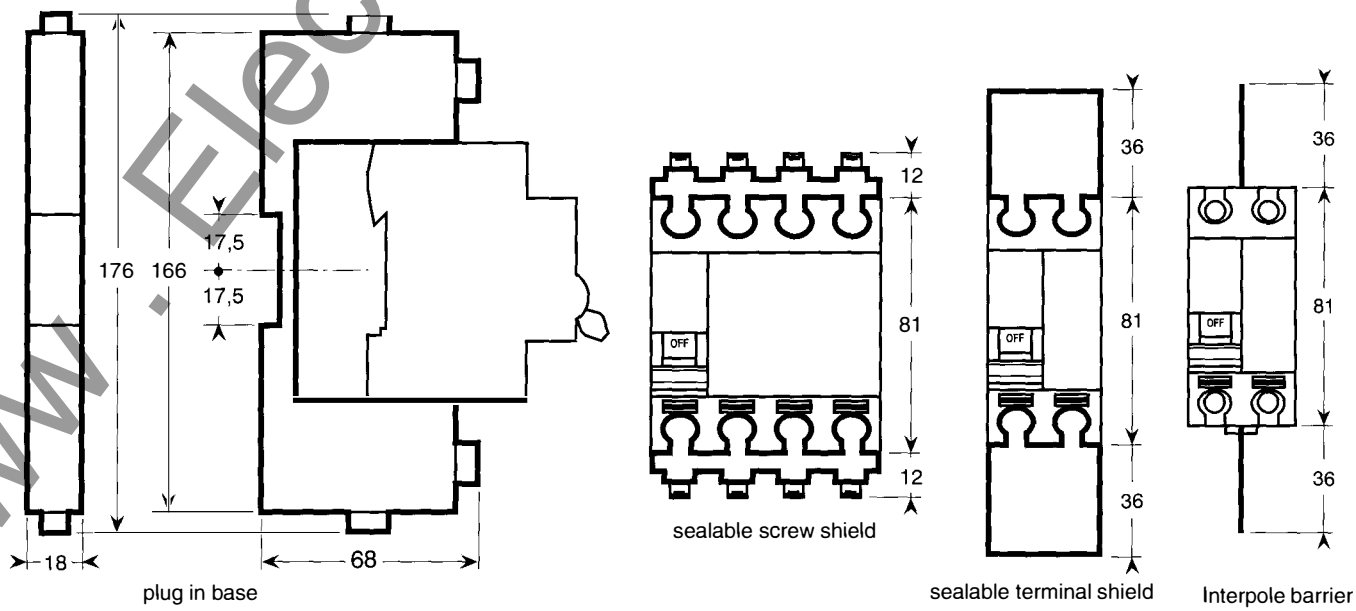
C60 mcb



C60 auxiliaries



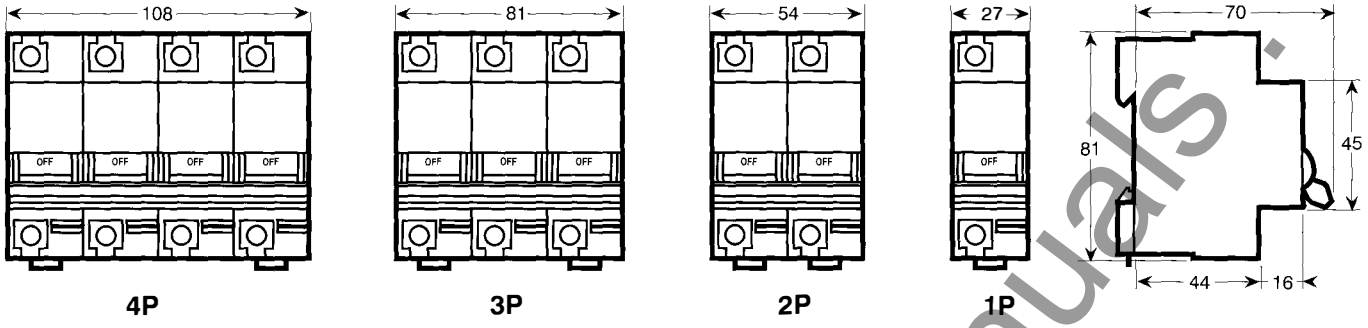
C60 accessories



NC100H

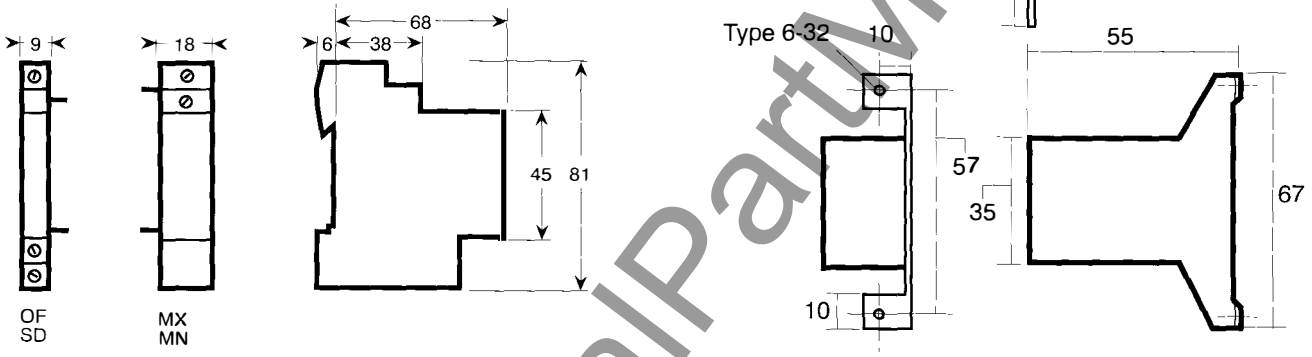
dimensions(mm)

