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MULTI 9™ System Catalog

Class 0860





CONTENTS **Pages**

Introduction . . . 2
Markings . . . 4
UL Recognized C60 and NC100 Supplementary Protectors . . . 5
IEC Rated DPN-N Residual Current Circuit Breakers . . . 19
IEC Rated C60 and NC100 Circuit Breakers . . . 20
ID Residual Current Switches . . . 45
I Switches . . . 47
CM Changeover Switches . . . 48
PE Surge Arresters . . . 49
CH Hour Counter and CI Impulse Counter . . . 51
V Type Signal Lamps . . . 52
BP Push Buttons . . . 53
Enclosures . . . 54
Dimensions . . . 58
Time/Current Curves . . . 69
Current Limiting Curves . . . 74
Applications . . . 83
Index . . . 92

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Contents **Page**

Introduction 2
Markings 4

UL Recognized C60N Supplementary Protectors 5
UL Recognized C60N Electrical Accessories 7
UL Recognized C60N Accessories 9
UL Recognized NC100H Supplementary Protectors 12
UL Recognized NC100H Electrical Accessories 14
UL Recognized NC100H Accessories 16

IEC Rated DPN-N Residual Current Circuit Breakers 19
IEC Rated C60N/H/L Circuit Breakers 20
IEC Rated C60 Vigi Module for Ground-fault Protection 25
IEC Rated C60 Electrical Accessories 27
IEC Rated C60 Accessories 31
IEC Rated C32H-DC Circuit Breakers 34
IEC Rated NC100H/LS/LH Circuit Breakers 35
IEC Rated NC100 Vigi Module for Ground-fault Protection 38
IEC Rated NC100 Electrical Accessories 40
IEC Rated NC100 Accessories 42

IEC Rated ID Residual Current Switches 45
IEC Rated I Switches 47
IEC Rated CM Changeover Switches 48
IEC Rated PE Surge Arresters 49
IEC Rated CH Hour Counter and CI Impulse Counter 51
V Type Signal Lamps 52
BP Push Buttons 53

MINI PRAGMA™ DIN Type Enclosures 54
MINI PRAGMA™ Weatherproof Type Enclosures 55
PRAGMA F™ DIN Type Enclosures 56

Dimensions 58

Time/Current Curves 69
Current Limiting Curves 74

Applications 83

Index 92

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The MULTI 9™ modular system of miniature circuit breakers, accessories and installation equipment is the most complete offering in the world for this class of equipment. The MULTI 9 system of products is used worldwide and is available in more than 120 countries. All MULTI 9 miniature circuit breakers include line and load side box lug terminals (pressure plate type) suitable for use with multiple wires. Each MULTI 9 module is 0.35 in. (9 mm) wide and is designed to be mounted on a 1.38 in. (35 mm) DIN rail.

MULTI 9 supplementary protectors and miniature circuit breakers have current-limiting capability. The advanced design of the MULTI 9 system provides current limitation with far better protection than conventional circuit breakers. Faster electrical separation from a faulty component on the system can reduce damage.

Each C60N and NC100H miniature circuit breaker has an endurance of 20,000 operation cycles, voltage withstand of 6000 V impulse rating, and is suitable for reverse feeding.

Depending on the device ratings, terminals are available for use with wire up to #1 AWG (50 mm^2). Screw-type terminals are available as accessories.

Up to four accessories can be mounted on each supplementary protector or miniature circuit breaker. UL and CSA approved field-installable electrical auxiliaries for both C60N and NC100H supplementary protectors are: Shunt trip with auxiliary switch (MX+OF), auxiliary switch (OF), alarm switch (SD) and undervoltage release (MN).

Applications

MULTI 9™ products are intended for use as supplementary protectors to provide overcurrent protection within appliances or other electrical equipment where branch circuit overcurrent protection is already provided or is not required.

Potential applications include: computers, medical equipment, transformers, power supplies and many other types of electrical equipment.

UL Recognized Supplementary Protectors

	Trip Curves			Rating (A)	Max. Voltage (V)	Interrupting Rating at 480Y/277 Vac (kA)	Page
	B	C	D			3 4.5 5 6 7.5 10 15 20 25 36 40 50	
C60N	■	■	■	0.5–63	480Y/277 Vac		5
NC100H	■	■	■	10–80	480Y/277 Vac		12

As per UL 1077 and CSA 22.2 no. 235

IEC Rated Miniature Circuit Breakers

	Trip Curves						Rating (A)	Max. Voltage (V)	Interrupting Rating at 415 Vac (kA)	Page
	Z	B	C	D	K	MA			3 4.5 5 6 7.5 10 15 20 25 36 40 50	
DPN-N		■	■				1–40	230 Vac		19
C60N		■	■	■			0.5–63	440 Vac		20
C60H		■	■	■			0.5–63	440 Vac		20
C60L	■	■	■		■		0.5–25	440 Vac		20
C60L	■	■	■		■		32–40	440 Vac		20
C60L		■	■				50–63	440 Vac		20
C60L-MA						■	1.6–25	440 Vac		21
C60L-MA						■	40	440 Vac		21
C32H-DC			■				1–40	127 Vdc (1P)		34
C32H-DC			■				1–40	250 Vdc (2P)		34
NC100H		■	■	■			10–125	440 Vac		35
NC100LS		■	■	■			10–63	440 Vac		35
NC100LH		■	■				10–63	440 Vac		35

As per IEC 898
As per IEC 947-2

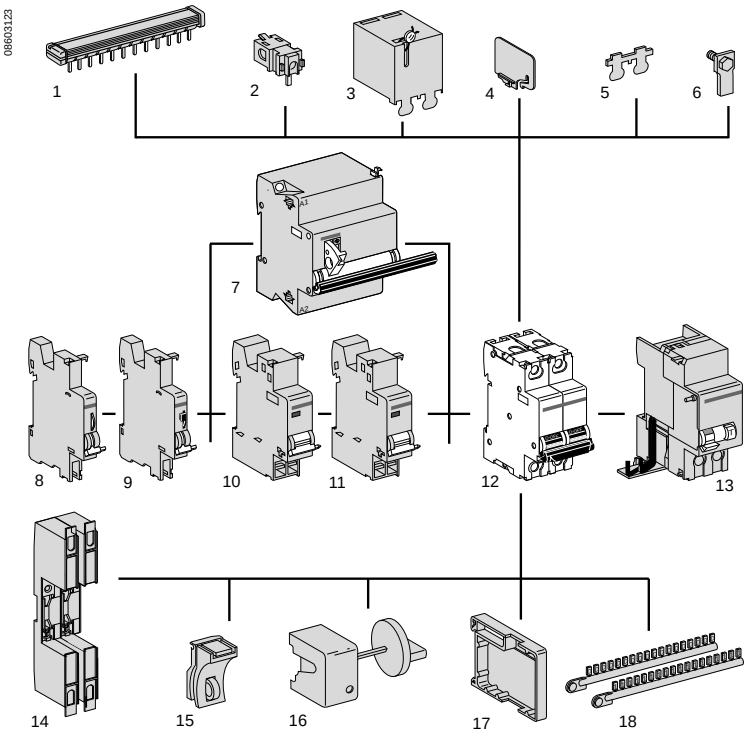
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Advantages

- **Panel Space Savings**—MULTI 9™ products are compact. Width per pole (each pole = two modules) is 0.71 in. (18 mm) for the C60N miniature circuit breaker or supplementary protector, and 1.06 in. (27 mm) for the NC100H miniature circuit breaker or supplementary protector.
- **Ease of Installation**—MULTI 9 products use a 1.38 in (35 mm) DIN-rail mounting system.
- **System Flexibility—**MULTI 9 supplementary protectors and miniature circuit breakers have a complete line of field-installable accessories.

1. Comb Bus Bar
2. Connector
3. Terminal Cover
4. Interphase Barrier
5. Terminal Screw Shield
6. Crimped Lug Connection
7. Motor Operator
8. Alarm Switch
9. Auxiliary Switch
10. Shunt Trip
11. Undervoltage Release
12. Circuit Breaker
13. Vigi Module
14. Plug-in Base
15. Padlock Attachment
16. Rotary Handle
17. Spacer
18. Identification System



- **Better Protection**—MULTI 9 supplementary protectors and miniature circuit breakers are current limiting, providing faster separation of the component from the fault, thereby reducing system damage.
- **Elimination of Nuisance Tripping**—MULTI 9 supplementary protectors and miniature circuit breakers have four trip characteristics from which to choose. They are available with different trip characteristics to provide greater flexibility in custom application to meet system needs. Overload curves are calibrated to an ambient temperature of 77°F (25°C) for type C60N and NC100H for both UL Recognition and CSA Certification.

  B Curve—Instantaneous magnetic trip between 3.2 and 4.8 x I_n (rated current) for computers and electronic and generator applications.

  C Curve—Instantaneous magnetic trip between 7 and 10 x I_n (rated current) for general purpose applications.

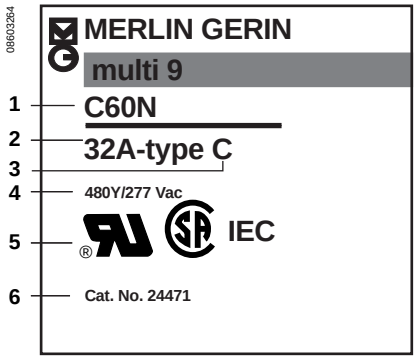
  D Curve—Instantaneous magnetic trip between 10 and 14 x I_n (rated current) for motors, transformers, and similar applications.

  MA Curve—Instantaneous magnetic only trip at 12 x I_n (rated current) for motor circuit protection. IEC Rated; not UL Recognized.

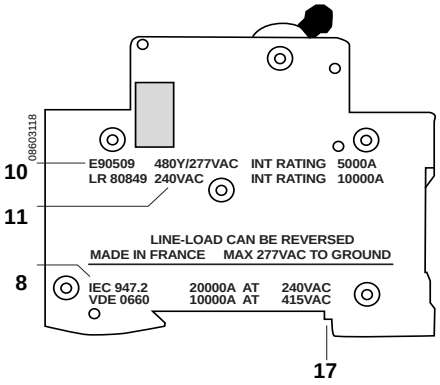
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UL Recognized Supplementary Protectors

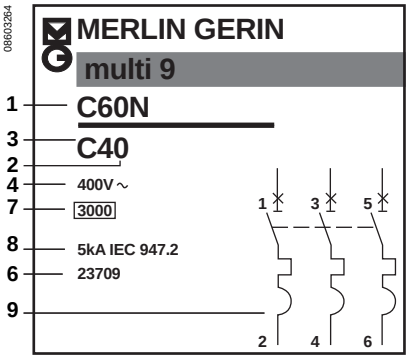


Face Markings

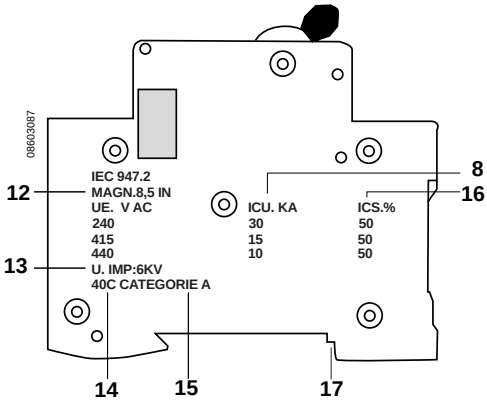


Side Markings

IEC Rated Miniature Circuit Breakers



Face Markings



Side Markings

1. Supplementary Protector or Circuit Breaker Type
2. Ampere Rating
3. Trip Curve
4. Voltage
5. Standards Marks
6. Catalog Number
7. Interrupting Ratings (I_{cn}) as per IEC 898
8. Interrupting Ratings (I_{cu}) as per IEC 947-2
9. Symbol of IEC Rated Circuit Breakers
10. UL and CSA File Numbers
11. Interrupting Ratings as per UL 1077
12. Magnetic Settings
13. Impulse Voltage
14. Temperature of Reference
15. Category as per IEC 947-2 (A means that the circuit breaker is not intended to offer a short-time withstand)
16. Interrupting Rating (I_{cs}) as per IEC 947-2
17. CE Mark on Bottom of Circuit Breaker

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Standard Features

- Fast closing: Allows increased withstand to the high inrush currents of some loads
- Trip-free mechanism: Contacts cannot be held in the on position when the supplementary protector is tripped automatically
- Isolation with positive break indication—Green strip on the circuit breaker operating handle indicates that all poles open
- Number of operating cycles (O–C): 20,000
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C).
- Degree of Protection:
  - Case: IP40 as per IEC 529
  - Terminals: IP20
- Temperature:
  - Operation: 23 to 140°F (–5 to 60°C)
  - Storage: –40 to 212°F (–40 to 100°C)

Interrupting Ratings

Rating (A) 77°F/25°C	Number of Poles	Voltage (Vac/Vdc)	Interrupting Rating (A)	
			UL 1077	IEC 947-2
0.5–63	1P	240 Vac	10,000	10,000
	2P/3P/4P	240 Vac	10,000	20,000
	1P	277 Vac	5,000	—
		415 Vac	—	3,000 (1)
	2P/3P/4P	415 Vac	—	10,000
		440 Vac	—	6,000
		480Y/277 Vac	5,000	—
	1P	65 Vdc	10,000	10,000
	2P	125 Vdc	10,000	10,000

(1) Single-pole interrupting rating for IT type European grounding system (Insulated neutral—double fault).

Compliance with Standards

- UL 1077 Supplementary Protectors File #E90509
- CSA C22.2 No. 235-M89 Supplementary Protectors File #LR80849
- IEC 947-2, VDE 0660
- CE Marked

Time-Current Curves

B Curve—Overcurrent protection for sensitive equipment (computers, electronic devices etc.):
- Ratings: 1–63 A set at 77°F (25°C)
- Tripping curve: The magnetic release operates between 3.2 and 4.8 times ampere rating

C Curve—Overcurrent protection for all application types:
- Ratings: 0.5–63 A set at 77°F (25°C)
- Tripping curve: The magnetic releases operates between 7 and 10 times ampere rating

D Curve—Overcurrent protection for loads with high inrush currents (motors, transformers etc.):
- Ratings: 1–63 A set at 77°F (25°C)
- Tripping curve: The magnetic releases operates between 10 and 14 times ampere rating

Weight (oz./g)

Type	1P	2P	3P	4P
C60N	3.88/110	7.75 /220	11.64/330	15.52/440

Connection

- 0.5–25 A: (#18–#4 AWG) 1–25 mm^2 cables
- 30–63 A: (#18–#2 AWG) 1–35 mm^2 cables

Ground-fault Protection

- IEC Rated; not UL Recognized (see page 25)

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B Curve—C60N Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1	MG24110	MG24125	MG24140	MG24155
1.2	MG17402	MG17432	—	—
1.5	MG17403	MG17433	—	—
2	MG24111	MG24126	MG24141	MG24156
3	MG24112	MG24127	MG24142	MG24157
4	MG24113	MG24128	MG24143	MG24158
5	MG17404	MG17434	—	—
6	MG24114	MG24129	MG24144	MG24159
7	MG17405	MG17435	—	—
8	MG24115	MG24130	MG24145	MG24160
10	MG24116	MG24131	MG24146	MG24161
13	MG24117	MG24132	MG24147	MG24162

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
15	MG17406	MG17436	MG17461	—
16	MG24118	MG24133	MG24148	MG24163
20	MG24119	MG24134	MG24149	MG24164
25	MG24120	MG24135	MG24150	MG24165
30	MG17407	MG17437	MG17462	—
32	MG24121	MG24136	MG24151	MG24166
35	MG17408	MG17438	MG17463	—
40	MG24122	MG24137	MG24152	MG24167
50	MG24123	MG24138	MG24153	MG24168
60	MG17409	MG17439	MG17464	—
63	MG24124	MG24139	MG24154	MG24169

C Curve—C60N Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	MG17411	—	—	—
1	MG24425	MG24442	MG24459	MG24476
1.2	MG17412	MG17442	—	—
1.5	MG17413	MG17443	—	—
2	MG24426	MG24443	MG24460	MG24477
3	MG24427	MG24444	MG24461	MG24478
4	MG24428	MG24445	MG24462	MG24479
5	MG17414	MG17444	—	—
6	MG24430	MG24447	MG24464	MG24481
7	MG17415	MG17445	—	—
8	MG24431	MG24448	MG24465	MG24482
10	MG24432	MG24449	MG24466	MG24483

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
13	MG24433	MG24450	MG24467	MG24484
15	MG17416	MG17446	MG17466	—
16	MG24434	MG24451	MG24468	MG24485
20	MG24435	MG24452	MG24469	MG24486
25	MG24436	MG24453	MG24470	MG24487
30	MG17417	MG17447	MG17467	—
32	MG24437	MG24454	MG24471	MG24488
35	MG17418	MG17448	MG17468	—
40	MG24438	MG24455	MG24472	MG24489
50	MG24439	MG24456	MG24473	MG24490
60	MG17419	MG17449	MG17469	—
63	MG24440	MG24457	MG24474	MG24491

D Curve—C60N Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	MG17421	—	—	—
1	MG24500	MG24516	MG24532	MG24548
1.2	MG17422	MG17452	—	—
1.5	MG17423	MG17453	—	—
2	MG24501	MG24517	MG24533	MG24549
3	MG24502	MG24518	MG24534	MG24550
4	MG24503	MG24519	MG24535	MG24551
5	MG17424	MG17454	—	—
6	MG24504	MG24520	MG24536	MG24552
7	MG17425	MG17455	—	—
8	MG24505	MG24521	MG24537	MG24553
10	MG24506	MG24522	MG24538	MG24554

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
13	MG24507	MG24523	MG24539	MG24555
15	MG17426	MG17456	MG17471	—
16	MG24508	MG24524	MG24540	MG24556
20	MG24509	MG24525	MG24541	MG24557
25	MG24510	MG24526	MG24542	MG24558
30	MG17427	MG17457	MG17472	—
32	MG24511	MG24527	MG24543	MG24559
35	MG17428	MG17458	MG17473	—
40	MG24512	MG24528	MG24544	MG24560
50	MG24513	MG24529	MG24545	MG24561
60	MG17429	MG17459	MG17474	—
63	MG24514	MG24530	MG24546	MG24562

NOTE: Width of one module = 0.354 in. (9 mm).



1P



2P



3P



4P

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Remote Tripping

Remote tripping is possible by means of an MX shunt trip or MN undervoltage release. A tripped supplementary protector is indicated by a red indicator flag on the front panel.

- ■ MX + OF shunt trip—When energized, trips the associated supplementary protector
- □ Equipped with a cut-off switch
- □ Equipped with an O + F switch that indicates the "open" or "closed" position of the supplementary protector
- ■ MN undervoltage release—When the voltage drops to 70–35% of the supply voltage, the associated supplementary protector trips and is prevented from reclosing until the supply voltage is restored
- □ Complies with UL, CSA and IEC Standards
- □ Uses emergency stop via push button
- □ Uses safety feature on circuit supplying several machines preventing uncontrolled restarting of the motors
- ■ MN Ⓢ time-delayed undervoltage release:
- □ Undervoltage release which controls the opening of the associated supplementary protector
- □ Allows a 0.5 second time delay on a short-supply interruption of voltage drop
- □ IEC Rated; not UL Recognized

Power consumption of MX and MN Accessories

Type	Voltage	VA or W
MX (inrush)	415 Vac (IEC)	120
	220–240 Vac	50
	48–130 Vac	200
	110–130 Vdc	10
	48 Vac/Vdc	22
	24 Vac/Vdc	120
MN (holding)	220–240 Vac	4.1
	48 Vac	4.3
	48 Vdc	2.0
MN Ⓢ (holding)	220–240 Vac	4.1

Remote Indication

- ■ OF Auxiliary Switch—Indicates the "open" or "closed" position of the circuit breaker
- ■ SD Alarm Switch—Indicates the "tripped-on-fault" position of the circuit breaker with a red indicator flag on the front panel
- ■ Operation—Test button on the front panel of the OF auxiliary and SD alarm switches allows simulation of the OF and SD functions without operating the circuit breaker

Electrical Ratings

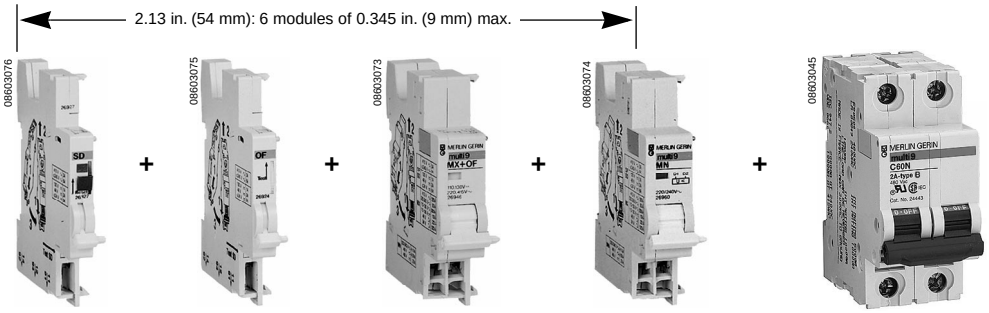
Voltage	Breaking Capacity (A)
277 Vac	3
≤ 240 Vac	6
130 Vdc	1
≤ 48 Vdc	2
≤ 24 Vdc	6

Connection

- ■ Terminal pads for two #16 AWG (1.5 mm^2) cables, or
- ■ Terminal pads for one #14 AWG (2.5 mm^2) cable

Possible Accessory Combinations

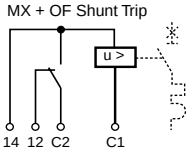
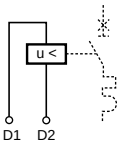
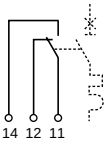
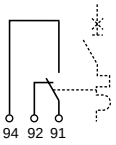
Accessories are mounted to the left of the circuit breaker for a total width of 2.13 in. (54 mm) max.



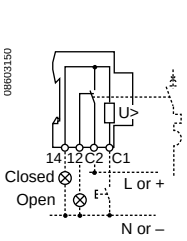
SD Alarm Switch | **OF Auxiliary Switch** | **MX + OF Shunt Trip and Auxiliary Switch** | **MN Undervoltage Release** | **C60 Supplementary Protector**

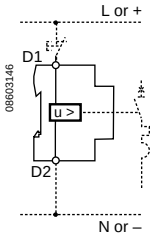
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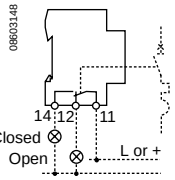
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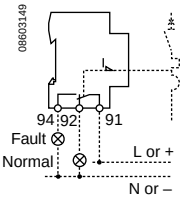
Type		Control Voltage		Width in Modules	Cat. No.	
		Vac	Vdc		UL/IEC	IEC
MX + OF Shunt Trip		24	24	2	MG26974	26948
		48–130	48	2	MG26973	26947
		220–277	110–130	2	MG26972	—
		220–415	110–130	2	—	26946
MN Undervoltage Release	Instantaneous	48	—	2	MG26965	26961
		120	—	2	MG26967	—
		220–240	—	2	MG26964	26960
		—	24	2	MG26968	—
		—	48	2	MG26966	26962
	Time-delayed	220–240	—	4	—	26963
OF Auxiliary Switch				1	MG26925	26924
						
SD Alarm Switch				1	MG26928	26927
						

NOTE: Width of one module = 0.345 in. (9 mm).











MX + OF Shunt Trip and Auxiliary Switch



MN Undervoltage Release



OF Auxiliary Switch



SD Alarm Switch

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Rotary Handle

- Front or lateral operation of C60 2P, 3P and 4P circuit breaker versions
- Degree of protection:
  - IP54 as per IEC 529 (see page 83)
  - NEMA12 and 3R
- IEC Rated; not UL Recognized
- Installation:
  - On door or hinged panel for draw-out rotary handle Cat. No. MG27047
  - On fixed front or side panel with fixed rotary handle Cat. No. MG27048
- A complete rotary handle is made up of a circuit breaker operating subassembly and a handle

Description	Cat. No.
Circuit breaker operating subassembly (fixed to circuit breaker)	MG27046
Draw-out extended handle (mounted on door or hinged panel)	MG27047
Fixed handle front or lateral (mounted on fixed panel)	MG27048

Front Mounting Kit

- UL Recognized
- To be used on 1P, 2P, 3P and 4P devices
- Option: Can be used with Cat. No. MG26981 terminal screw shields for extra clearance on 480 V applications

Front Mounting Kit	Cat. No.
Bracket for 1P	MG26983
Bracket for 2P	MG26984
Bracket for 3P	MG26985
Bracket for 4P	MG26989

Multiple-pole Front Mounting Kit

Consists of a transparent, hinged, weatherproof cover with DIN rail. Allows installation of 20 modules of MULTI 9 circuit breakers.

- Degree of protection as per IEC 529: IP55
- Dimensions:
  - Overall:
    4.96 x 9.25 x 1.30 in. (126 x 235 x 33 mm)
  - Cutout: 3.78 x 7.32 in. (96 x 186 mm)
- IEC Rated; not UL Recognized

Multiple-pole Front Mounting Kit	Cat. No.
Hinged transparent cover (includes a ten module divisible blanking plate and a mounting template).	14210
DIN-rail support	14211

Spacer

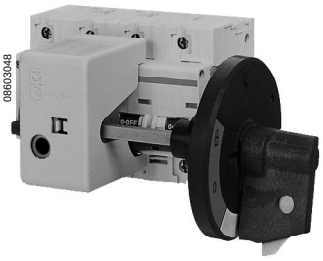
- Clips on DIN rail
- Provides a ventilation gap to prevent overheating
- Provides space for future circuit breakers
- IEC Rated; not UL Recognized

Description	Cat. No.
Width = 0.354 in. (9 mm)	MG27062

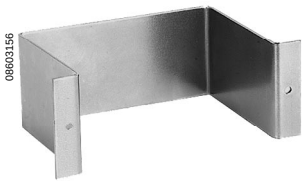
Identification System

- Marking symbols can be used on each of the poles of all C60 supplementary protectors
- The following symbols are available:
  Blank, 0–9, +, – and A–Z
- IEC Rated; not UL Recognized

Identification System	Cat. No.
(Bag of ten)	MG27150



Rotary Handle



Front Mounting Kit



Multi-pole Front Mounting Kit



Spacer



Identification System

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Terminal Cover

- Completely covers terminals
- Enables rear connection
- Includes a sealing device
- IEC Rated; not UL Recognized

Type	Cat. No.
1P	MG26975
2P	MG26976
3P	MG26975 + MG26976
4P	MG26978

Plug-in Base

- For no-load isolation of a circuit protected by a miniature circuit breaker, with locking in “disconnected” position by 0.315 in. (8 mm) diameter padlocks (not supplied)
- IEC Rated; not UL Recognized

Description	Cat. No.
For 1P C60 supplementary protector (minimum center spacing of 7.87 in. [200 mm] between two rows).	MG26996

Screw-type Connection

- Enables front or rear connection with cable lugs
- Screw diameter 0.2 in (5 mm)
- The mounting of interpole barrier (Cat. No. MG27001) is recommended
- Also suitable for use on NC100H supplementary protectors
- IEC Rated; not UL Recognized

Description	Cat. No.
Screw-type connector (eight pieces)	MG27053

Interphase Barriers

- Increases insulation distance between two connectors
- IEC Rated; not UL Recognized

Description	Cat. No.
Interphase barriers (ten pieces)	MG27001

Terminal Screw Shield

- Enables total insulation of the terminal screws on 1P, 2P, 3P and 4P C60 circuit breakers
- IEC Rated; not UL Recognized

Description	Cat. No.
For C60 supplementary protector (bag of two)	MG26981

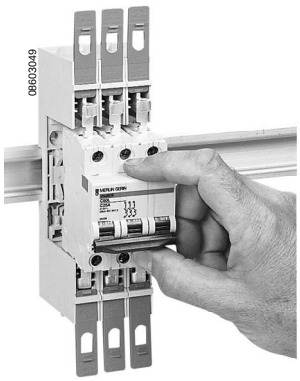
Padlocking Attachment

- This device may be used to lock the circuit breaker in “on” or “off” position by 0.315 in. (8 mm) diameter padlocks (not supplied). The front plate or functional door can be opened with the circuit breaker locked in “off” position.
- Due to the trip-free mechanism, padlocking in the “on” position will not prevent the supplementary protector from tripping under overcurrent or ground-fault conditions.
- IEC Rated; not UL Recognized

Description	Cat. No.
For C60 supplementary protector (bag of two)	MG26970



Terminal Cover



Plug-in Base



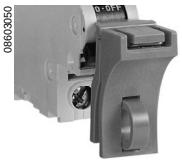
Interphase Barriers



Screw-type Connection



Terminal Screw Shield



Padlock Attachment

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MSC Mounting Base

- IEC Rated; not UL Recognized (see page 33)

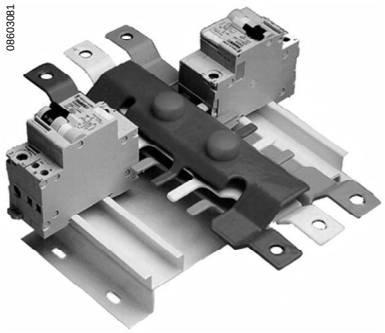
Comb Bus Bars

- Rated insulation voltage: 480 Vac
- Rated current: 200 A
- Available in 1-, 2-, 3- and 4-phase
- Distance between outgoing poles: 0.71 in. (18 mm)

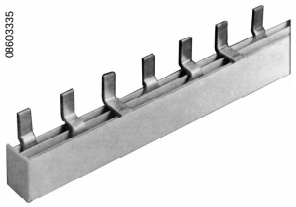
Type		Cat. No.
12 poles	1-phase	MG10285
	2-phase	MG10286
	3-phase	MG10287
	4-phase	MG10288
3.28 ft. (1 meter) (57 poles)	1-phase	MG10289
	2-phase	MG10290
	3-phase	MG10291
	4-phase	MG10292

Connector and Caps

Type	Cat. No.
Connector #2 AWG (35 mm^2)	MG10307
Extra end caps (40 pieces)	MG10305
Tooth caps (40 pieces)	MG10306



MSC Mounting Base



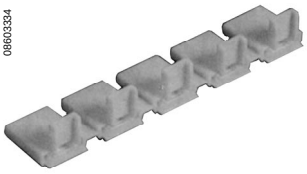
Comb Bus Bar



Connector



End Cap



Tooth Cap

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Standard Features

- Fast closing: Allows increased withstand to the high inrush currents of some loads
- Trip-free mechanism: Contacts cannot be held in the on position when the supplementary protector is tripped automatically
- Isolation with positive break indication—Green strip on the circuit breaker's operation handle indicates that all poles are open
- Number of operating cycles (O–C): 20,000
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C)
- Degree of protection (see page 83):
  - Case: IP40 as per IEC 529
  - Terminals: IP20
- Temperature:
  - Operation: 23 to 140°F (–5 to 60°C)
  - Storage: –40 to 212°F (–40 to 100°C)

Interrupting Ratings

Rating (A) 77°F/25°C	Number of Poles	Voltage	Interrupting Rating (A)	
			UL 1077	IEC 947-2
10–40	1P	240 Vac	20,000	10,000
	2P/3P/4P	240 Vac	20,000	20,000
	1P	277 Vac	10,000	—
	2P/3P/4P	415 Vac	—	10,000
		480Y/277 Vac	10,000	—
	1P	125 Vdc	10,000	10,000
	2P	250 Vdc	10,000	10,000
50–80	1P	240 Vac	5,000	10,000
	2P/3P/4P	240 Vac	5,000	20,000
		415 Vac	—	10,000
		440 Vac	—	6,000
	1P	65 Vdc	10,000	10,000
	2P	125 Vdc	10,000	10,000

Compliance with Standards

- UL 1077 Supplementary Protectors File #E90509
- CSA C22.2 No. 235-M89 Supplementary Protectors File #LR80849
- IEC 947-2, VDE 0660
- CE Marked

Time-Current Curves

B Curve—Overcurrent protection for sensitive equipment (computers, electronic devices etc.):
- Ratings: 80 A set at 77°F (25°C)
- Tripping curve: The magnetic operates between 3.2 and 4.8 times ampere rating

C Curve—Overcurrent protection for all application types:
- Ratings: 10–80 A set at 77°F (25°C)
- Tripping curve: The magnetic operates between 7 and 10 times ampere rating

D Curve—Overcurrent protection for loads with high inrush currents. (motors, transformers etc.):
- Ratings: 10–40 A set at 77°F (25°C)
- Tripping curve: The magnetic operates between 10 and 14 times ampere rating

Weight (oz./g)

Type	1P	2P	3P	4P
NC100H	6.35/180	12.70/360	19.05/540	25.40/720

Connection

- 10–40 A: #18–#2 AWG (1–35 mm^2) cables
- 50–80 A: #8–#1 AWG (10–50 mm^2) cables

Ground-fault Protection

IEC Rated; not UL Recognized (see page 38)

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B Curve—NC100H Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
80	MG27164	MG27175	MG27186	MG27197

C Curve—NC100H Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	MG27154	MG27166	MG27177	MG27188
15	MG18256	MG18271	MG18286	—
16	MG27155	MG27167	MG27178	MG27189
20	MG27156	MG27168	MG27179	MG27190
25	MG27157	MG27169	MG27180	MG27191
30	MG18257	MG27170	MG18287	—
32	MG27158	MG27170	MG27181	MG27192

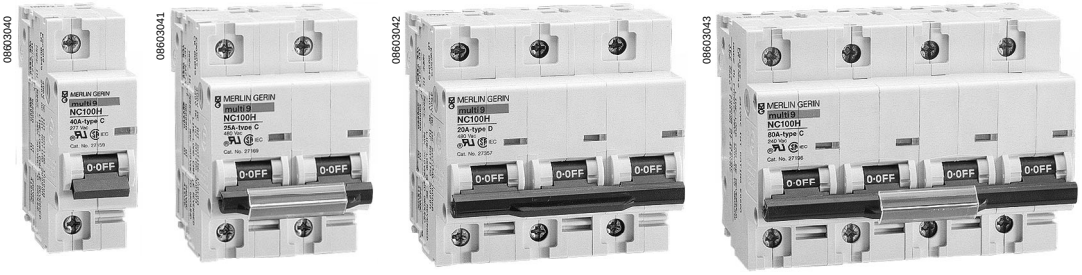
Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
35	MG18258	MG18273	MG18288	—
40	MG27159	MG27171	MG27182	MG27193
50	MG27160	MG27172	MG27183	MG27194
60	MG18259	MG18274	MG18289	—
63	MG27162	MG27173	MG27184	MG27195
80	MG27163	MG27174	MG27185	MG27196

D Curve—NC100H Supplementary Protectors

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	MG27333	MG27344	MG27355	MG27366
15	MG18261	MG18276	MG18291	—
16	MG27334	MG27345	MG27356	MG27367
20	MG27335	MG27346	MG27357	MG27368
25	MG27336	MG27347	MG27358	MG27369

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
30	MG18262	MG18277	MG18292	—
32	MG27337	MG27348	MG27359	MG27370
35	MG18263	MG18278	MG18293	—
40	MG27338	MG27349	MG27360	MG27371

NOTE: Width of one module = 0.354 in. (9 mm).



1P 2P 3P 4P

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Remote Tripping

Remote tripping is possible by means of an MX shunt trip or MN undervoltage release. A tripped supplementary protector is indicated by a red indicator flag on the front panel.