NC100H mcb



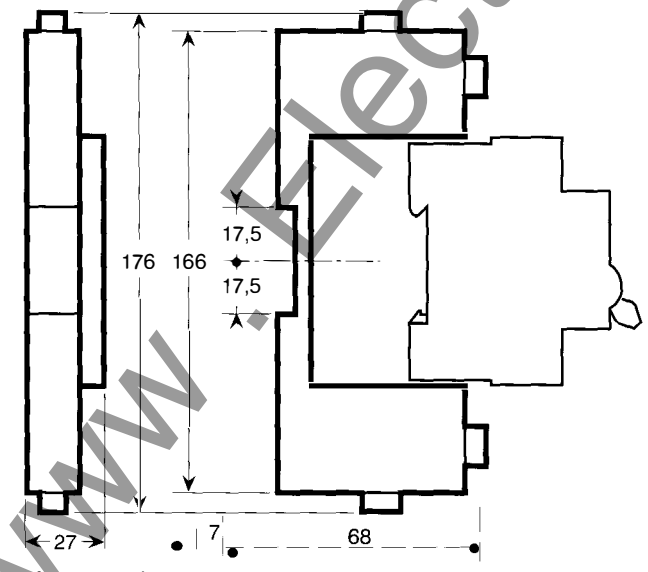
4P 3P 2P 1P

NC100H auxiliaries

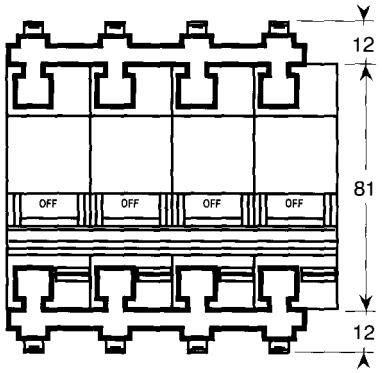


front mounting bracket

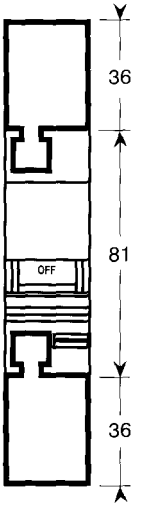
NC100H accessories



surface mounting
isolatable back plate



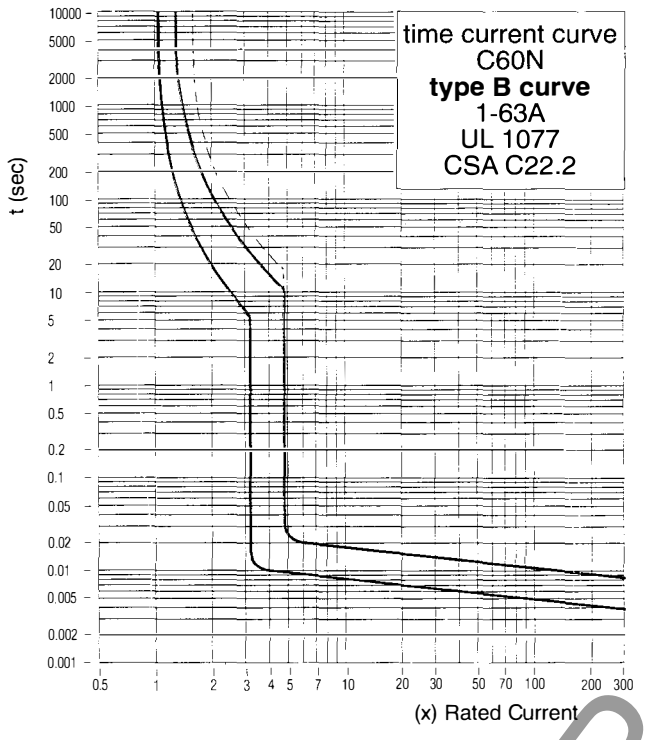
sealable screw shield



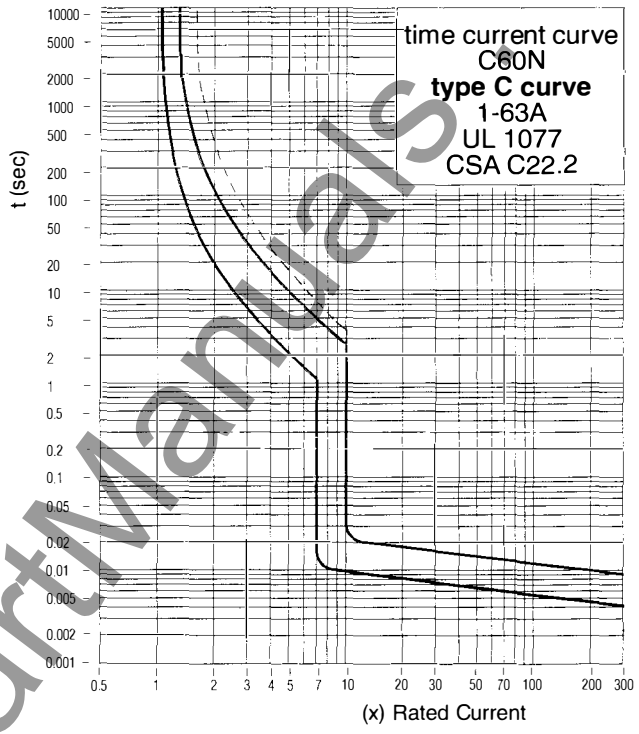