- ■ MX + OF shunt trip—When energized, trips the associated supplementary protector
  - □ Is equipped with a cut-off switch
  - □ Is equipped with an O + F switch that indicates the “open” or “closed” position of the supplementary protector
- ■ MN undervoltage release—When voltage drops to 70–35% of supply voltage, the associated supplementary protector trips and is prevented from reclosing until supply voltage is restored
  - □ Complies with UL, CSA and IEC Standards
  - □ Uses emergency stop via push button
  - □ Uses safety feature on circuit supplying several machines preventing uncontrolled restarting of the motors
- ■ MN Ⓢ time-delayed undervoltage release
  - □ Is equipped with undervoltage release which controls the opening of the associated supplementary protector
  - □ Allows a 0.5 second time delay on a short supply interruption of voltage drop
  - □ IEC Rated; not UL Recognized

Power Consumption of MX and MN Accessories

Type	Voltage	VA or W
MX (inrush)	220–240 Vac	50
	48–130 Vac	200
	110–130 Vdc	10
	48 Vac/Vdc	22
	24 Vac/Vdc	120
MN (holding)	220–240 Vac	2.3
	48/130 Vac	2.2
	110/130 Vac	2.0
	48 Vac/Vdc	2.0
	24 Vac/Vdc	2.3
MN Ⓢ (holding)	220–240	4.1

Remote Indication

- ■ OF auxiliary switch—Indicates the “open” or “closed” position of the circuit breaker
- ■ SD alarm switch—Indicates the “tripped-on-fault” position of the circuit breaker with a red indicator flag on the front panel
- ■ Operation—Test button allows simulation of the OF and SD functions without operating the circuit breaker

Electrical Ratings

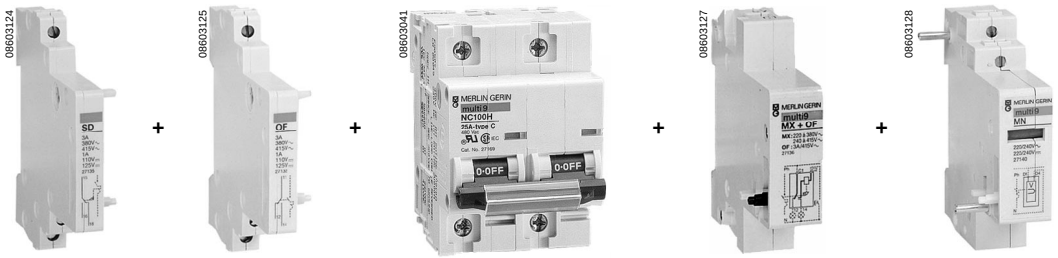
Voltage	Breaking Capacity (A)
277 Vac	3
≤ 240 Vac	6
130 Vdc	1
≤ 48 Vdc	2
≤ 24 Vdc	6

Connection

Terminal screws for:

- ■ Two #16 AWG (1.5 mm^2) cables, or
- ■ One #14 AWG (2.5 mm^2) cable

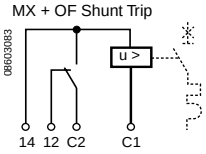
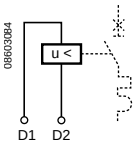
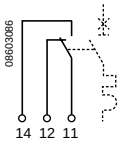
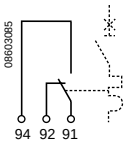
Possible Accessory Combinations



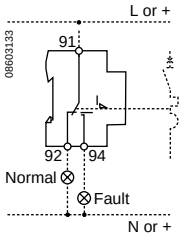
SD Alarm Switch + **OF Auxiliary Switch** + **NC100H Supplementary Protector** + **MX + OF Shunt Trip** + **MN Undervoltage Release**

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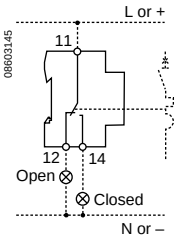
Type		Control Voltage		Width in Modules	Cat. No.	
		Vac	Vdc		UL/IEC	IEC
MX + OF Shunt Trip		24–48	24–48	2	MG27130	27138
		110–220	110–130	2	MG27129	27137
		220–277	—	2	MG27128	—
		220–415	—	2	—	27136
MN Undervoltage Release	Instantaneous	110–130	—	2	MG27126	—
		220–240	—	2	MG27125	27140
		220–240	220–240	2	—	27140
	Time-delayed	220–240	220–240	2	—	27143
OF Auxiliary Switch				1	MG27121	27132
						
SD Alarm Switch				1	MG27122	27135
						

NOTE: Width of one module = 0.345 in. (9 mm).



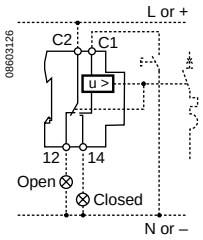


SD Alarm Switch



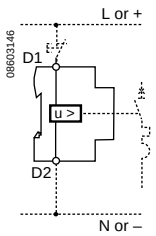


OF Auxiliary Switch





MX + OF Shunt Trip and Auxiliary Switch





MN Undervoltage Release

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Rotary Handle

- Front or lateral operation of NC100 2P, 3P and 4P circuit breaker versions
- Degree of protection:
  - IP54 as per IEC 529 (see page 83)
  - NEMA12 and 3R
- IEC Rated; not UL Recognized
- Installation:
  - On door or hinged panel for draw-out handle Cat. No. MG27047
  - On fixed front or side panel with fixed handle Cat. No. MG27048
- A complete rotary handle is made up of a circuit breaker operating subassembly and a handle

Description	Cat. No.
Circuit Breaker operating subassembly (fixed to circuit breaker)	MG27046
Draw-out extended handle (mounted on door or hinged panel)	MG27047
Fixed handle front or lateral (mounted on fixed panel)	MG27048

Front Mounting Kit

- UL Recognized
- To be used on 1P, 2P, 3P, and 4P devices
- Option: Can be used with Cat. No. MG27152 sealable screw shields for extra clearance on 480 V applications

Front Mounting Kit	Cat. No.
Bracket for 1P	MG26986
Bracket for 2P	MG26987
Bracket for 3P	MG26988
Bracket for 4P	MG26990

Multi-pole Front Mounting Kit

Consists of a transparent, hinged, weatherproof cover with DIN rail. Allows installation of 20 modules of MULTI 9 circuit breakers.

- Degree of protection as per IEC 529: IP55
- Dimensions:
  - Overall: 4.96 x 9.25 x 1.30 in. (126 x 235 x 33 mm)
  - Cutout: 3.78 x 7.32 in. (96 x 186 mm)
- IEC Rated; not UL Recognized

Multiple-pole Front Mounting Kit	Cat. No.
Hinged transparent cover (includes a 10 module divisible blanking plate and a mounting template).	14210
DIN-rail support	14211

Spacer

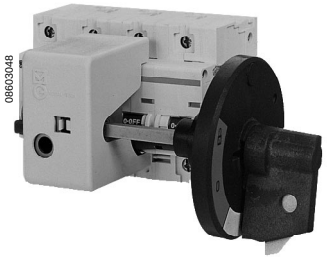
- Clips on DIN rail
- Provides a ventilation gap to prevent overheating
- Provides space for future circuit breakers
- IEC Rated; not UL Recognized

Description	Cat. No.
Width = 0.354 in. (9 mm)	MG27062

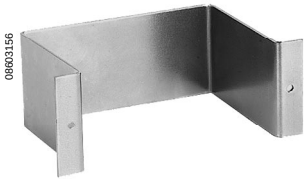
Identification System

- Marking symbols may be used on each of the poles of all NC100H supplementary protectors
- The following symbols are available: Blank, 0–9, +, – and A–Z
- IEC Rated; not UL Recognized

Identification System	Cat. No.
(Bag of ten)	MG27150



Rotary Handle



Front Mounting Kit



Multi-pole Front Mounting Kit



Spacer



Identification System

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Terminal Cover

- Completely covers terminals
- Enables rear connection

IEC Rated; not UL Recognized

Description	Cat. No.
1P (set of two)	MG27151

Terminal Screw Shield

- Enables total isolation of the device terminal screws
- IEC Rated; not UL Recognized

Description	Cat. No.
For NC100H supplementary protector (bag of two)	MG27152

Label Holder

- Used to identify the 2P, 3P or 4P devices on the handle
- IEC Rated; not UL Recognized

Label Holder	Cat. No.
(Bag of ten)	MG27150

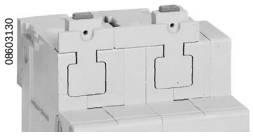
Padlock Attachment

- May be used to lock the circuit breaker in “on” or “off” position using 0.315 in. (8 mm) diameter padlocks (not supplied)
- Front plate or functional door can be opened with the circuit breaker locked in “off” position
- Due to the trip-free mechanism, padlocking in the “on” position will not prevent the supplementary protector from tripping under overcurrent or ground-fault conditions
- IEC Rated; not UL Recognized

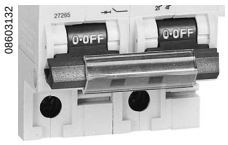
Padlock Attachment	Cat. No.
For NC100 supplementary protector (bag of two)	MG27145



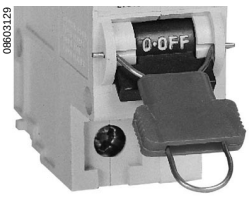
Terminal Cover



Terminal Screw Shield



Label Holder



Padlock Attachment

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MSC Mounting Base

IEC Rated; not UL Recognized (see page 44)

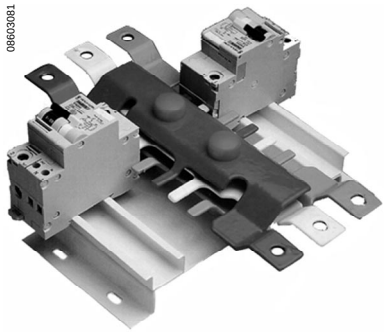
Comb Bus Bars

- Voltage: 480 Vac
- Rated current: 200 A
- Available in 1-, 2-, 3- and 4-phase
- Distance between outgoing poles: 0.71 in. (18 mm)

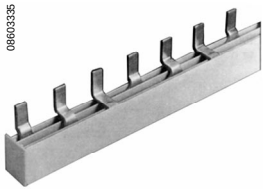
Type		Cat. No.
9P	1-phase	MG10293
	2-phase	MG10294
	3-phase	MG10295
	4-phase	MG10296
3.28 ft. (1 m) (36 poles)	1-phase	MG10297
	2-phase	MG10298
	3-phase	MG10299
	4-phase	MG10300

Connector and Caps

Type	Cat. No.
Connector #2 AWG (35 mm^2)	MG10307
Extra end caps (40 pieces)	MG10305
Tooth caps (40 pieces)	MG10306



Multi 9 Mounting Base



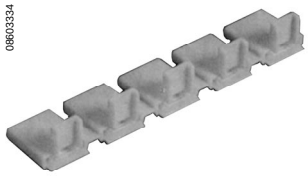
Comb Bus Bar



Connector



End Cap



Tooth Cap

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Standard Features

- Combines overcurrent and ground-fault protection
- Voltage: 230 Vac
- Ratings at 86°F/30°C:
  - DPN-N: 1–40 A
  - DPN-N Vigi: 4–40 A
- Positive contact indication
- DPN-N Vigi: For ground-fault protection
  - With ground-fault indicator
  - AC class
- Number of operating cycles (O–C):
  - Mechanical: 20,000
  - Electrical:
    - 1–20 A: 20,000
    - 25 A: 15,000
    - 32 A: 10,000
    - 40 A: 6,000
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C).
- Weight:
  - DPN-N: 4.23 oz. (120 g)
  - DPN-N Vigi: 6.70 oz. (190 g)

Compliance with Standards

- IEC 947-2 and IEC 898
- IEC 1009
- CE Marked

Time-Current Curves

B Curve—Provides control and protection against overcurrents for very long cables. Magnetic trip units operate between 3 and 5 I_n.

C Curve—Provides control and protection against circuit overcurrents in tertiary and industrial final distribution with TT or TNS grounding systems. Magnetic trip units operate between 5 and 10 I_n.

Accessories

The same electrical accessories as the C60 circuit breaker can be added to the DPN-N circuit breakers (see page 7).

Connection

- #8 AWG (10 mm^2) flexible cable
- #6 AWG (16 mm^2) rigid cable

Interrupting Ratings

Standard	Voltage	Interrupting Rating I_{cn} (A)
IEC 947-2	230 Vac	7,500
	400 Vac	3,000 (1)
IEC 898	230 Vac	6,000

(1) Single pole interrupting rating for IT type European grounding systems (insulated neutral—double fault).

Circuit Breakers

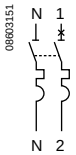
Rating (A)	1P+N—B Curve 2 Modules	1P+N—C Curve 2 Modules
1	—	19260
2	—	19261
4	19249	19263
6	19250	19264
10	19252	19266
16	19254	19268
20	19255	19269
25	19256	19270
32	19257	19271
40	19258	19272

Circuit Breakers with Ground-fault Protection

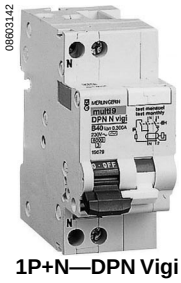
Rating (A)	1P+N—B Curve 4 Modules		1P+N—C Curve 4 Modules	
	30 mA	300 mA	30 mA	300 mA
1	—	—	—	—
2	—	—	—	—
4	19650	19670	—	—
6	19651	19671	19661	19681
10	19653	19673	19663	19683
16	19655	19675	19665	19685
20	19656	19676	19666	19686
25	19657	19677	19667	19687
32	19658	19678	19668	19688
40	19659	19679	19669	19689

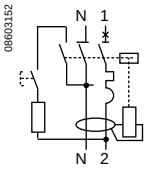
NOTE: Width of one module = 0.345 in. (9 mm).





1P+N—DPN-N





1P+N—DPN Vigi

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Standard Features

- Fast Closing—Allows increased withstand to the high inrush currents of some loads
- Trip-free mechanism: Contacts cannot be held in the on position when the circuit breaker is tripped automatically
- Isolation with positive break indication—Green strip on the circuit breaker operating handle indicates that all poles are open
- Number of operating cycles (O–C): 20,000
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C)
- Degree of Protection as per IEC 529
  - Case: IP40 (see page 83)
  - Terminals: IP20
- Temperature:
  - Operation: 23 to 140°F (–5 to 60°C)
  - Storage: –40 to 212°F (–40 to 100°C)

Compliance with Standards

- IEC 898 and IEC 947-2
- CE Marked

Interrupting Ratings

Type	Standard	Rating at 86°F/30°C (1) (A)	Number of Poles	Voltage (Vac)	Interrupting Rating I_{cn} (A)
C60N	IEC 898	0.5–63	1P	220–240	6,000
			2P/3P/4P	400–415	6,000
	IEC 947-2	0.5–63	1P	230–240	10,000
				400–415	3,000 (2)
			2P/3P/4P	230–240	20,000
			2P/3P/4P	400–415	10,000
C60H	IEC 898	0.5–63	1P	230–400	10,000
			2P/3P/4P	400–415	10,000
	IEC 947-2	0.5–63	1P	130	30,000
				240	15,000
				415	4,000 (2)
			2P/3P/4P	240	30,000
				415	15,000
				440	10,000
C60L (1)	IEC 947-2	0.5–25	2P/3P/4P	230–240	50,000
				400–415	25,000
				440	20,000
		32–40	2P/3P/4P	230–240	40,000
				400–415	20,000
				440	15,000
		50–63	2P/3P/4P	230–240	30,000
				400–415	15,000
				440	10,000

(1) C60L rated at 104°F/40°C.
(2) Single-pole interrupting rating for IT type European grounding system (insulated neutral—double fault).

Weight (oz./g)

Type	1P	2P	3P	4P
C60N	3.88/110	7.75/220	11.64/330	15.52/440
C60H	4.23/120	8.47/240	12.70/360	16.93/480
C60L	4.23/120	8.47/240	12.70/360	16.93/480
C60L-MA	—	8.47/240	12.70/360	—

Connection

Type	Rating (A)	Cable	Cable Size
C60N C60H C60L	0.5–25	Flexible	#6 AWG (16 mm^2)
		Rigid	#4 AWG (25 mm^2)
	32–63	Flexible	#4 AWG (25 mm^2)
		Rigid	#2 AWG (35 mm^2)
C60L-MA	1.6–10	Flexible	#6 AWG (16 mm^2)
		Rigid	#4 AWG (25 mm^2)
	12.5–40	Flexible	#4 AWG (25 mm^2)
		Rigid	#2 AWG (35 mm^2)

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Time-Current Curves

Z Curve—Overcurrent protection for electronic circuits:
- C60L: The magnetic operates between 2.4 and 3.6 I_n

B Curve—Overcurrent protection for sensitive equipment (computers, electronic devices etc.):
- C60N/H: The magnetic operates between 3 and 5 I_n

C Curve—Overcurrent protection for all application types:
- C60N/H: The magnetic operates between 5 and 10 I_n
- C60L: The magnetic operates between 7 and 10 I_n

D and K Curves—Overcurrent protection for loads with high inrush currents (motors, transformers, etc.)
- C60N/H/L: The magnetic operates between 10 and 14 I_n

MA Curve—C60L-MA circuit breakers are designed for motor circuit protection against short circuits. These circuit breakers are equipped only with magnetic trip units, therefore they must be combined with a suitable protection device.

- The magnetic releases at 12 I_n

C32H-DC for DC Protection

See page 34.

C60L-MA Circuit Breaker and Contactor Coordination

Standard IEC 947-4 defines tests at various current levels with the aim of placing the switchgear in extreme conditions. According to the status of components after testing, the standard defines two types of coordination.

Type 1

Deterioration of the contactor and relay is accepted under two conditions:
- There is no risk for the operator
- Parts other than the contactor and relay must not be damaged

Type 2
- Welding of the contactor or starter contacts is accepted only if they can easily be separated
- After Type 2 coordination tests, the functions of protection and operation can be achieved

The choice of coordination type depends on the operating parameters. It must be suitable for the user's needs and ensure optimized cost of the installation.

Type1
- Qualified maintenance service
- Reduced volume and cost of equipment
- Continuity of service not required or ensured by replacing the faulty motor bucket

Type 2
- Continuity of service is vital
- Reduced maintenance service
- Specification calling for Type 2 coordination
- Various thermal relay classes: The thermal relay class must be appropriate for the motor starting time

Classes	Tripping Time at 7.2 I_r (s)
10/10 A	2–10
20 A	6–20

Coordination Table—Type 1

Motors								Circuit Breaker			Contactor	Thermal Relay	
P (kW) 220/230 V	I (A)	P (kW) 380/400 V	I (A)	P (kW) 415 V	I (A)	P (kW) 440 V	I (A)	Type	Rating (A)	I_{rm} (A)	Type	Type	I_{rth} (A)
—	—	0.37	1.2	0.37	1.1	0.37		C60L-MA	1.6	20	LC1-D09	LR2 D1306	1/1.6
—	—	0.55	1.5	0.55	1.5	0.55		C60L-MA	1.6	20	LC1-D09	LR2 D1306	1.25/2
0.37	2	0.75	2	0.75	1.8	0.75		C60L-MA	2.5	30	LC1-D09	LR2 D1307	1.6/2.5
—	—	—	—	1.1	2.6	—	—	C60L-MA	4	50	LC1-D09	LR2 D1308	2.5/4
0.55	2.8	11	2.8	1.5	3.4	1.5	3.1	C60L-MA	4	50	LC1-D09	LR2 D1308	2.5/4
11	5	2.2	5.3	2.2	4.8	2.2	4.5	C60L-MA	6.3	75	LC1-D09	LR2 D1310	4/6
1.5	6.5	3	7	3	6.5	3	5.8	C60L-MA	10	120	LC1-D09	LR2 D1312	5.5/8
2.2	9	4	9	4	8.2	4	7.9	C60L-MA	10	120	LC1-D09	LR2 D1314	7/10
—	—	5.5	12	5.5	11	—	—	C60L-MA	12.5	150	LC1-D12	LR2 D1316	9/13
4	15	7.5	16	7.5	14	7.5	13.7	C60L-MA	16	190	LC1-D18	LR2 D1321	12/18
—	—	—	—	9	17	9	13.7	C60L-MA	25	300	LC1-D18	LR2 D1321	12/18
5.5	20	11	23	11	21	11	16.9	C60L-MA	25	300	LC1-D25	LR2 D1322	17/25
7.5	28	15	30	15	28	15	20.1	C60L-MA	40	480	LC1-D32	LR2 D3353	23/32
—	—	18.5	37	—	—	—	—	C60L-MA	40	480	LC1-D40	LR2 D3355	30/40
11	39	—	—	22	40	22	39	C60L-MA	40	480	LC1-D50	LR2 D3357	37/50

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B Curve—C60N Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1	24045	24071	24084	24097
2	24046	24072	24085	24098
3	24047	24073	24086	24099
4	24048	24074	24087	24100
6	24049	24075	24088	24101
10	24050	24076	24089	24102
16	24051	24077	24090	24103

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
20	24052	24078	24091	24104
25	24053	24079	24092	24105
32	24054	24080	24093	24106
40	24055	24081	24094	24107
50	24056	24082	24095	24108
63	24057	24083	24096	24109

C Curve—C60N Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	24067	24068	24069	24070
1	24395	24331	24344	24357
2	24396	24332	24345	24358
3	24397	24333	24346	24359
4	24398	24334	24348	24360
6	24399	24335	24348	24361
10	24401	24336	24349	24362

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
16	24403	24337	24350	24363
20	24404	24338	24351	24364
25	24405	24339	24352	24365
32	24406	24340	24353	24366
40	24407	24341	24354	24367
50	24408	24342	24355	24368
63	24409	24343	24356	24369

D Curve—C60N Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1	24625	24653	24667	24681
2	24626	24654	24668	24682
3	24627	24655	24669	24683
4	24628	24656	24670	24684
6	24629	24657	24671	24685
10	24630	24658	24672	24686
16	24632	24660	24674	24688

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
20	24633	24661	24675	24689
25	24634	24662	24676	24690
32	24635	24663	24677	24691
40	24636	24664	24678	24692
50	24637	24665	24679	24693
63	24638	24666	24680	24694

MA Curve—C60N Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1.6	—	26345	26357	—
2.5	—	26346	26358	—
4	—	26347	26359	—
6.3	—	26348	26360	—
10	—	26349	26361	—

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
12.5	—	26350	26362	—
16	—	26352	26368	—
25	—	26353	26369	—
40	—	26355	26370	—

NOTE: Width of one module = 0.354 in. (9 mm).



1P



2P



3P



4P

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B Curve—C60H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
6	24643	24725	24738	24751
10	24644	24726	24739	24752
13	24645	—	—	—
16	24646	24727	24740	24753
20	24647	24728	24741	24754

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
25	24648	24729	24742	24755
32	24649	24730	24743	24756
40	24650	24731	24744	24757
50	24651	24732	24745	24758
63	24652	24733	24746	24759

C Curve—C60H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	24900	24902	24906	24908
0.75	24901	24903	24907	24909
1	24968	24981	24994	25007
2	24969	24982	24995	25008
3	24970	24983	24996	25009
4	24971	24984	24997	25010
6	24972	24985	24998	25011
10	24973	24986	24999	25012

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
16	24974	24987	25000	25013
20	24975	24988	25001	25014
25	24976	24989	25002	25015
32	24977	24990	25003	25016
40	24978	24991	25004	25017
50	24979	24992	25005	25018
63	24980	24993	25006	25019

D Curve—C60H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	25171	25172	25173	25174
1	25152	25183	25196	25211
2	25155	25184	25197	25212
3	25157	25185	25198	25213
4	25158	25186	25199	25214
6	25159	25187	25200	25215
10	25160	25188	25201	25216

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
16	25161	25189	25202	25217
20	25164	25190	25203	25218
25	25165	25191	25205	25219
32	25166	25192	25207	25220
40	25167	25193	25208	25221
50	25168	25194	25209	25222
63	25169	25195	25210	25223

NOTE: Width of one module = 0.354 in. (9 mm).



1P



2P



3P



4P

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Z Curve—C60L Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1	26133	—	—	—
1.6	26134	26154	26174	26232
2	26135	26155	26176	26234
3	26136	26157	26177	26236
4	26137	26158	26178	26237
6	26139	26159	26180	26239

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
10	26141	26161	26182	26241
16	26142	26163	26184	26242
20	26143	26164	26185	26243
25	26145	26165	26224	26244
32	26146	26166	26225	26245
40	26147	26167	26226	26246

B Curve—C60L Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
6	25331	25357	25370	25383
10	25332	25358	25371	25384
16	25333	25359	25372	25385
20	25334	25360	25373	25386
25	25335	25361	25374	25387

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
32	25336	25362	25375	25388
40	25337	25363	25376	25389
50	25338	25364	25377	25390
63	25339	25365	25378	25391

C Curve—C60L Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
0.5	25406	25407	25408	25409
1	25392	25418	25431	25444
2	25393	25419	25432	25445
3	25394	25420	25433	25446
4	25395	25421	25434	25447
6	25396	25422	25435	25448
10	25397	25423	25436	25449

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
16	25398	25424	25437	25450
20	25399	25425	25438	25451
25	25400	25426	25439	25452
32	25401	25427	25440	25453
40	25402	25428	25441	25454
50	25403	25429	25442	25455
63	25404	25430	25443	25456

K Curve—C60L Circuit Breakers

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
1	25460	25478	25496	25514
1.6	25461	25479	25497	25515
2	25462	25480	25498	25516
3	25463	25481	25499	25517
4	25464	25482	25500	25518
6	25465	25483	25501	25519

Rating (A)	1P	2P	3P	4P
	2 Modules	4 Modules	6 Modules	8 Modules
10	25467	25485	25503	25521
16	25468	25486	25504	25522
20	25469	25487	25505	25523
25	25470	25488	25506	25524
32	25471	25489	25507	25525
40	25472	25490	25508	25526

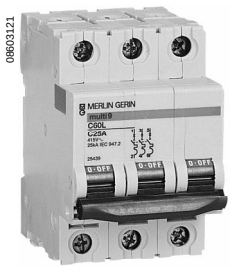
NOTE: Width of one module = 0.354 in. (9 mm).



1P



2P



3P



4P

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Description

The MULTI 9 Vigi module is an electromechanical device which operates without an auxiliary supply source. The C60 Vigi module incorporates the residual current relay and the toroid in the same case.

Function

Vigi modules combine with the 2P, 3P and 4P MULTI 9 C60 circuit breakers to provide:

- Protection of people against indirect contact
- Additional protection of people against direct contact (10 and 30 mA)
- Protection of electrical installations against insulation faults

Standard Features

- The combination of the C60 circuit breaker and the Vigi module forms a residual current device which conforms to IEC 1009 and EN 61 009 standards
- The C60 circuit breaker and Vigi module combination is protected against nuisance tripping due to transient overvoltages such as lightning, switching on the network, etc.
- The AC class Vigi module guarantees tripping for sinusoidal ac residual currents, either suddenly applied or slowly increasing
- Total vertical discrimination with the $I_{\Delta n}$ = 300 mA “selective” or $I_{\Delta n}$ = 1 A “selective” sensitivities if it is installed:
  - Upstream from the instantaneous residual current device
  - Downstream from an index II, time-delayed residual current device where in both cases the $I_{\Delta n}$ of the downstream device ≤ $I_{\Delta n/2}$ of the upstream device
- Two-pole Vigi modules rated ≤ 25 A are equipped with a polarizing slot to avoid installation on circuit breakers with ratings less than 25 A
- Voltage:
  - 220–415 Vac, +10% –20%, 50/60 Hz
  - 130–240 Vac, +10% –20%, 50/60 Hz
- Current rating: Two ranges $I_n \leq 25$ A and $I_n \leq 63$ A
- Time/current curve:
  - Instantaneous or selective release Ⓢ
- Fixed sensitivities for all ratings
- Handle allows two reset modes:
  - Resetting of the C60 circuit breaker + Vigi module assembly in a single operation
  - Separate resetting of the C60 circuit breaker + Vigi module. The Vigi module is reset before the circuit breaker
- Mechanical indication: Visual indicator of the ground fault on the front panel by a red mechanical indicator on the Vigi module operating handle

Weight (oz./g)

Type	2P	3P	4P
Vigi 0.5–25 A	4.23/120	6.35/180	6.35/180
Vigi 30–63 A	5.29/150	7.41/210	7.41/210

Accessories

- Terminal screw shields prevent contact with the Vigi module terminal screws
- Bag includes 20 pieces of single-pole shields (Cat. No. 26982).

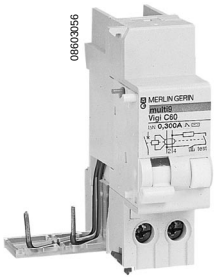
Connection

Rating	Type	Wire Size	
≤25 A	Flexible	#6 AWG	16 mm²
	Rigid	#4 AWG	25 mm²
≤63 A	Flexible	#4 AWG	25 mm²
	Rigid	#2 AWG	35 mm²



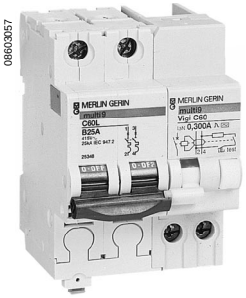
C60 Circuit Breaker

+



Vigi Module

=



Residual Current Circuit Breaker

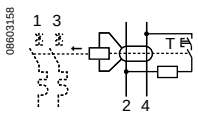
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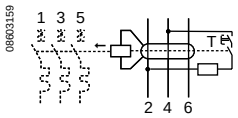
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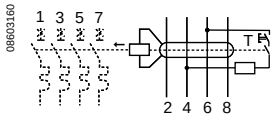
Vigi C60 Module—AC Class

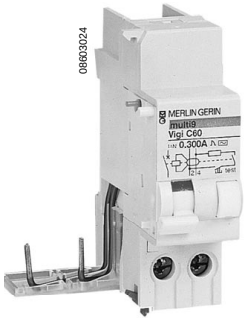
Rating (A)	Voltage (Vac)	Sensitivity (mA)	2P 3 Modules	2P 4 Modules	3P 7 Modules	4P 7 Modules
≤ 25	220–415	10	26580	—	—	—
		30	26581	—	—	—
≤ 63	220–415	30	—	26611	26620	26643
		300 S	—	26616	26631	26648
		1000 S	—	26618	26636	26650

NOTE: Width of one module = 0.354 in. (9 mm).

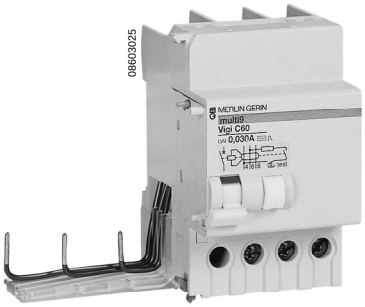




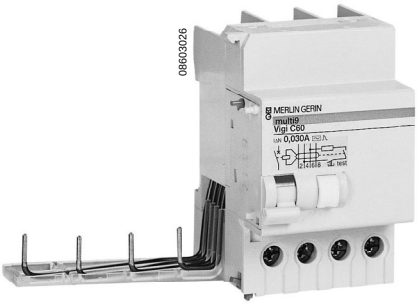




2P Vigi C60 Module



3P Vigi C60 Module



4P Vigi C60 Module

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Remote Tripping

Remote tripping is possible by means of an MX shunt trip or MN undervoltage release. A tripped circuit breaker is indicated by a red indicator flag on the front panel.

- ■ MX + OF shunt trip—When energized, trips the associated circuit breaker
- □ Equipped with a cut-off switch
- □ Equipped with an O + F switch that indicates the "open" or "closed" position of the circuit breaker
- ■ MN undervoltage release—When the voltage to the MN Undervoltage Release drops to 70–35% of the supply voltage, the associated circuit breaker trips and is prevented from reclosing until the supply voltage is restored
- □ Complies with NF and IEC Standards
- □ Uses emergency stop via push button
- ■ Uses safety feature on circuit supplying several machines preventing uncontrolled restarting of the motors
- ■ MN Ⓢ time-delayed undervoltage release
- □ Undervoltage release controls the opening of the associated circuit breaker
- □ Allows a 0.5 second time delay on a short-supply interruption of voltage drop
- □ IEC Rated; not UL Recognized

Power consumption of MX and MN Accessories

Type	Voltage	VA or W
MX (inrush)	415 Vac	120
	220–240 Vac	50
	48–130 Vac	200
	110–130 Vdc	10
	48 Vac/Vdc	22
	24 Vac/Vdc	120
MN (holding)	220–240 Vac	4.1
	48 Vac	4.3
	48 Vdc	2.0
MN Ⓢ (holding)	220–240 Vac	4.1

Remote Indication

- ■ OF auxiliary switch—Indicates the "open" or "closed" position of the circuit breaker
- ■ SD alarm switch—Indicates the "tripped-on-fault" position of the circuit breaker with a red indicator flag on the front panel
- ■ Operation—A test button allows simulation of the OF and SD functions without operating the circuit breaker

Electrical Ratings

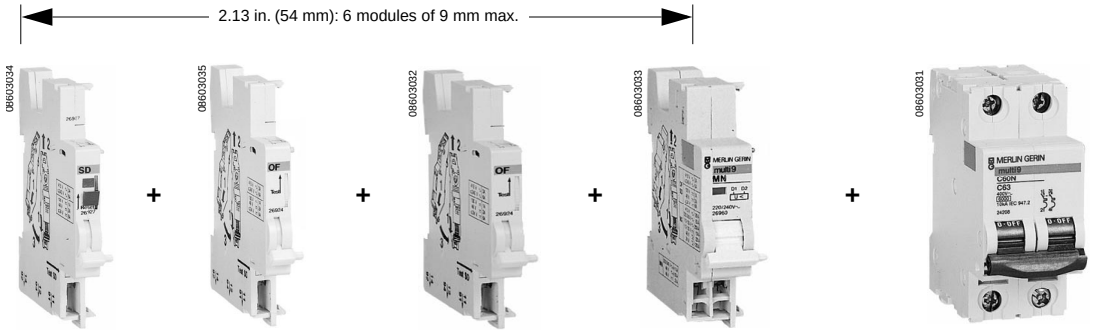
Voltage	Vac/Vdc	Breaking Capacity (A)
415	Vac	3
≤ 240	Vac	6
130	Vdc	1
≤ 48	Vdc	2
≤ 24	Vdc	6

Connection

- ■ Terminal pads for two #16 AWG (1.5 mm^2) cables
- ■ Terminal pads for one #14 AWG (2.5 mm^2) cable

Possible Accessory Combinations

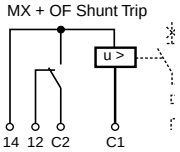
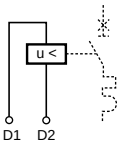
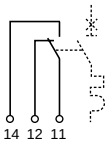
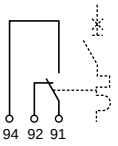
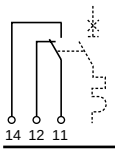
Accessories are mounted to the left of the circuit breaker for a total width of 2.13 in. (54 mm) max.



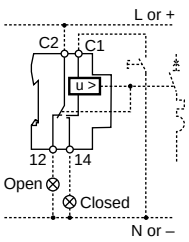
SD Alarm Switch | **OF Auxiliary Switch** | **MX + OF Shunt Trip and Auxiliary Switch** | **MN Undervoltage Release** | **C60 Circuit Breaker**

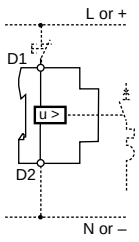
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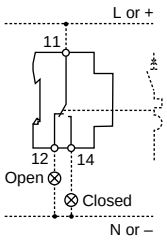
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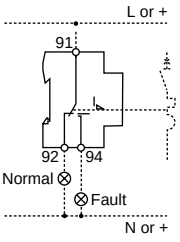
Type		Control Voltage		Width in Modules	Cat. No.	
		Vac	Vdc		UL/IEC	IEC
MX + OF Shunt Trip		24	24	2	MG26974	26948
		48–130	48	2	MG26973	26947
		220–277	110–130	2	MG26972	—
		220–415	110–130	2	—	26946
MN Undervoltage Release	Instantaneous	48	—	2	MG26965	26961
		120	—	2	MG26967	—
		220–240	—	2	MG26964	26960
		—	24	2	MG26968	—
		—	48	2	MG26966	26962
	Time-delayed	220–240	—	4	—	26963
OF Auxiliary Switch				1	MG26925	26924
						
SD Alarm Switch				1	MG26928	26927
						
OFS Auxiliary Switch—Required only on ID residual current switch				1	—	26923
						

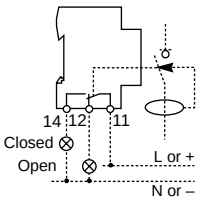
NOTE: Width of one module = 0.345 in. (9 mm).













MX + OF Shunt Trip



MN Undervoltage Release



OF Auxiliary Switch



SD Alarm Switch



OFS Auxiliary Switch

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Tm Motor Operator

The Tm modules allow remote operation of the C60 and C60 Vigi circuit breakers via the handle. Remote reclosing can be disabled by the use of an SD alarm switch (Cat. No. 26927) wired in series with the Tm motor operator.