sealable
terminal shield

C60N*

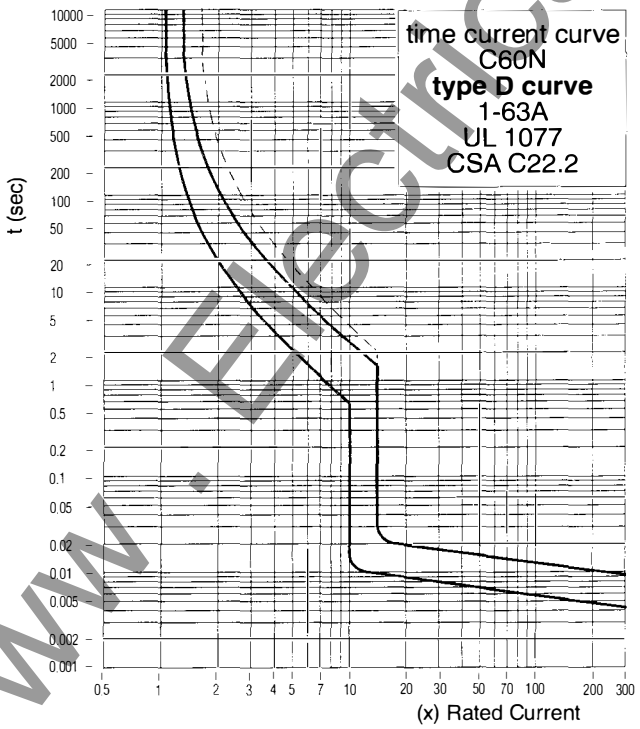
Curve B 1 - 63A



Curve C 1 - 63A



Curve D 1 - 63A

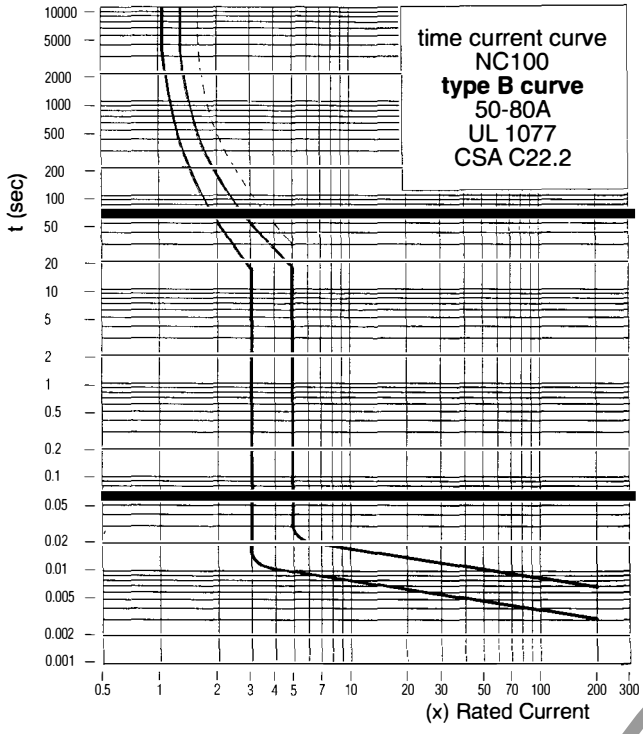


**C60L time current tripping curves are available upon request.*

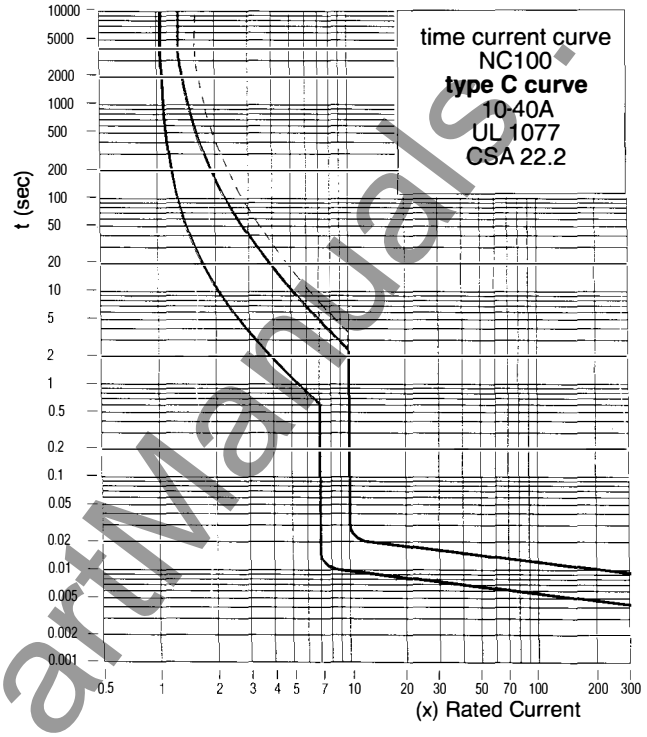
NOTE: Dotted line is the tripping limit of single pole of a multi-pole breaker.