Standard Features

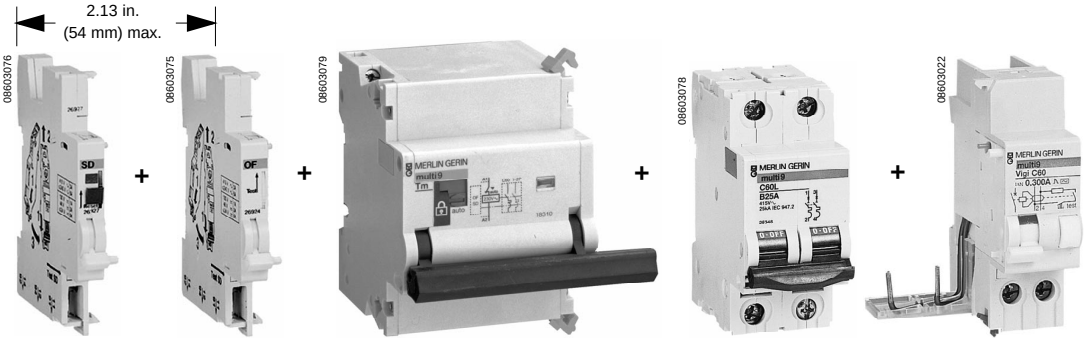
- The Tm motor operator modules for C60 circuit breakers can be either:
  - Electrically operated, or
  - Locally operated by a manual operating handle
- Electrical accessories from the CT contactor line allow the following types of control:
  - By impulse and/or electrical latch: ACTc
  - Time-delayed: ACTt
  - By BatiBUS network: ATB1s
- Electrical accessories from the C60 circuit breaker line allow:
  - Indication of tripping on a fault with an SD alarm switch
  - Indication of the “open” or “closed” position of the circuit breaker with an OF auxiliary switch
- The selector switch located on the front panel is used to:
  - Disconnect the motor operator
  - Free the padlocking device in the “open” position (0.28 in. [7 mm] dia. padlock, not supplied)
- Mechanical indicator:
  - Red: Tm motor operator is energized or is being opened
  - Gray: Tm motor operator is not energized or is completely opened
- Remote resetting:
  - Reclosing after a fault must be carried out primarily in manual mode and locally after verification and clearance of the fault. Imposing manual and local resetting, an SD alarm switch, Cat. No. MG26928 (26927), wired in series in the control line of the Tm module, prevents automatic and remote reclosing.
  - Resetting takes place by opening the control circuit for a time greater than two seconds

Technical Characteristics

- Voltage: 230 Vac (-15% +10%)
- Frequency: 50/60 Hz
- Consumption:
  - Inrush: 28 VA
  - Holding: 2 VA
- Insensitive to short-supply interruptions less than 0.45 seconds
- Undervoltage response:
  - > 0.45 second—mechanical opening of poles
  - reclosing two seconds after power is restored
- Mechanical indicator flag for status indication
- Number of cycles for Tm motor operator and C60 circuit breaker combination: 20,000 at 104°F (40°C)
- Opening time:
  - 0.5 sec. by Tm motor operator
  - 0.05 sec. by shunt trip or undervoltage release
- Closing time: 2 seconds
- Rate of operation: 15 sec. max. up to 10 operations per day
- Tunnel terminals are suitable for #10 AWG (6 mm^2) cables

Possible Accessory Combinations

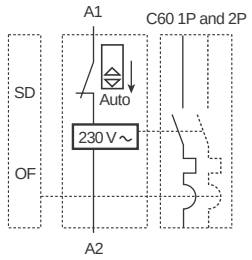
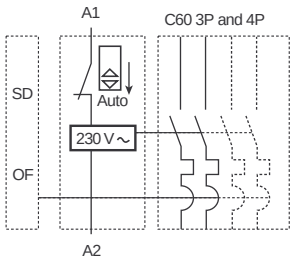
Accessories are mounted to the left of the circuit breaker for a total width of 2.13 in. (54 mm) max.



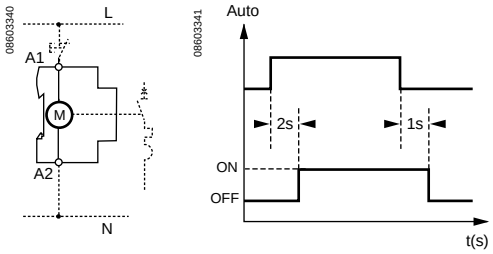
SD Alarm Switch + **OF Auxiliary Switch** + **Tm Motor Operator** + **C60 Circuit Breaker** + **C60 Vigi Module**

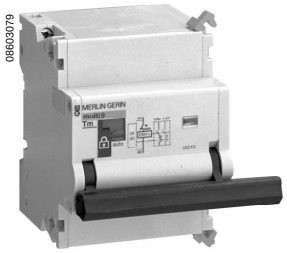
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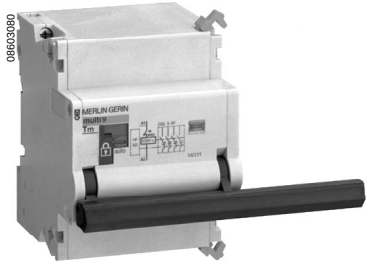
	Poles	Voltage	Width in Modules	Cat. No.
	1 + 2	230 Vac	7	MG18310
	3 + 4	230 Vac	7	MG18311

NOTE: Width of one module = 0.354 in. (9 mm).





Motor Operator
1P + 2P



Motor Operator
3P + 4P

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Rotary Handle

- Front or lateral operation of NC100 2P, 3P and 4P circuit breaker versions
- Degree of protection:
  - IP54 as per IEC 529 (see page 83)
  - NEMA12 and 3R
- IEC Rated; not UL Recognized
- Installation:
  - On door or hinged panel for draw-out rotary handle Cat. No. MG27047
  - On fixed front or side panel with fixed rotary handle Cat. No. MG27048
- A complete rotary handle is made up of a circuit breaker operating subassembly and a handle

Description	Cat. No.
Circuit breaker operating subassembly (fixed to circuit breaker)	27046
Draw-out extended handle (mounted on door or hinged panel)	27047
Fixed handle front or lateral (mounted on fixed panel)	27048

Front Mounting Kit

- To be used on 1P, 2P, 3P and 4P devices
- Option: Can be used with Cat. No. MG26981 sealable screw shields for extra clearance on 480 V applications

Front Mounting Kit	Cat. No.
Bracket for 1P	26983
Bracket for 2P	26984
Bracket for 3P	26985
Bracket for 4P	26989

Multi-pole Front Mounting Kit

Consists of a transparent hinged weatherproof cover with DIN rail. Allows installation of 20 modules of MULTI 9 circuit breakers.

- Degree of protection as per IEC 529: IP55
- Dimensions:
  - Overall: 4.96 x 9.25 x 1.30 in. (126 x 235 x 33 mm)
  - Cutout: 3.78 x 7.32 in. (96 x 186 mm)

Multiple-pole Front Mounting Kit	Cat. No.
Hinged transparent cover (includes a ten-module divisible blanking plate and a mounting template).	14210
DIN-rail support	14211

Spacer

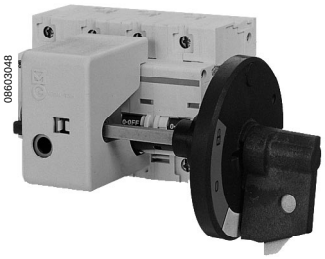
- Clips on DIN rail
- Provides a ventilation gap to prevent overheating
- Provides space for future circuit breakers

Description	Cat. No.
Width = 0.354 in. (9 mm)	27062

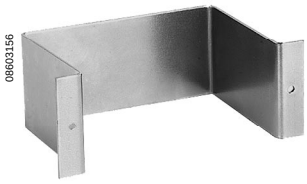
Identification System

- Marking symbols can be used on each of the poles of all C60 miniature circuit breakers.
- The following symbols are available: Blank, 0–9, +, – and A–Z

Identification System	Cat. No.
(Bag of ten)	27150



Rotary Handle



Front Mounting Kit



Multi-pole Front Mounting Kit



Spacer



Identification System

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Terminal Cover

- Completely covers terminals
- Enables rear connection
- Includes a sealing device

Description	Cat. No.
1P	26975
2P	26976
3P	26975, 26976
4P	26978

Terminal Screw Shield

- Enables total isolation of the device terminal screws

Description	Cat. No.
For NC100H supplementary protector (bag of two)	26981

Label Holder

- Used to identify the 2P, 3P or 4P devices on the toggle

Label Holder	Cat. No.
(Bag of ten)	27150

Plug-in Base

- For no-load isolation of a circuit protected by a miniature circuit breaker with locking in “disconnected” position using 0.315 in. (8 mm) diameter padlocks, not supplied

Description	Cat. No.
For 1P C60 supplementary protector (minimum center spacing of 7.87 in. [200 mm] between two rows).	26996

Padlock Attachment

- This device may be used to lock the circuit breaker in “on” or “off” position by 0.315 in (8 mm) diameter padlocks, not supplied. The front plate or functional door can be opened with the circuit breaker locked in “off” position.
- Due to the trip-free mechanism, padlocking in the “on” position will not prevent the circuit breaker from tripping under overcurrent or ground-fault conditions.

Padlock Attachment	Cat. No.
For NC100 supplementary protector (bag of two)	27145



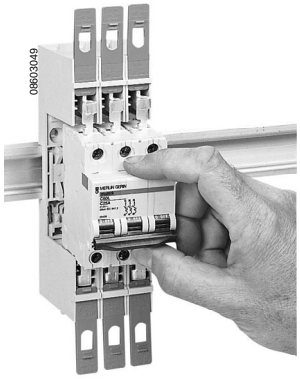
Terminal Cover



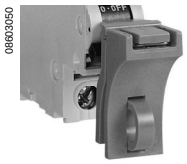
Terminal Screw Shield



Label Holder



Plug-in Base



Padlock Attachment

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MSC Mounting Base

- Rating: 250 A
- 2-phase and 3-phase
- Insulation voltage: 690 Vac
- Tested to Australian AS3439-1 and AS3439-3 standards
- Withstand ratings:
  - Peak: 52.5 kA
  - Short-time: 25 kA for 0.1 sec.

Type	Pole Capacity	Length (in./mm)	Cat. No.
MSC DC—Suitable for C60 Circuit Breakers			
2-phase (black, red)	12	4.33/110 (1)	325123
	16	5.75/146 (1)	325183
	20	7.17/182 (1)	325243
MSC 18—Suitable for C60 Circuit Breakers			
3-phase (red, white, blue)	12	4.33/110	3DC123
	18	6.46/164	3DC163
	24	8.58/218	3DC203

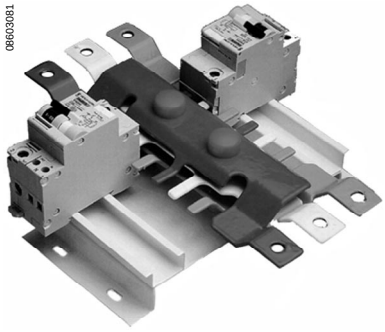
(1) Bus bars extend 2.66 in. (67.5 mm) from both ends of pan; width is 8.46 in. (215 mm).

Comb Bus Bars

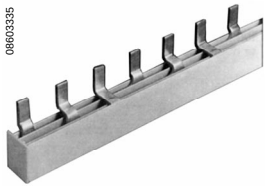
Type		Cat. No.
12 poles	1-phase	14881
	2-phase	14882
	3-phase	14883
	4-phase	14884
24 poles (set of two)	1-phase	14891
	2-phase	14892
	3-phase	14893
	4-phase	14894

Connector and Caps

Type		Cat. No.
Connector #4 AWG (25 mm^2)		14885
Extra end caps (40 pieces)	1-phase/2-phase	14886
	1-phase/2-phase	14887
Tooth caps (40 pieces)		14888



Multi 9 Mounting Base



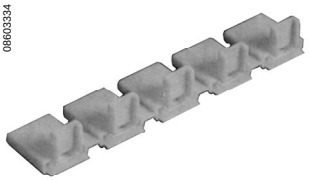
Comb Bus Bar



Connector



End Cap



Tooth Cap

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Description

C32H-DC circuit breakers are used in circuits with a dc power supply (emergency lighting, automatic systems, electrolysis, telephony, etc.)

- The C32H-DC circuit breakers combine the following functions:
  - Protection of circuit against short circuit currents
  - Protection of circuits against overload currents
  - Control
  - Isolation

Standard Features

- Number of operating cycles (O–C): 10,000 at L/R ≤ 0.015 sec.
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C)

Time-Current Curves

C Curve—Overcurrent protection for all application types:

- Ratings: 1–40 A set at 104°F (40°C)
- Tripping curve: The magnetic releases operates between 7 and 10 I_n

Interrupting Ratings

Type	Rating (A) at 104°F/40°C	Number of Poles	Voltage (Vac/Vdc)	Interrupting Rating (A)
C32H-DC	1–40	1P	127 Vac	10,000
		2P	127 Vac	20,000
		2P	250 Vac	10,000

Accessories

The same accessories (listed below) as the NC100 circuit breakers can be added to the C32H-DC circuit breaker (see page 38).

- Padlocking device
- Auxiliary switch
- Alarm switch
- Shunt trip
- Undervoltage release

Connection

- #6 AWG (16 mm^2) flexible cables, or
- #4 AWG (25 mm^2) rigid cables

C Curve—C32H-DC Circuit Breakers

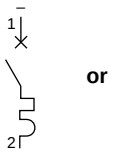
Rating (A)	1P	2P
	2 Modules	4 Modules
1	MG20531	MG20541
2	MG20532	MG20542
3	MG20533	MG20543
6	MG20534	MG20544
10	MG20535	MG20545

Rating (A)	1P	2P
	2 Modules	4 Modules
16	MG20536	MG20546
20	MG20537	MG20547
25	MG20538	MG20548
32	MG20539	MG20549
40	MG20540	MG20550

NOTE: Width of one module = 0.354 in. (9 mm).



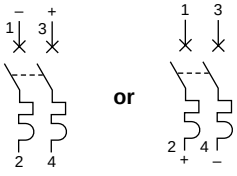
1P Circuit Breaker



Line Side Feeding **Load Side Feeding**



2P Circuit Breaker



Line Side Feeding **Load Side Feeding**

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Standard Features

- Fast closing: Allows increased withstand to the high inrush currents of some loads
- Trip-free mechanism: Contacts cannot be held in the on position when the circuit breaker is tripped automatically
- Isolation with positive break indication: Green strip on the circuit breaker operating handle indicates that all poles are open
- Number of operating cycles (O–C): 20,000
- Degree of protection as per IEC 529 (see page 83):
  - Case: IP40
  - Terminals: IP20
- Tropicalization: Treatment 2 (relative humidity: 95% at 131°F/55°C)
- Temperature:
  - Operation: 23 to 140°F (–5 to 60°C)
  - Storage: –40 to 212°F (–40 to 100°C)
- Identification: Each device comes with a label holder

Compliance with Standards

- IEC 947-2
- CE Marked

Interrupting Ratings

Type	Rating (A) at 104°F/40°C	Number of Poles	Voltage (Vac)	Interrupting Rating (A)
NC100H	10–100	1P	230–240	10,000
			415	4,000 (1)
		2P/3P/4P	230–240	20,000
			400–415	10,000
			440	6,000
NC125H	125	1P	415	4,000 (1)
		2P/3P/4P	230	20,000
			400–415	10,000
NC100LS	10–63	1P	220–240	36,000 (1)
		2P/3P/4P	220–240	70,000
			380–415	36,000
NC100LH	10–63	1P	220–230	50,000
			240	40,000
			400	12,500
			415	10,000 (1)
		2P/3P/4P	220–230	100,000
			400	50,000
			415	40,000
			440	30,000

(1) Single-pole interrupting rating for IT type European grounding system (insulated neutral—double fault).

Time-Current Curves

B Curve—Overcurrent protection for generators, very long cables, etc.:

- Tripping curve: the magnetic release operates between 3.2 and 4.8 I_n

C Curve—Overcurrent protection for cables supplying standard loads:

- Tripping curve: the magnetic release operates between 7 and 10 I_n

D Curve—Overcurrent protection for loads with high inrush currents (motors, transformers etc.):

- Tripping curve: the magnetic release operates between 10 and 14 I_n

Weights (oz./g)

Type	1P	2P	3P	4P
NC100H	6.35/180	12.70/360	19.05/540	25.40/720
NC125H	—	—	19.05/540	25.40/720
NC100LS	6.35/180	12.70/360	19.05/540	25.40/720
NC100LH	6.35/180	12.70/360	19.05/540	25.40/720

Connection

Type	Flexible Cables	Rigid Cables
NC100H	#3 AWG (35 mm^2)	#1 AWG (50 mm^2)
NC125H	—	#1 AWG (50 mm^2)
NC100LS	#4 AWG (25 mm^2)	#3 AWG (35 mm^2)
NC100LH	#4 AWG (25 mm^2)	#3 AWG (35 mm^2)

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B Curve—NC100H and NC125H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27201	27212	27223	27234
16	27202	27213	27224	27235
20	27203	27214	27225	27236
25	27204	27215	27226	27237
32	27205	27216	27227	27238
40	27206	27217	27228	27239

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
50	27207	27218	27229	27240
63	27208	27219	27230	27241
80	27209	27220	27231	27242
100	27210	27221	27232	27243
125	27211	27222	27233	27244

C Curve—NC100H and NC125H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27245	27256	27267	27278
16	27246	27257	27268	27279
20	27247	27258	27269	27280
25	27248	27259	27270	27281
32	27249	27260	27271	27282
40	27250	27261	27272	27283

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
50	27251	27262	27273	27284
63	27252	27263	27274	27285
80	27253	27264	27274	27286
100	27254	27265	27276	27287
125	27255	27266	27277	27288

D Curve—NC100H and NC125H Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27289	27300	27311	27322
16	27290	27301	27312	27323
20	27291	27302	27313	27324
25	27292	27303	27314	27325
32	27293	27304	27315	27326

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
40	27294	27305	27316	27327
50	27295	27306	27317	27328
63	27296	27307	27318	27329
80	27297	27308	27319	27330
100	27298	27309	27320	27331

NOTE: Width of one module = 0.354 in. (9 mm).



1P **2P** **3P** **4P**

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C Curve—NC100LS Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27377	27388	27399	27410
16	27378	27389	27400	27411
20	27379	27390	27401	27412
25	27380	27391	27402	27413

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
32	27381	27392	27403	27414
40	27382	27393	27404	27415
50	27383	27394	27405	27416
63	27384	27395	27406	27417

D Curve—NC100LS Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27421	27432	27443	27454
16	27422	27433	27444	27455
20	27423	27434	27445	27456
25	27424	27435	27446	27457

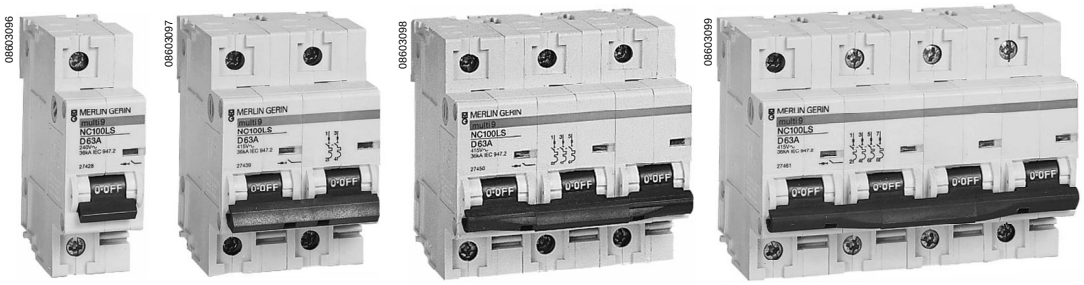
Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
32	27425	27436	27447	27458
40	27426	27437	27448	27459
50	27427	27438	27449	27460
63	27428	27439	27450	27461

C Curve—NC100LH Circuit Breakers

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
10	27509	27520	27531	27542
16	27510	27521	27532	27543
20	27511	27522	27533	27544
25	27512	27523	27534	27545

Rating (A)	1P	2P	3P	4P
	3 Modules	6 Modules	9 Modules	12 Modules
32	27513	27524	27535	27546
40	27514	27525	27536	27547
50	27515	27526	27537	27548
63	27516	27527	27538	27549

NOTE: Width of one module = 0.354 in. (9 mm).



1P 2P 3P 4P

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IEC Rated NC100 Vigi Module for Ground-fault Protection

Description

The MULTI 9 NC100 Vigi module is an electromechanical device which operates without an auxiliary supply source. The Vigi NC100 module incorporates the residual current relay and the toroid in the same case.

Vigi modules complete the NC100 2P, 3P and 4P circuit breakers to provide:

- Protection of people against indirect contact
- Additional protection of people against direct contact (30 mA)
- Protection of electrical installations against insulation faults

Standard Features

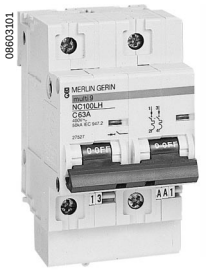
- Complies with IEC 947-2 Standard
- The NC100 circuit breaker and Vigi module combination is protected against nuisance tripping due to transient overvoltages such as lightning, switching on the network, etc.
- The AC class Vigi module guarantees tripping for sinusoidal ac residual currents, either suddenly applied or slowly increasing
- Total vertical discrimination with the $I_{\Delta n}$ 300 mA to 1 A Ⓢ “selective” sensitivities if it is installed:
  - Upstream from an instantaneous residual current device
  - Downstream from an index II, time-delayed residual current device, where in both cases the $I_{\Delta n}$ of the downstream device ≤ $I_{\Delta n/2}$ of the upstream device
- Voltage: 220–415 Vac, +10%, –20%, 50/60 Hz
- Current rating: 100 A
- Instantaneous or selective tripping: fixed sensitivities for all ratings
- Resetting the NC100 circuit breaker and Vigi module combination in a single operation by resetting the circuit breaker
- Mechanical indication of the ground-fault is shown on the front face of the Vigi module with a red indicator

Weights (oz./g)

Type	2P	3P	4P
Vigi NC100	14.82/420	19.75/560	25.40/720

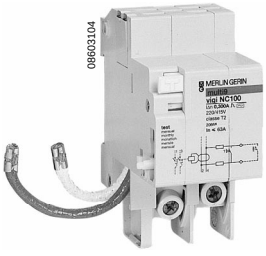
Connection

Rating (A)	Type	Cable Size	
≤100	Flexible	#2 AWG	35 mm²
	Rigid	#1 AWG	50 mm²



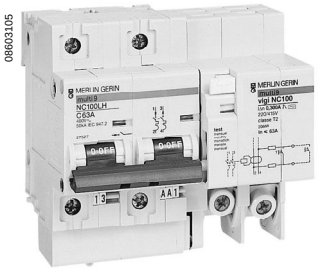
NC100 Circuit Breaker

+



Vigi Module

=



Residual Current Circuit Breaker

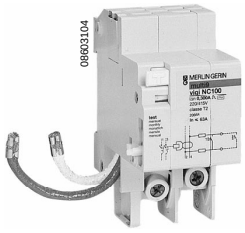
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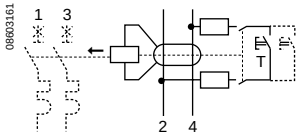
AC Class—NC100 Vigi Module

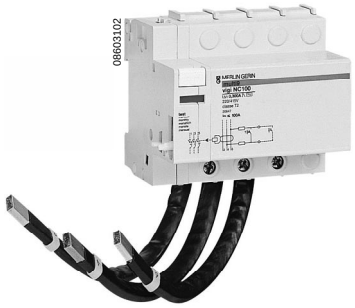
Rating (A)	Voltage (Vac)	Sensitivity (mA)	2P	3P	4P
			7 Modules	10 Modules	10 Modules
≤100	220–415	30	27818	27826	27835
		300 Ⓢ	27823	27831	27840
		1000 Ⓢ	27825	27833	27842

NOTE: Width of one module = 0.354 in. (9 mm).

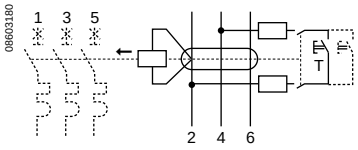


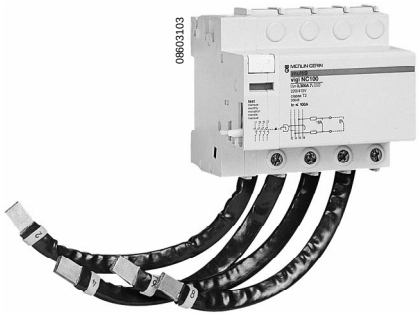
2P



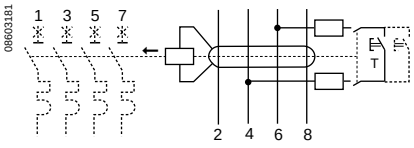


3P





4P



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Remote Tripping

Remote tripping is possible by means of an MX shunt trip or MN undervoltage release. A tripped circuit breaker is indicated by a red flag visible on the front panel.

- ■ MX + OF shunt trip—When energized, trips the associated circuit breaker
  - □ Is equipped with a cut-off switch
  - □ Is equipped with an O + F switch that indicates the “open” or “closed” position of the circuit breaker
- ■ MN undervoltage release—When voltage drops to 70–35% of the supply voltage, the associated circuit breaker trips and is prevented from reclosing until the supply voltage is restored
  - □ Complies with NF and IEC Standards
  - □ Uses emergency stop via push button
  - □ Uses safety feature on circuit supplying several machines preventing uncontrolled restarting of the motors
- ■ MN Ⓢ time-delayed undervoltage release—Undervoltage release controlling opening of the circuit breaker with which it is associated. Allows a 0.5 second time delay on a short supply interruption of voltage drop.

Power Consumption of MX and MN Accessories

Type	Voltage	VA or W
MX (inrush)	220–240 Vac	50
	48–130 Vac	200
	110–130 Vdc	10
	48 Vac/Vdc	22
	24 Vac/Vdc	120
MN (holding)	220–240 Vac	2.3
	48/130 Vac	2.2
	110/130 Vac	2.0
	48 Vac/Vdc	2.0
	24 Vac/Vdc	2.3
MN Ⓢ (holding)	220–240	4.1

Remote Indication

- ■ OF Auxiliary Switch—Indicates the “open” or “closed” position of the circuit breaker
- ■ SD Alarm Switch—Indicates the “tripped-on-fault” position of the circuit breaker with a red indicator flag on the front panel
- ■ Operation—A test button allows simulation of the OF and SD functions without operating the circuit breaker

Electrical Ratings

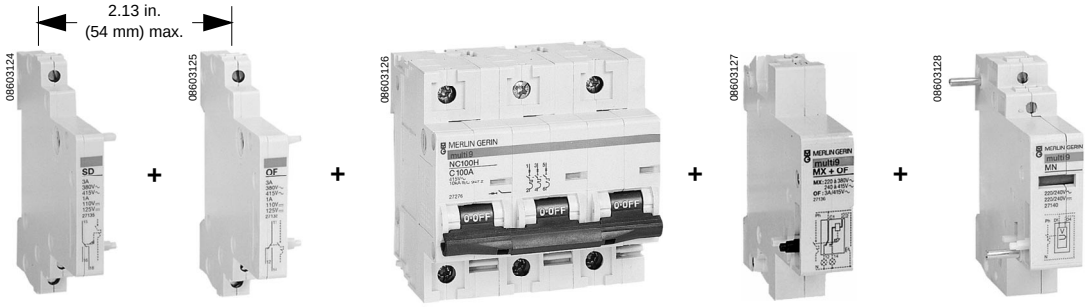
Voltage	Breaking Capacity (A)
415 Vac	3
≤ 240 Vac	6
130 Vdc	1
≤ 48 Vdc	2
≤ 24 Vdc	6

Connection

- ■ Terminal screws for two #16 AWG (1.5 mm^2) cables, or
- ■ Terminal screws for one #14 AWG (2.5 mm^2) cable

Possible Accessory Combinations

Accessories are mounted to the left of the circuit breaker for a total width of 2.13 in. (54 mm) max.



SD Alarm Switch

OF Auxiliary Switch

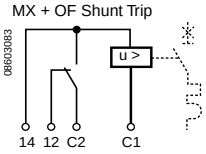
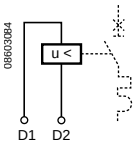
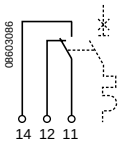
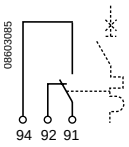
NC100H Circuit Breaker

MX + OF Shunt Trip and Auxiliary Switch

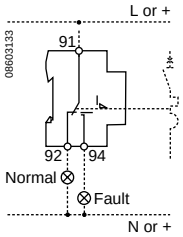
MN Undervoltage Release

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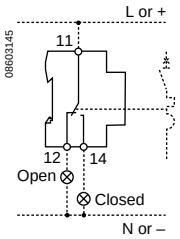
Type		Control Voltage		Width in Modules	Cat. No.	
		Vac	Vdc		UL/IEC	IEC
MX + OF Shunt Trip		24–48	24–48	2	MG27130	27138
		110–220	110–130	2	MG27129	27137
		220–277	—	2	MG27128	—
		220–415	—	2	—	27136
MN Undervoltage Release	Instantaneous	110–130	—	2	MG27126	—
		220–240	—	2	MG27125	27140
		220–240	220–240	2	—	27140
	Time-delayed	220–240	220–240	2	—	27143
OF Auxiliary Switch				1	MG27121	27132
						
SD Alarm Switch				1	MG27122	27135
						

NOTE: Width of one module = 0.345 in. (9 mm).



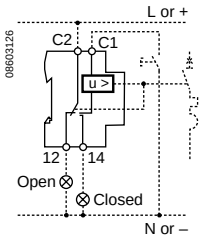


SD Alarm Switch



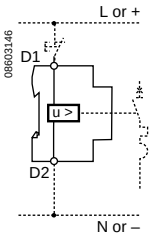


OF Auxiliary Switch





MX + OF Shunt Trip and Auxiliary Switch





MN Undervoltage Release

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Rotary Handle

- Front or lateral operation of NC100 2P, 3P and 4P circuit breaker versions.
- Degree of protection:
  - IP54 as per IEC 529 (see page 83)
  - NEMA12 and 3R
- IEC Rated
- Installation:
  - On door or hinged panel for draw-out rotary handle Cat. No. MG27047
  - On fixed front or side panel with fixed rotary handle Cat. No. MG27048
- A complete rotary handle is made up of a circuit breaker operating subassembly and a handle

Description	Cat. No.
Circuit breaker operating subassembly (fixed to circuit breaker)	27046
Draw-out extended handle (mounted on door or hinged panel)	27047
Fixed handle front or lateral (mounted on fixed panel)	27048

Front Mounting Kit

- To be used on 1P, 2P, 3P and 4P devices.
- Option: Can be used with Cat. No. 27152 sealable screw shields for extra clearance on 480 V applications

Front Mounting Kit	Cat. No.
Bracket for 1P	26986
Bracket for 2P	26987
Bracket for 3P	26988
Bracket for 4P	26990

Multi-pole Front Mounting Kit

Consists of a transparent hinged weatherproof cover with DIN rail. Allows installation of 20 modules of MULTI 9 circuit breakers

- Degree of protection as per IEC 529: IP55
- Dimensions:
  - Overall:
    4.96 x 9.25 x 1.30 in. (126 x 235 x 33 mm)
  - Cutout: 3.78 x 7.32 in. (96 x 186 mm)

Multiple-pole Front Mounting Kit	Cat. No.
Hinged transparent cover (includes a ten module divisible blanking plate and a mounting template).	14210
DIN-rail support	14211

Spacer

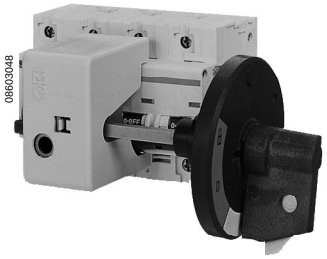
- Clips on DIN rail
- Provides a ventilation gap to prevent overheating
- Provides space for future circuit breakers

Description	Cat. No.
Width = 0.354 in. (9 mm)	27062

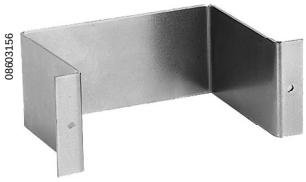
Identification System

- Marking symbols may be used on each of the poles of all NC100H circuit breakers.
- The following symbols are available:
  Blank, 0–9, +, – and A–Z

Identification System	Cat. No.
(Bag of ten)	27150



Rotary Handle



Front Mounting Kit



Multi-pole Front Mounting Kit



Spacer



Identification System

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Terminal Cover

- Completely cover terminals
- Enables rear connection

Description	Cat. No.
1P (set of two)	27151

Terminal Screw Shield

- Enables total isolation of the device terminal screws

Description	Cat. No.
For NC100H supplementary protector (Bag of two)	27152

Label Holder

- Used to identify the 2P, 3P or 4P devices on the toggle

Label Holder	Cat. No.
(Bag of ten)	27150

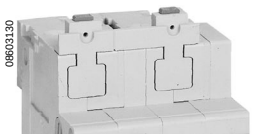
Padlock Attachment

- This device may be used to lock the circuit breaker in “on” or “off” position using 0.315 in. (8 mm) diameter padlocks, not supplied. The front plate or functional door can be opened with the circuit breaker locked in “off” position.
- Due to the trip-free mechanism, padlocking in the “on” position will not prevent the circuit breaker from tripping under overcurrent or ground-fault conditions.

Padlock Attachment	Cat. No.
For NC100 supplementary protector (Bag of two)	27145



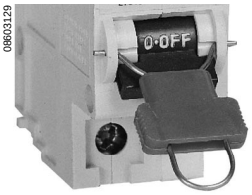
Terminal Cover



Terminal Screw Shield



Label Holder



Padlock Attachment

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MSC Mounting Base

- Rating: 250 A
- 2-phase and 3-phase
- Insulation voltage: 690 Vac
- IEC Rated; not UL Recognized. Tested to Australian AS3439-1 and AS3439-3 Standards
- Withstand ratings:
  - Peak: 52.5 kA
  - Short-time: 25 kA for 0.1 sec

Description	Pole Capacity	Length (in./mm)	Cat. No.
MSC 27—Suitable for NC100 Circuit Breakers			
3-phase (red, white, blue)	12	164 (1)	125123
	18	245 (1)	125183
	24	326 (1)	125243

(1) Bus bars extend 2.66 in. (67.5 mm) from both ends of pan, width is 8.46 in. (215 mm).

Comb Bus Bars

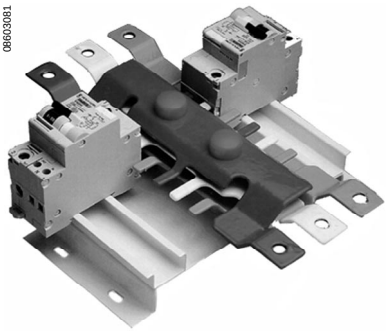
- Voltage: 480 Vac
- Rated current: 200 A
- Available in 1-, 2-, 3- and 4-phase
- Distance between poles: 1.06 in. (27 mm)

Type		Cat. No.
9 poles	1-phase	MG10293
	2-phase	MG10294
	3-phase	MG10295
	4-phase	MG10296
3.28 ft. (1 m) (36 poles)	1-phase	MG10297
	2-phase	MG10298
	3-phase	MG10299
	4-phase	MG10300

Connector and Caps

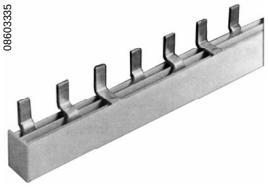
Type	Cat. No.
Connector #2 AWG (35 mm^2)	MG10307
Extra end caps (40 pieces)	MG10305
Tooth caps (40 pieces)	MG10306

08603081



MSC Mounting Base

08603335



Comb Bus Bar

08603336



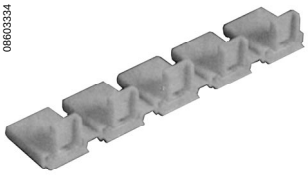
Connector

08603333



End Cap

08603334



Tooth Cap

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Description

The residual current release is electromechanical and operates without any auxiliary source of supply.

Functions

Residual current switches combine the following functions:

- Switch
- Automatic circuit interruption in the event of an insulation fault between phase and ground greater than or equal to 10, 30 or 300 mA. Residual current circuit breakers are used in the residential, tertiary and industrial sectors.

Standard Features

- Compliance with standards:
  - IEC 1008
  - EN 61-008
  - CE Marked
- Provides protection against nuisance tripping due to transient overvoltages (lightning, switching on the network, etc.)
- Level of immunity: 250 A peak according to 8/20 ms periodical wave
- Voltage: 240 to 415 Vac, +10% –20%, 50/60 Hz
- Current rating: 25 to 100 A
- AC class
- Disconnection with positive contact indication
- Reinforced short-circuit current withstand
- Number of operating cycles (O-C): 20,000
- Instantaneous or selective release S. Selective release allowing total vertical coordination with a downstream 30 mA ID residual current switch
- Manual operation via handle
- Indication:
  - Mechanical: the ground fault is displayed on the front face by a mechanical indicator
  - Electrical: using SD auxiliary switch (supplied separately)
- Environment: Treatment 2 (relative humidity 95% at 131°F/55°C).