NC100H

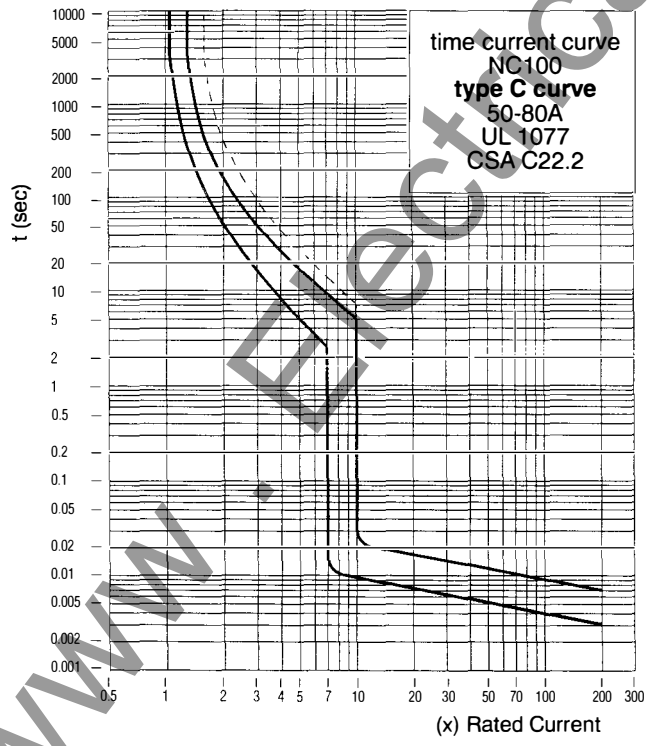
Curve B 50 - 80A



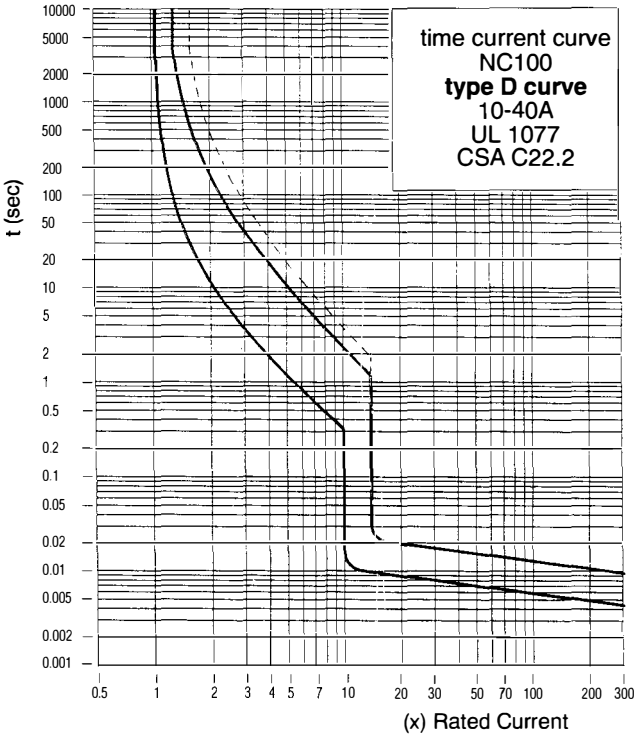
Curve C 10 - 40A



Curve C 50 - 80A



Curve D 10 - 40A

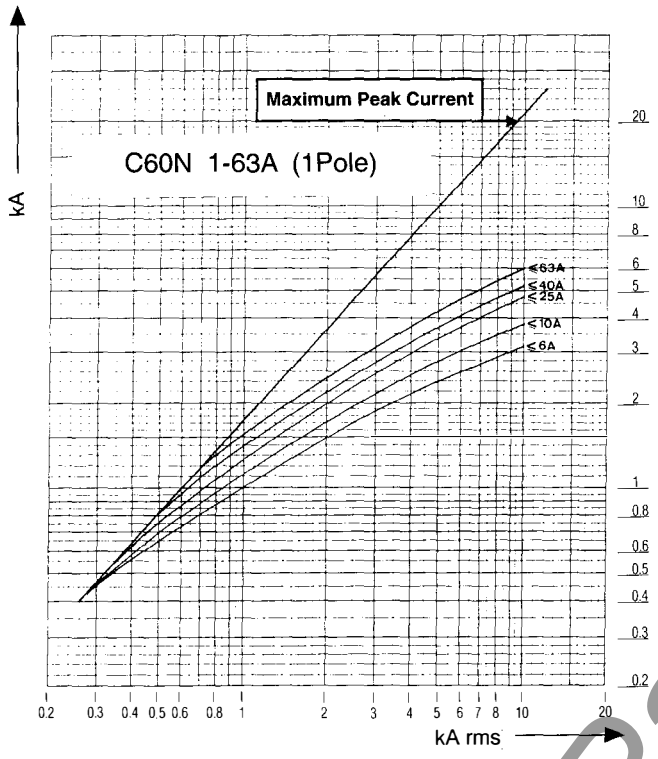


NOTE: Dotted line is the tripping limit of single pole of a multi-pole breaker.

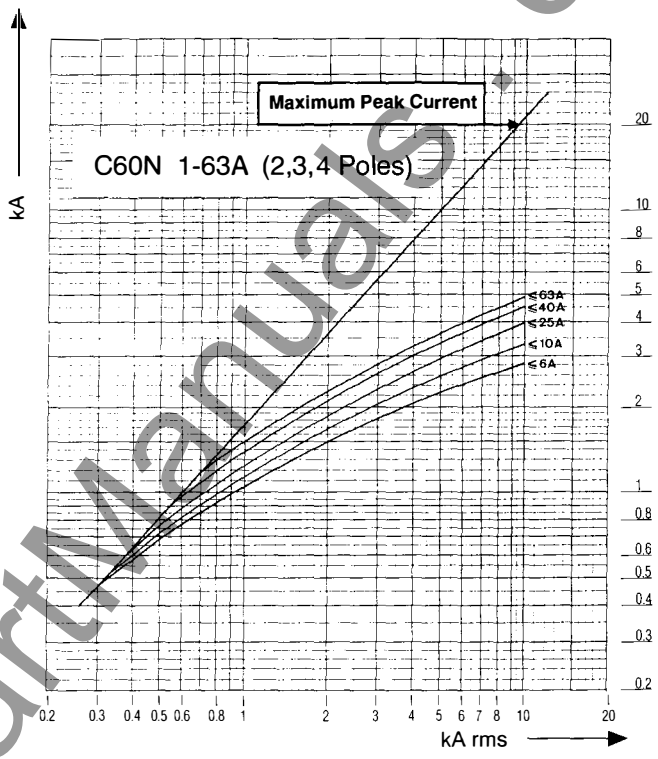
C60N

240V
277V
480V

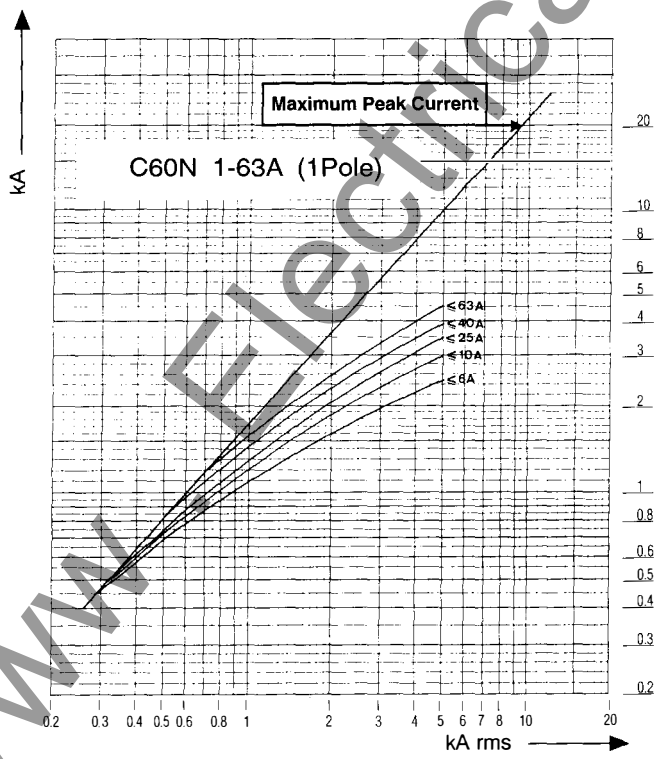
Current Limitation: 240V
C60N: 1pole



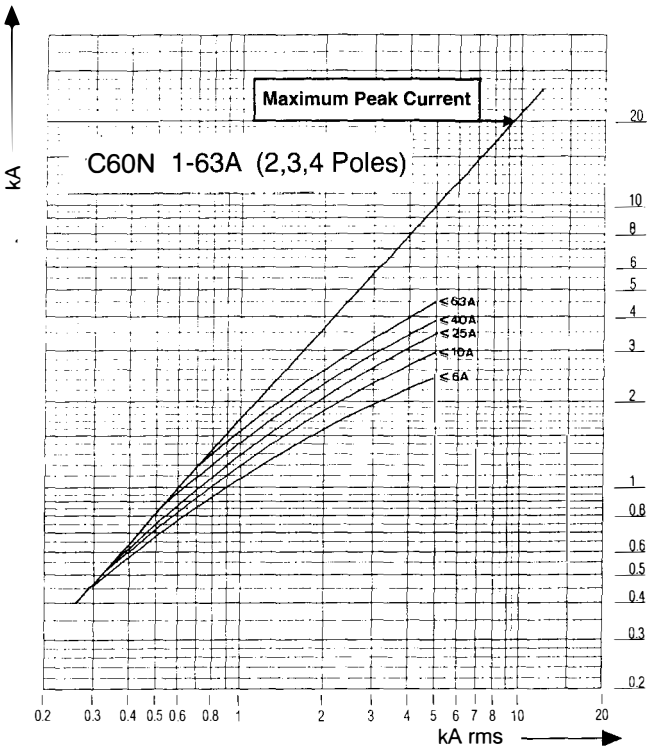
Current Limitation: 240V
C60N: 2,3,4 poles



Current limitation: 277V
C60N: 1 pole



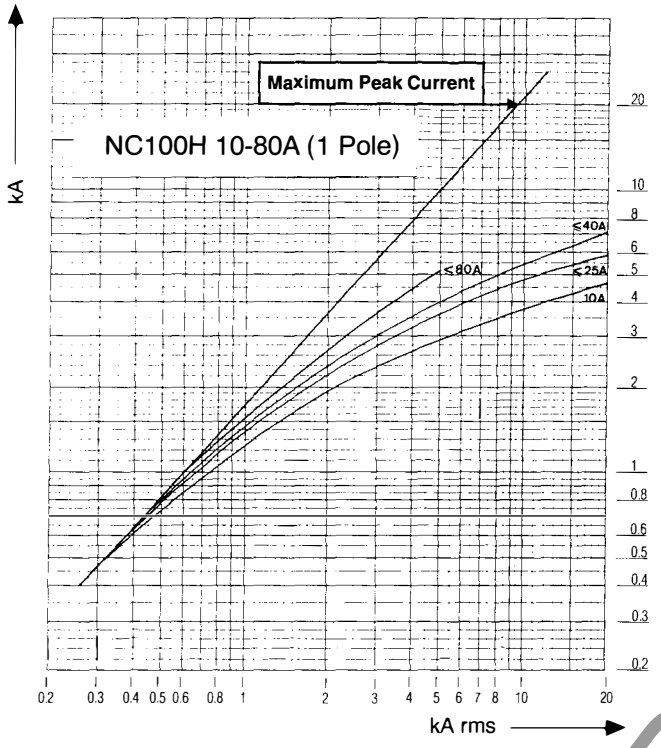
Current limitation: 480V
C60N: 2,3,4 poles