Weight (oz./g)

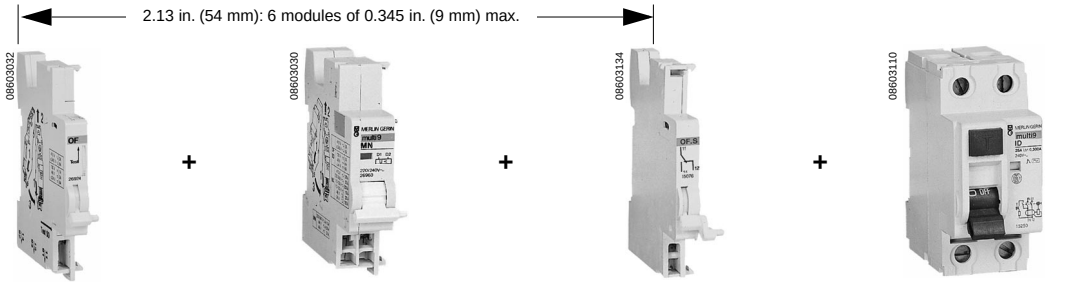
Type	2P	4P
ID Circuit Breaker	8.1/230	15.9/450

Connection

- #2 AWG (35 mm^2) flexible cables, or
- #1 AWG (50 mm^2) rigid cables

Accessories

The same electrical accessories as the C60 circuit breakers can be added by using an OFS adapter (Cat. No. 26923).



OF Auxiliary Switch and/or SD Alarm Switch

MX Shunt Trip and/or MN Undervoltage Release

OFS Auxiliary Switch

Residual Current Switch

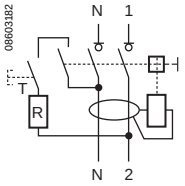
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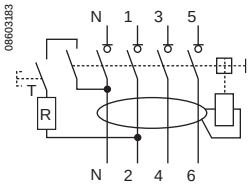
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AC Class—ID Residual Current Switches

Rating (A)	Sensitivity (mA)	2P 240 Vac	4P 415 Vac
		4 Modules	8 Modules
25	10	16200	—
	30	16201	16251
40	30	16204	16254
63	30	16208	16258
	300 S	23028	16265
80	30	16212	—
	300 S	23032	16266
100	300	23034	—
	300 S	23035	23059

NOTE: Width of one module = 0.354 in. (9 mm).







2P



4P

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Standard Features

- Degree of pollution: 3
- Isolating voltage: 500 Vac
- Impulse voltage: 6 kV
- Degree of protection: IP 4 on the front panel (see page 83)
- Frequency: 50/60 Hz
- Isolation with positive contact indication
- DC application: 48 V (110 V with two series-connected poles)
- Mechanical Endurance:
  - I = 20 and 32 A: 20,000 operating cycles
  - I = 40 and 63 A: 20,000 operating cycles
- Electrical Endurance:
  - I = 20 and 32 A: 30,000 cycles
  - I = 40 and 63 A: 20,000 cycles
  - I = 100 A: 10,000 cycles
  - I = 125 A: 2,500 cycles
- Short-circuit withstand: 20 x I_n: 1 second
- Tropicalization: Treatment 2 (relative humidity 95% at 141°F/155°C).

Compliance with Standards

- I switch—20, 32, 40 and 63 A:
  - EN 60669-1
  - IEC 669-1
- I switch— 40, 63, 100 and 125 A:
  - IEC 947-3

Connection

Rating/Device	Type	Cable Size	
20, 32 A	Flexible/Rigid	#8 AWG	10 mm^2
40, 63, 100, 125 A	Flexible	#3 AWG	35 mm^2

Accessories

- Auxiliary switch (Cat. No. 15096)
- Breaking capacity:
  - 3 A at 400 Vac
  - 6 A at 230 Vac

The same accessories as the C60 circuit breaker can be used.:

- Terminal screw shield
- Terminal cover
- Rotary operating handle
- Padlock attachment
- Comb bus bars

I Switches

Rating (A)	1P— 250 Vac	2P—415 Vac	2P—440 Vac	3P—415 Vac	3P—440 Vac	4P—415 Vac	4P—440 Vac
	2 Modules	2 Modules	4 Modules	4 Modules	6 Modules	4 Modules	8 Modules
20	15005	15006	—	15007	—	15008	—
32	15009	15010	—	15011	—	15012	—
40	15024	—	15020	—	15023	—	15019
63	15013	—	14014	—	15015	—	15016
100	15090	—	15091	—	15092	—	15093
125	15057	—	15058	—	15059	—	15060

NOTE: Width of one module = 0.354 in. (9 mm).



1P
I Switch



2P
I Switch



3P
I Switch



4P
I Switch

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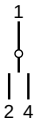
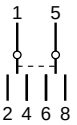
Standard Features

- Voltage rating: 250 Vac
- Current rating: 20 A
- Electrical durability: 30,000 AC22 operating cycles
- Complies with Standard NF C 61-110
- Tropicalization: Treatment 2

Connection

- Tunnel terminals for cables up to #8 AWG (10 mm^2)

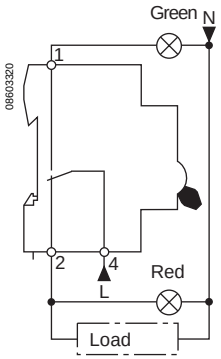
Catalog Numbers

Type	Number of Circuits	Number of Positions	Width in Modules	Cat. No.
	1	2	2	15102
	1	3	2	15103
	2	2	4	15129
	2	3	4	15130
	2	2	4	15131

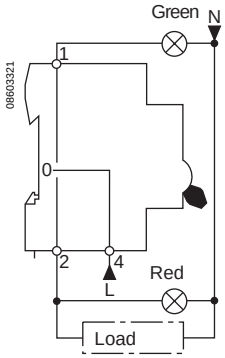
NOTE: Width of one module = 0.354 in. (9 mm).



CM
Selector Switch



Two Position



Three Position

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Surge arresters are designed to protect electronic and electrical equipment against overvoltages due to lightning and industrial switching impulses.

The choice of surge arrester model depends on the level of exposure to overvoltages and by assessing the consequences of overvoltages on the loads to be protected.

Description

Surge arresters are designed to conduct the current resulting from an overvoltage which exceeds a permissible voltage threshold (U_c).

- On standby: In the absence of any overvoltage, the surge arrester has a very high impedance and has no effect on the installation.
- In operation: The surge arrester discharges and conveys high shock currents throughout the duration of the electrical disturbance. It greatly reduces the voltage at the load terminals to a given protection level (U_p).
- Flow capacity: 20 shocks at I_n (I nominal) and one shock at $I_{max.}$ (I maximum)
- Surge arrester end of life is indicated by a red mechanical light for the PE range (with operating reserve for the PE65)
- Each surge arrester in the range has a specific purpose:
  - The PE 65 surge arrester is recommended for very high risks (very exposed sites).
  - The PE 40 is recommended for high risks.
  - The PE 15 is recommended for average risks.
  - The PE 8 is used for fine protection in the presence of very sensitive loads. It must be used in coordination with an upstream PE 65, PE 40 or PE 15 surge arrester.
- Indication by mechanical indicator with a power reserve:
  - White: Normal operation
  - White/Red: Surge arrester needs replacing quickly on PE 65 only
  - Red: surge arrester MUST be replaced

⚠ CAUTION

HAZARD OF EQUIPMENT DAMAGE

Surge arresters provide no overcurrent protection and must be protected by a corresponding upstream MULTI 9 circuit breaker shown in the table below.

Failure to observe this precaution can cause equipment damage.

Surge Arrester	Upstream Circuit Breaker Protection and Disconnection		Flow Capacity (kA)			Protection Level U_p (kV)	Width in Modules	Cat. No.
			I nom. 8/20 µs	I max. 8/20 µs	I max. 4/10 µs			
PE 65	C60	50 A C Curve	20	65	100	2	2	15683
	NC100	50 A C Curve						
PE 40	C60	50 A C Curve	10	40	65	1.8	2	15686
PE 15	C60	50 A C Curve	5	15	25	1.8	2	15691
PE 8	C60	50 A C Curve	2	8	15	1.5	2	15694

Standard Features

- Complies with the NF C 61-740 Standard (1995)
- IEC Rated: Not UL Recognized
- U_c: max. continuous voltage: 440 Vac
- I_c: continuous operating current:< 1 mA
- Self-protection by built-in thermal disconnection, with indication of end of life by mechanical indicator
- Response time: < 25 ns
- Phase/neutral/ground connection:
  - #4 AWG (25 mm^2) rigid and #6 AWG (16 mm^2) flexible cables
- Phase/neutral/ground min. cross-section:
  - #10 AWG (4 mm^2) without lightning conductor
  - #8 AWG (10 mm^2) with lightning conductor
- Temperature:
  - Operation: –13 to 140°F (–25 to 60°C)
  - Storage: –40 to 185°F (–40 to 85°C)



PE 65
Surge Arrester



PE 40
Surge Arrester



PE 15
Surge Arrester

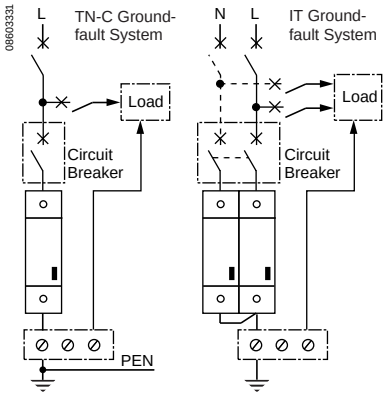


PE 08
Surge Arrester

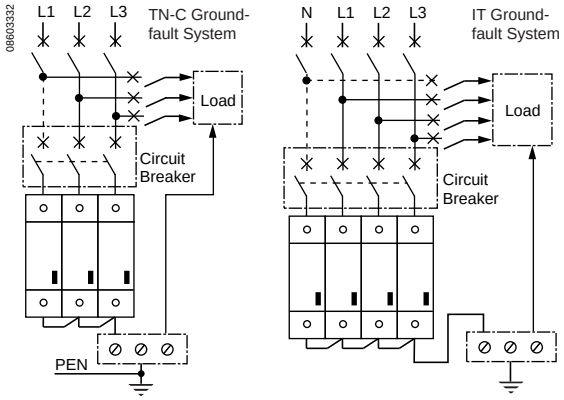
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Wiring Diagrams



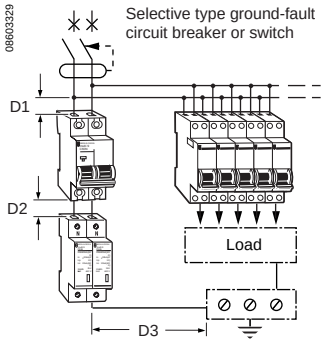
1-Phase System



3-Phase System

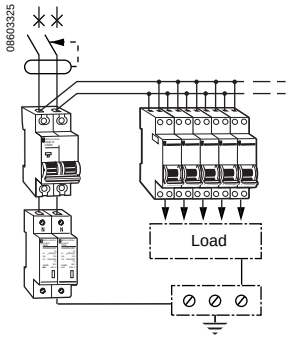
Wiring Guidelines

- The connection between the surge arrester and the circuit breaker must be no greater than 20 in. (50 cm).

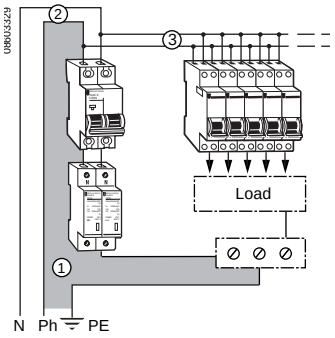


Distance D1+D2+D3 ≤ 20 in. (50 cm)

- The outgoing feeders of the protected conductors must be connected at the terminals of the surge arrester and circuit breaker.



- The phase, neutral and PE incoming wires must be tightly coupled to reduce the loop surface (1).
- The surge arrester's incoming wires (2) must be moved away from the outgoing wires (3) to avoid mixing the unprotected cables with the protected cables.



- The cables must be flattened against the metallic frames of the box in order to minimize the frame loops and thus benefit from a disturbance screening effect. If the box is made of plastic and the loads are particularly sensitive, it must be replaced by a metal box.

  In all cases the metalic frames of the boxes or cabinets must be checked to ensure they are frame grounded by very short connections.

  Finally, if screened cables are used, extra lengths which serve no purpose (pigtails, etc.) must be cut off as they reduce screening effectiveness.

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Description

The CH hour counter is used for counting hours of circuit operation.

The CI impulse counter is an electromechanical counter designed to measure impulses emitted by detectors such as kilowatt-hour metering, temperature overrun, etc., and displays the running total of metered impulses. The CI impulse counter is unaffected by interruptions in the main power supply.

CH Hour Counter Standard Features

- For connection downstream of a circuit breaker
- Maximum counting: 99,9999.99 hours

Connection

- Tunnel terminals for #12 AWG (2.5 mm^2) cable

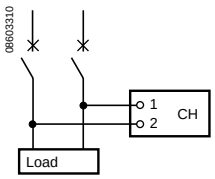
CI Impulse Counter Standard Features

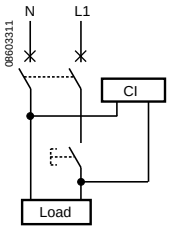
- Voltage: 230 V ±10%, 50/60 Hz
- Consumption: 0.05 W
- Electromechanical Display: 999,999 impulses
- Meter Frequency:
  - Minimum impulse time: 50 ms
  - Minimum time between two impulses: 50 ms
- Operating temperature:
  - 14 to 140°F (–10 to 60°C)

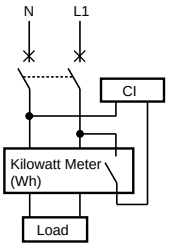
Connection

- Tunnel terminals for #12 AWG (2.5 mm^2) cable

Type	Voltage (Vac)	Frequency (15% to +6%)	Width in Modules	Cat. No.
CH	220–240	50 Hz	4	15440
CI	220–240	50/60 Hz	4	15443









CH Hour Counter



CI Impulse Counter

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Standard Features

- ■ Complete signal lamp:
  - □ 230 Vac neon bulb and lens
  - □ E10 or BA9s bulb cap
  - □ Removable
- ■ Maximum power of bulbs: < 1.2 W:
  - □ Bulb extractable without tool

Connection

- ■ Tunnel terminals for cables up to #8 AWG (10 mm^2)

Type	Voltage	Color	Width in Modules	Cat. No.
Complete V Signal Lamp				
	230 Vac	Clear	2	15106
		Red	2	15107
		Green	2	15108
		Yellow	2	15109
		Blue	2	15110
V Signal Lamp without Bulb or Lens				
			2	15142
Accessories				
Lens (bag of five)		Clear		15143
		Red		15144
		Green		15145
		Yellow		15146
		Blue		15141
Bulbs (bag of ten)	230 Vac	Clear Red, Yellow (1)		15115
		Blue, Green (1)		15116
	48 Vac/Vdc	All		15117
	24 Vac/Vdc	All		15118
	12 Vac/Vdc	All		15119

(1) According to lens color.



V Signal Lamps

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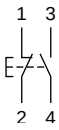
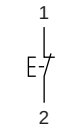
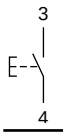
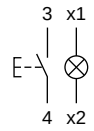
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Standard Features

- Voltage rating: 250 Vac
- Current rating: 20 A
- Mechanical durability: 300,000 operations
- Electrical durability: 30,000 operations
- NF USE approved
- Complies with IEC 669-1 Standard
- Tropicalization: Treatment 2
  (relative humidity: 95% at 131°F/55°C)
- Signal lamp with interchangeable neon bulb:
  - 0.8 mA
  - 230 Vac
  - 1.2 W max.
  - Base fitting: E10 or BA9s

Connection

- Tunnel terminals up to #8 AWG (10 mm^2)

Type		Voltage	Signal Lamp Color	Push Button Color	Width in Modules	Cat. No.
Push Buttons without Signal Lamps						
	1 O + 1 C		—	Gray	2	15104
	1 C		—	Red	2	15136
	1 O		—	Green	2	15137
Push Buttons with Signal Lamp						
	1 C		Red	Red	2	15138
	1 O		Green	Green	2	15105
Accessories						
Bulb (Bag of ten)		230 Vac	Green			15115
			Red			15116
		48 Vac/Vdc	All			15117
		24 Vac/Vdc	All			15118
		12 Vac/Vdc	All			15119
Lens (Bag of five)			Green			15143
			Red			15144



Push Buttons without Signal Lamps



Push Buttons with Signal Lamps

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Applications

- Extension enclosure for individual and institutional housing
- Subdistribution enclosure in service sector buildings
- Rated current: 63 A

Standard Features

- Material:
  - Insulating, self-extinguishing material
  - White color
- Standards:
  - International IEC 439.3
  - French NF C61.910
- Degree of protection as per IEC 529 (see page 83): IP 40
- Degree of protection against mechanical impacts as per EN 50.102: IK 07
- Class 2: Total insulation
- Behavior in fire and abnormal heat as in IEC 695.2.1 in accordance with ERP and IGH (high-rise building) regulations

Construction

- Back with a central hole to simplify installation and two oblong holes for leveling. Punch-out holes on the top, bottom and back surfaces enable cable insertion throughout. Axis placed on the back/front panel parting line ensures easy, neat punch-outs using pliers.
- Metal rail centered at mid-height, and sufficiently far from the back to enable wire insertion
- Rigid, sealable, front panel
- Plain or transparent, rounded and flush door
  - A key lock is optional

Enclosures (one row with transparent door)

Number of Modules		Dimensions (in./mm)			Cat. No.
0.354 in. (9 mm)	0.709 in. (18 mm)	H	L	D	
8	4	7.91/201	4.41/112	3.70/94	13326
12	6	7.91/201	5.83/148	3.70/94	13327
16	8	7.91/201	7.24/184	3.70/94	13328
24	12	7.91/201	10.01/256	3.70/94	13329

Accessories Included

- Sloping terminal block support to simplify cable insertion and improve accessibility on clamping
- Terminal block equipped with guides to simplify cable introduction in tunnels
  - Four holes for 4- and 6-module enclosures: (2) x 0.016 sq. in. (10 mm^2) + (2) x 0.025 sq. in. (16 mm^2)
  - Eight holes for 8- and 12-module enclosures: (4) x 0.016 sq. in. (10 mm^2) + (4) x 0.025 sq. in. (16 mm^2)
- Built-in divisible blanking plate: two modules
- Identification strip
- Four sealing plugs for wall fastening screws (essential for Class 2)

Accessory Type	Cat. No.
Sealing kit	13326
Key lock	13327
Extra terminal block for ground or neutral	13328
Ten extra blanking plates dividable per module of 0.354 in. (9 mm)	13329



Mini PRAGMA DIN-type Enclosures

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Applications

- Extension enclosure for service sector and industrial buildings
- Subdistribution enclosure for distribution
- Installation for harsh or humid environments (farm buildings, sawmills, garages, etc.)