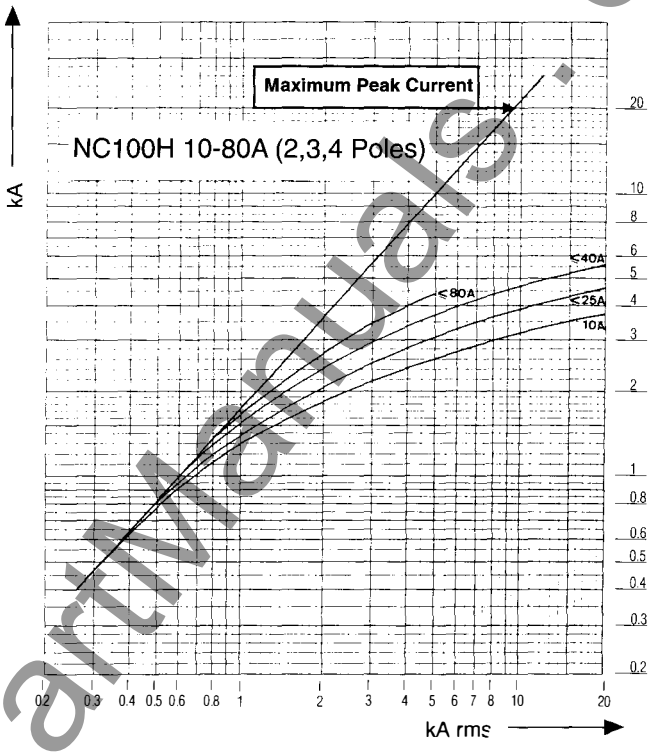
NC100H

240V
277V
480V

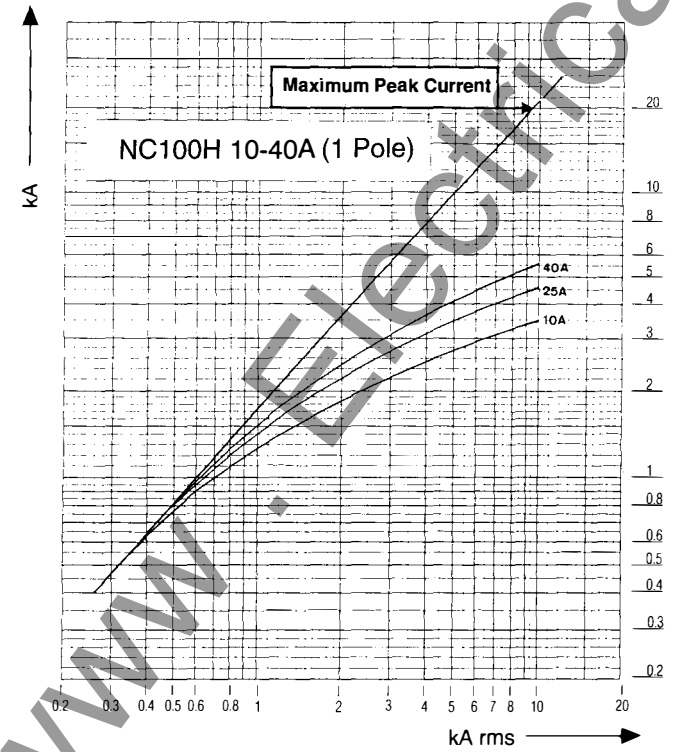
Current Limitation: 240V
NC100: 1pole



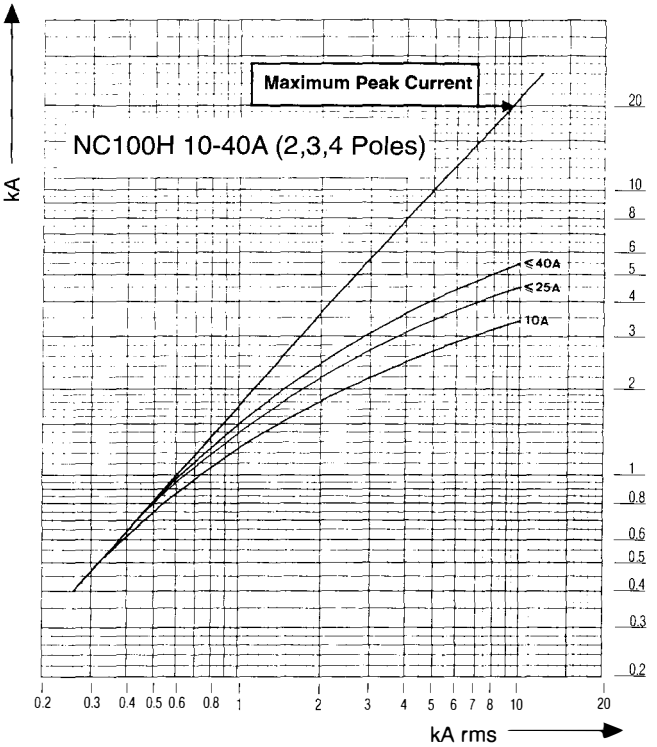
Current Limitation: 240V
NC100: 2,3,4 poles



Current limitation: 277V
NC100: 1 pole



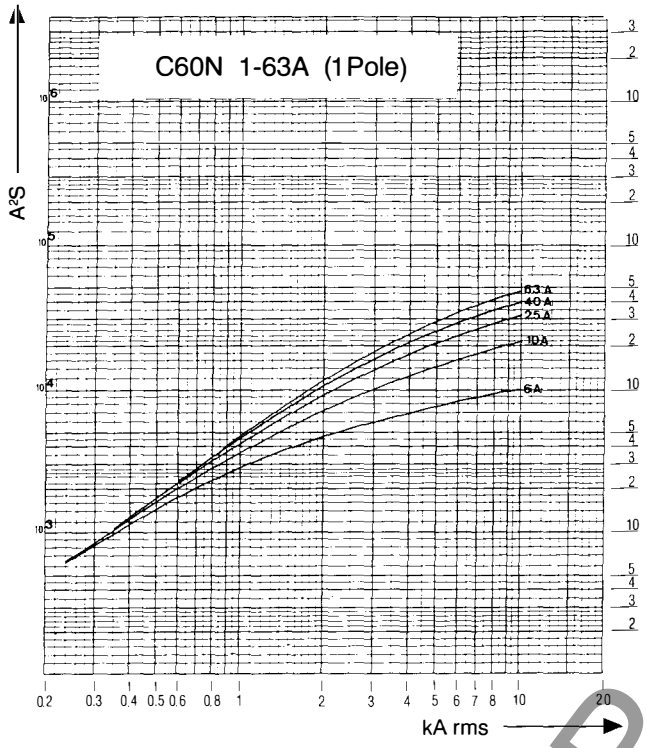
Current limitation: 480V
NC 100: 2,3,4 poles



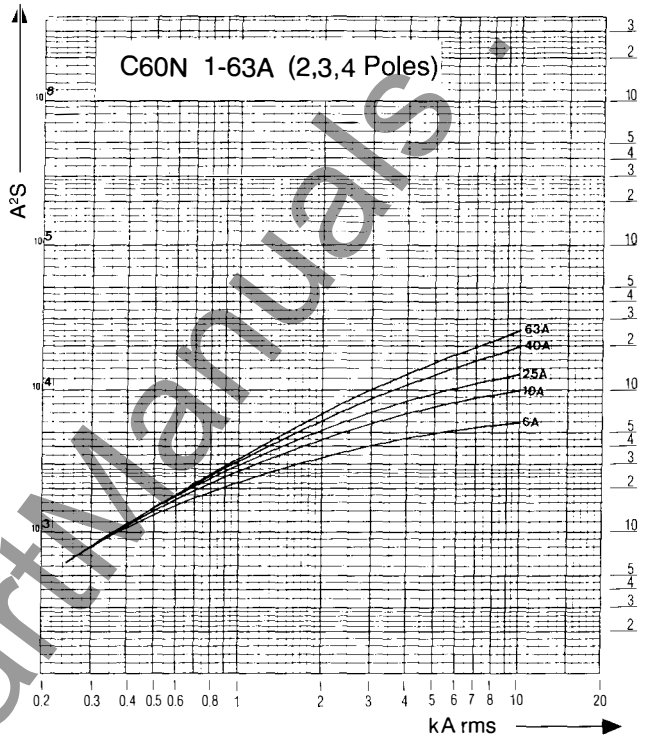
C60N

240V
277V
480V

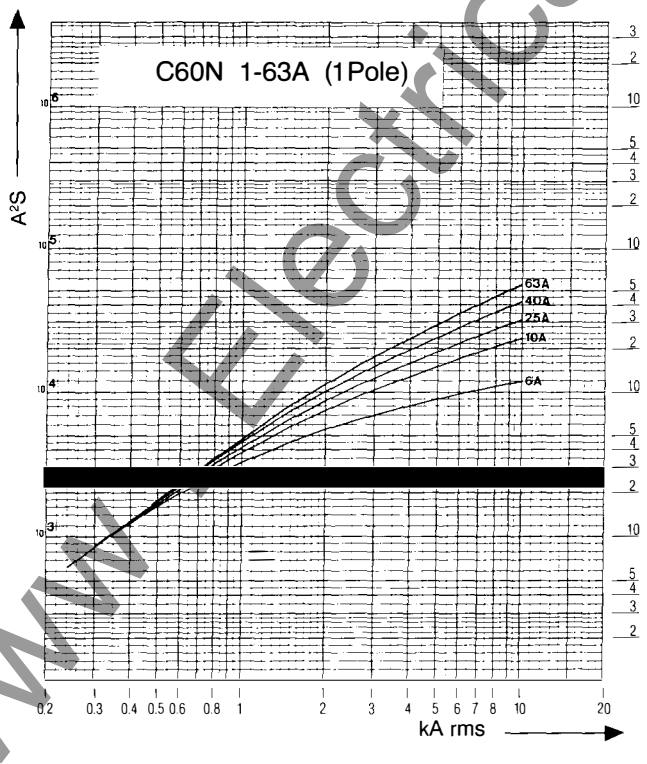
rated voltage: 240V
C60N: 1pole



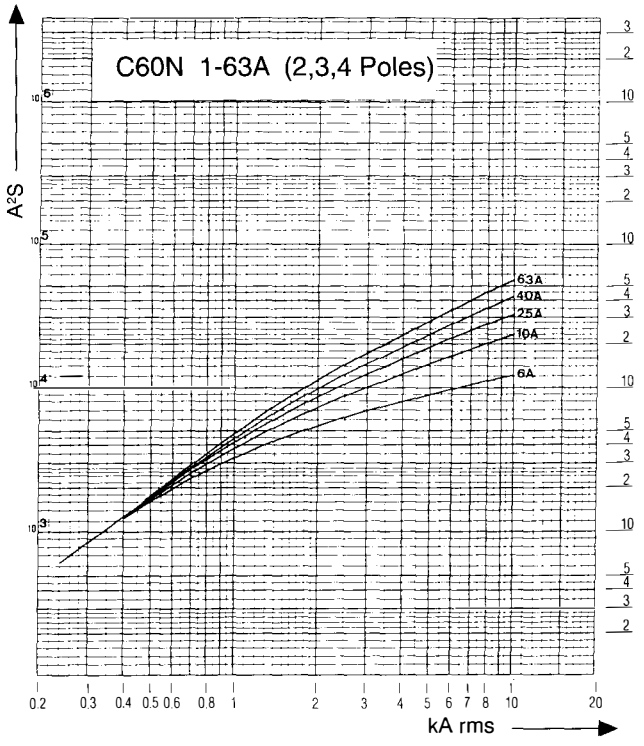
rated voltage: 240V
C60N: 2,3,4 poles



rated voltage: 277V
C60N: 1 pole



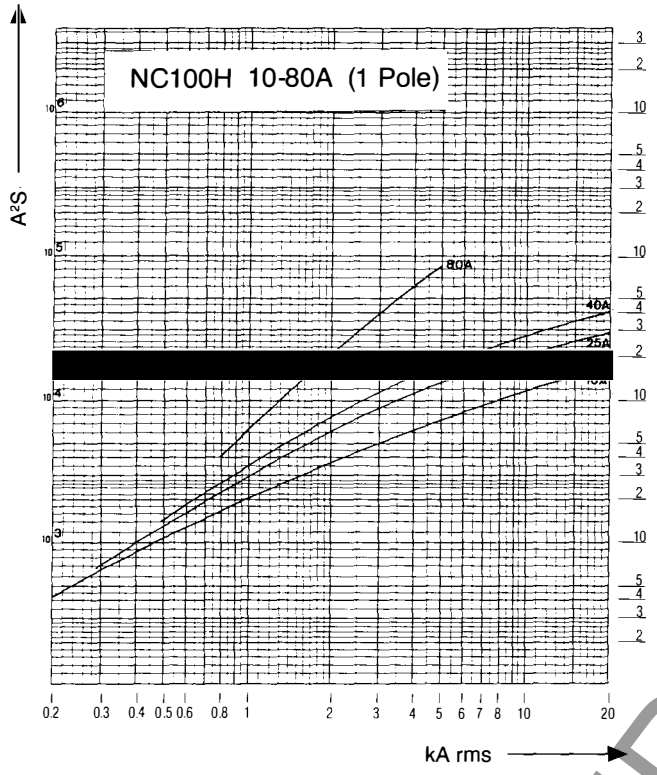
rated voltage: 480V
C60N: 2,3,4 poles



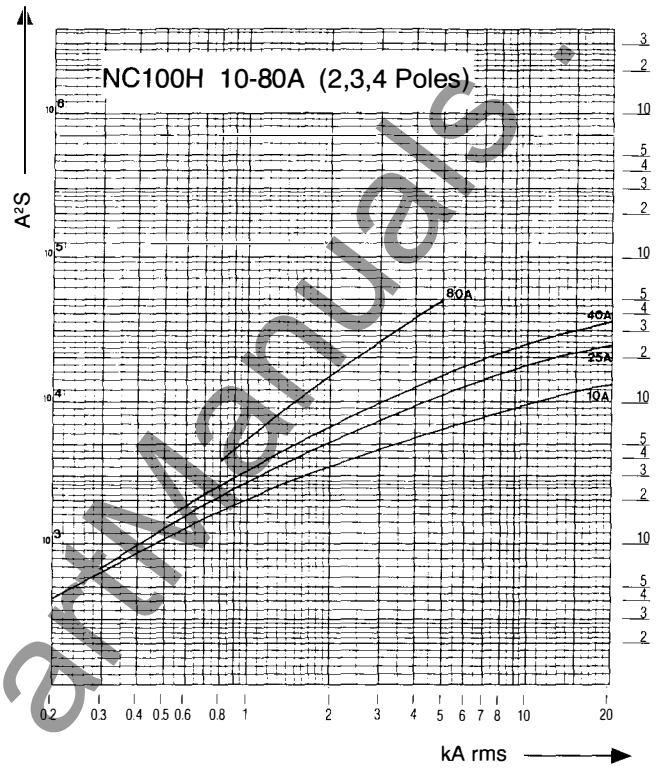
NC100H

240V
277V
480V

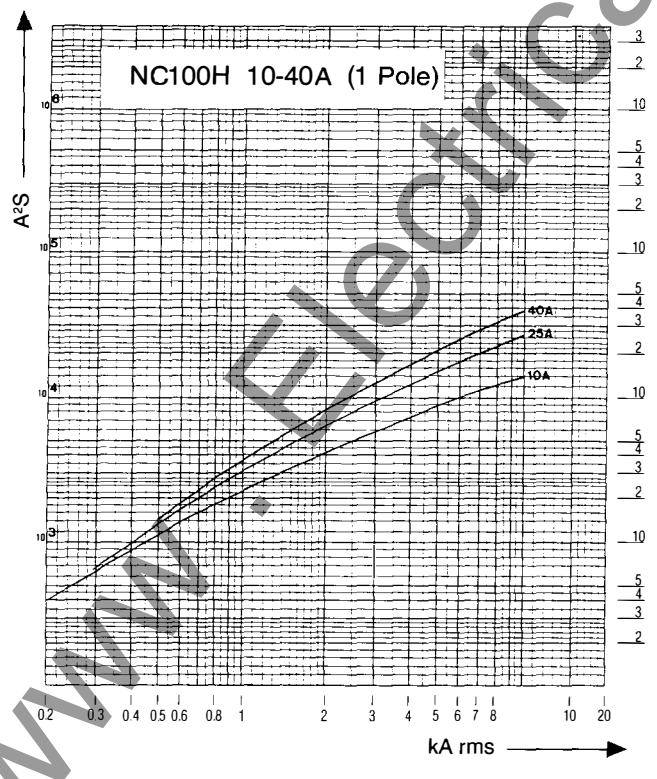
rated voltage: 240V
NC100: 1pole



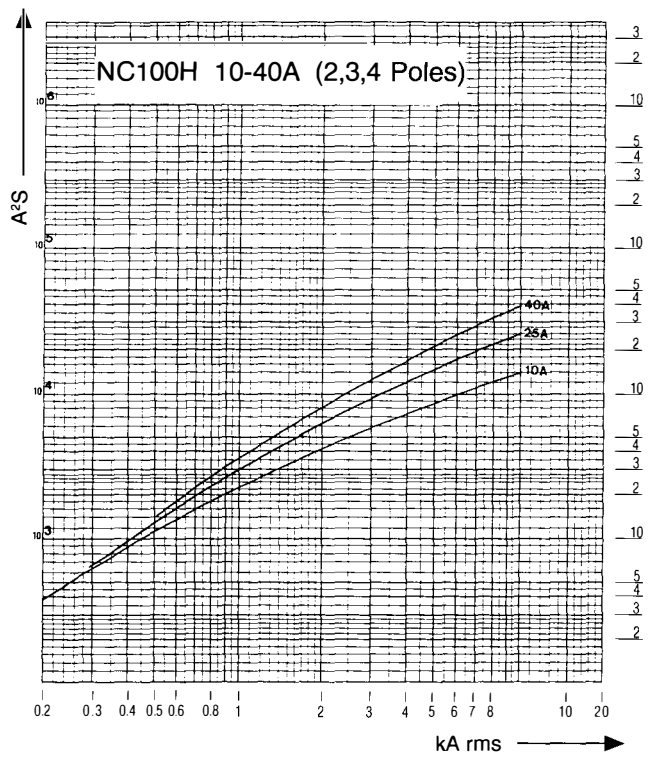
rated voltage: 240V
NC100: 2,3,4 poles



rated voltage: 277V
NC100: 1 pole



rated voltage: 480V
NC 100: 2,3,4 poles



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USM90492

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