Standard Features

- Material:
  - Insulating, self-extinguishing material
  - Light grey color
- Standards:
  - International IEC 439.3
  - French NF C61.910
- Degree of protection as per IEC 529 (see page 83): IP 65
- Degree of protection against mechanical impacts as per EN 50.102: IK 07
- Class 2: Total insulation
- Fire withstand capacity: 1382°F/750°C

Construction

- Back with a central hole to simplify installation and two oblong holes for leveling. Punch-out holes on the four side surfaces and back enables cable insertion throughout. Axis placed on the back/front panel parting line ensures easy, neat punch-outs using pliers.
- Metal rail removed from the back to allow the wires to pass through
- Rigid, sealable front panel
- Transparent, rounded and flush door
  - A key lock is optional

Enclosures (one row)

Number of Modules		Dimensions (in./mm)			Cat. No.
0.354 in. (9 mm)	0.709 in. (18 mm)	H	L	D	
6	3	7.05/200	3.70/105	3.95/112	10503
8	4	7.05/200	4.34/123	3.95/112	10504
12	6	7.05/200	5.61/159	3.95/112	10506
16	8	7.05/200	6.88/195	3.95/112	10508
24	12	7.05/200	9.42/267	3.95/112	10512

Accessories Included

- Sloping terminal block support to simplify cable insertion and improve accessibility on clamping
- Terminal block equipped with guides to simplify cable introduction in tunnels
  - Four holes for 3-, 4- and 6-module enclosures: (2) x 0.016 in. sq. (10 mm^2) + (2) x 0.025 in. sq. (16 mm^2)
  - Eight holes for 8- and 12-module enclosures: (4) x 0.016 in. sq. (10 mm^2) + (4) x 0.025 in. sq. (16 mm^2)
- Built-in divisible blanking plate: Two modules
- Identification strip
- Four sealing plugs for wall fastening screws (essential for Class 2)

Accessory Type	Cat. No.
Sealing kit	14185
Key lock	14180
Extra terminal block for ground or neutral	13576
Ten extra blanking plates divisible per module of 0.354 in. (9 mm)	13429



Mini PRAGMA Weatherproof Type Enclosures

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Applications

- Indoor enclosures
- Creation of subdistribution boards for small and medium service sector buildings (hotels, offices, shops) and switchboards for medium and large residential installations
- Switchboard rated current: 160 A

Standard Features

- Material:
  - Metal back
  - Ivory color
- Standards:
  - International IEC 439.3
  - French NF C61.910
- Degree of protection against mechanical impacts as per IEC 529 (see page 83):
  - Enclosure without door: IP 30
  - Enclosure with door: IP 31D
  - Degree of protection against mechanical shocks as in EN 50 102: IK 08
- Insulation:
  - Class 1: Standard
  - Class 2: Total insulation
  - Fire and abnormal heat withstand in accordance with regulations for buildings open to the public (BOP) and high-rise buildings (HRB)

Composition

- Metal back (fully insulated for Class 2 enclosures), with removable chassis
- One insulated front panel frame
- Insulated modular front plates
- Insulated plates with knockouts

Accessories Included

- One ground/neutral (2) 30-hole terminal blocks:
  (14) x 0.016 in. sq. (10 mm^2) +
  (15) x 0.025 in. sq. (16 mm^2) +
  (1) x 0.054 in. sq. (35 mm^2)
- Terminal block equipped with guides to simplify cable introduction in tunnels
- Eight module divisible blanking plates:
  - Two blanking plates for one, two and three row enclosures
  - Four blanking plates for four, five and six row enclosures
- Label with protective cover for each row

Enclosures

Number of Rows	Number of Modules		Dimensions (in./mm)			Cat. No.
	0.354 in. (9 mm)	0.709 in. (18 mm)	H	W	D	
1	48	24	11.81/300	21.65/550	6.69/170	13811
2	96	48	17.72/450	21.65/550	6.69/170	13812
3	144	72	23.62/600	21.65/550	6.69/170	13813
4	192	96	29.53/750	21.65/550	6.69/170	13814
5	240	120	35.43/900	21.65/550	6.69/170	13815
6	288	144	41.34/1050	21.65/550	6.69/170	13816



PRAGMA F DIN-type Enclosures

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Enclosure Door

- IP 41 guaranteed by a foam seal delivered as standard
- Direct front mounting on the frame without dismantling of the frame
- Reversible door: right-hand or left-hand opening. Optional 405 key lock.

Number of Rows	Cat. No.	
	Plain	Transparent
1	13841	13851
2	13842	13852
3	13843	13853
4	13844	13854
5	13845	13855
6	13846	13856

Accessories	Cat. No.
RONIS PROTEC™ 405 key lock	13877
Ivory spray paint	13880

Terminal Block

Capacity is given for rigid cables with (2) 30 holes:
(14) 0.016 in. sq. (10 mm^2) +
(15) 0.025 in. sq. (16 mm^2) +
(1) 0.054 in. sq. (35 mm^2)

Dimensions	H	W	D
Inch/mm	2.36/60	9.84/250	1.97/50

Type	Cat. No.
Extra ground/neutral terminal block	13876

Mounting Plate

The perforated mounting plate replaces a symmetrical rail and can be fitted with non-modular products behind the plain front trim.

Type	Cat. No.
Plain front trim (one row)	13871
Modular front trim (one row)	13872
Perforated mounting plate H=5.91 in. (150 mm)	13864

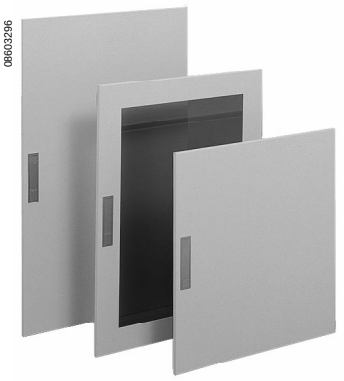
Blanking Plate

Accessories	Cat. No.
Divisible blanking plate (5 x 18 mm modules), set of ten, ivory color	13429
Strip blanking plate (24 x 18 mm modules), ivory color	13430

COMPACT® NS Incoming Kit

- For installation of an incoming COMPACT NS circuit breaker up to 160 A
- Kit includes mounting and front plates
- Takes one row

Accessory	Cat. No.
COMPACT NS incoming kit	13863



Enclosure Doors



Terminal Block

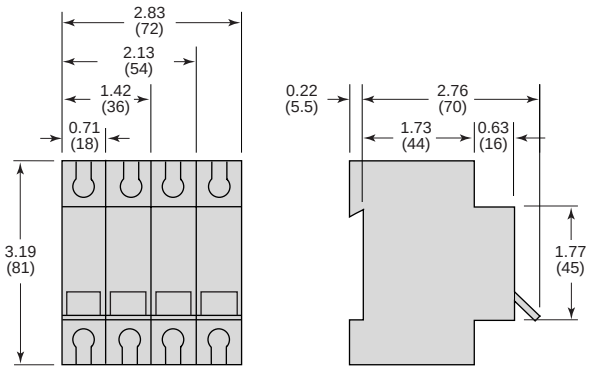


Mounting Plate and Trim

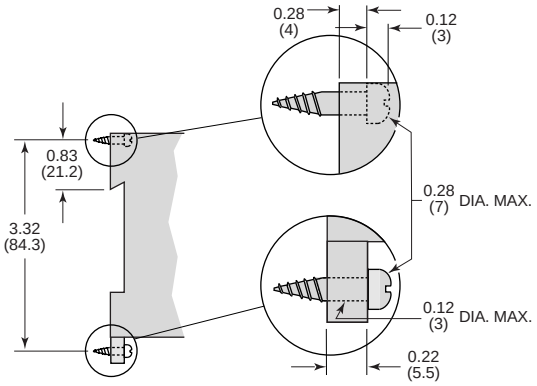
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C60 Supplementary Protectors and Circuit Breakers

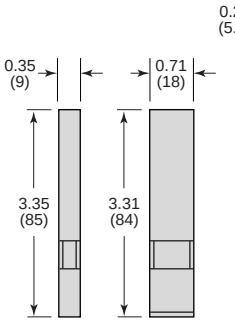


1, 2, 3 and 4-Pole



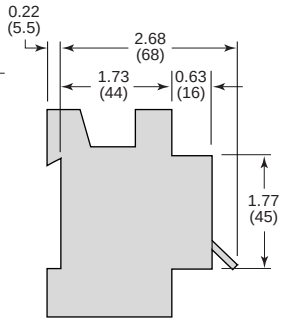
Surface Mounting

Accessories

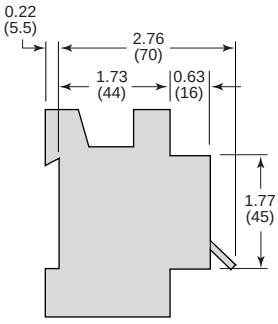


OF, SD

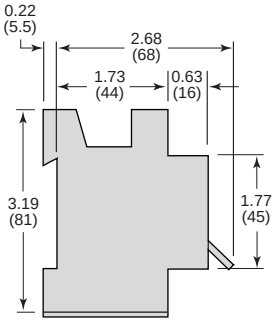
MX, MN



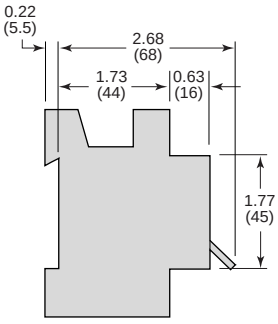
OF Auxiliary Switch



SD Alarm Switch

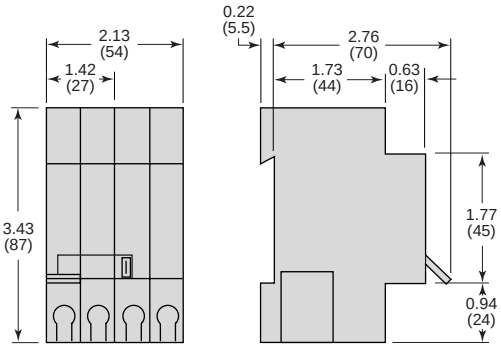


MX Shunt Trip

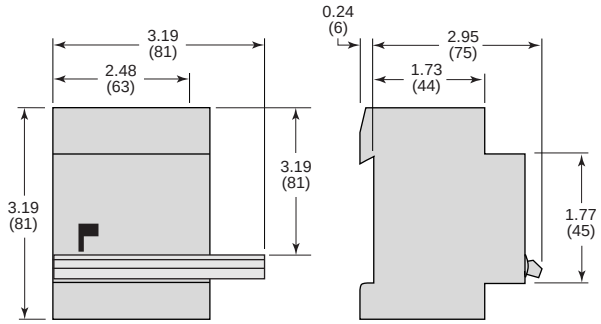


MN Undervoltage Release

Vigi Ground-fault Modules



Tm Motor Operator

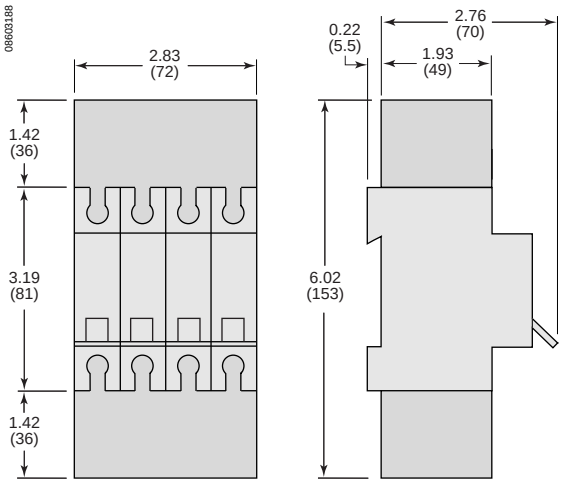


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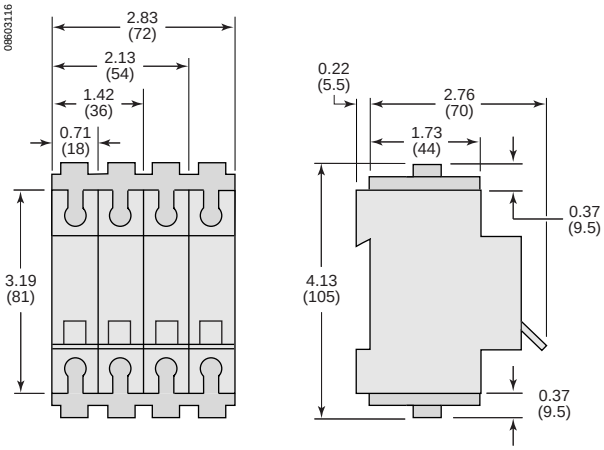
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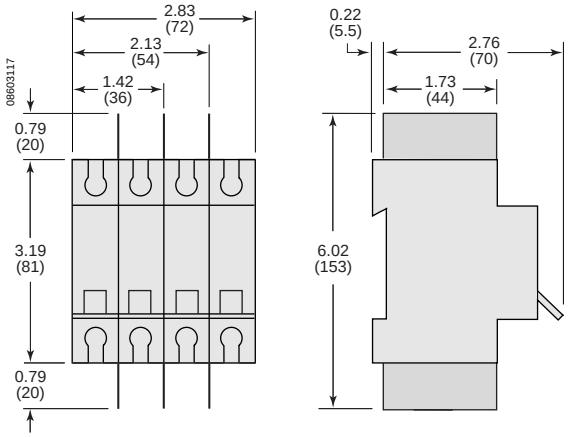
C60 Terminal Cover



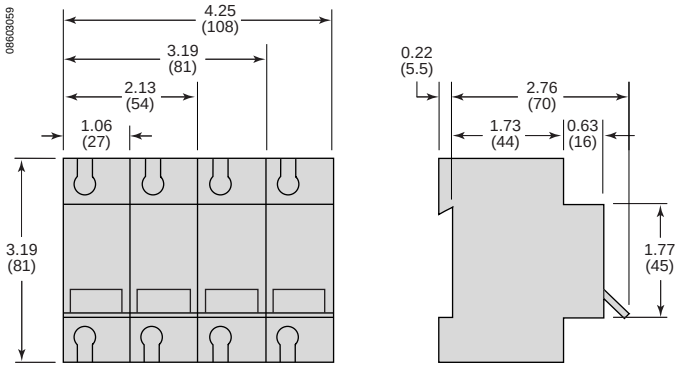
C60 Terminal Screw Shield



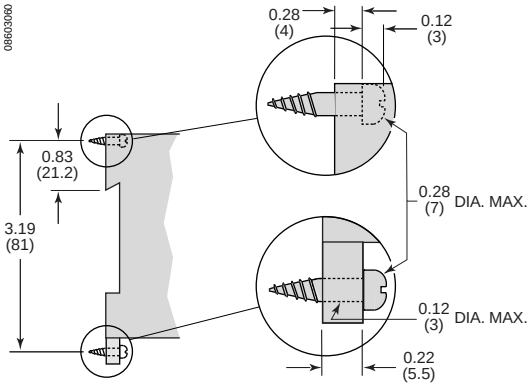
C60 Interphase Barriers



NC100 and NC125 Supplementary Protectors and Circuit Breakers



1P/2P/3P/4P



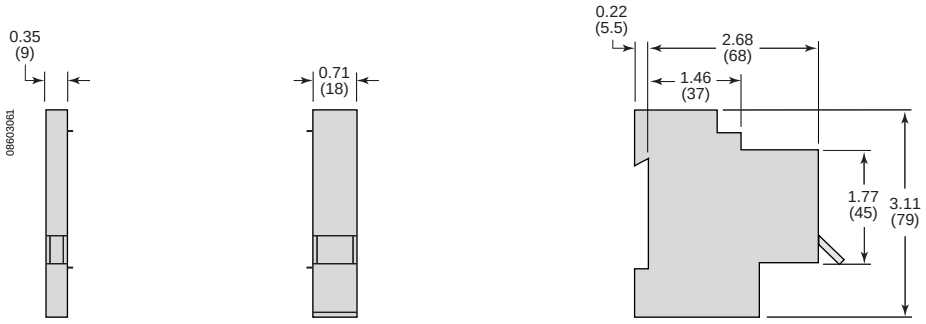
Surface Mounted

Dimensions: in. (mm)

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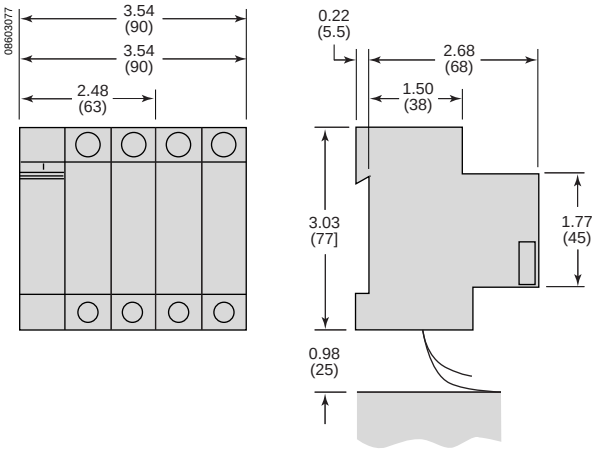
NC100 Accessories



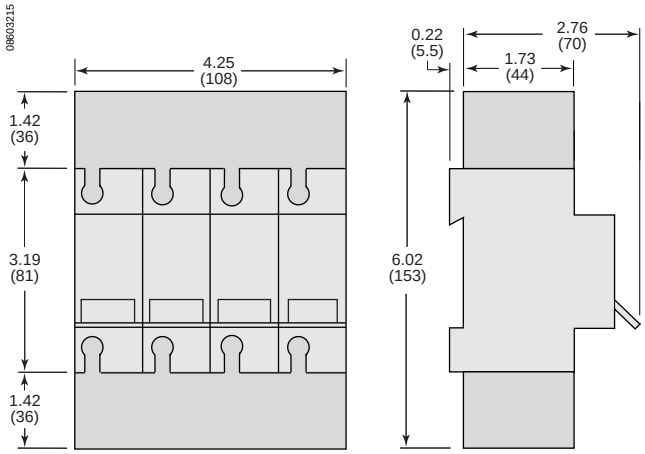
OF Auxiliary Switch and SD Alarm Switch

MX Shunt Trip and MN Undervoltage Release

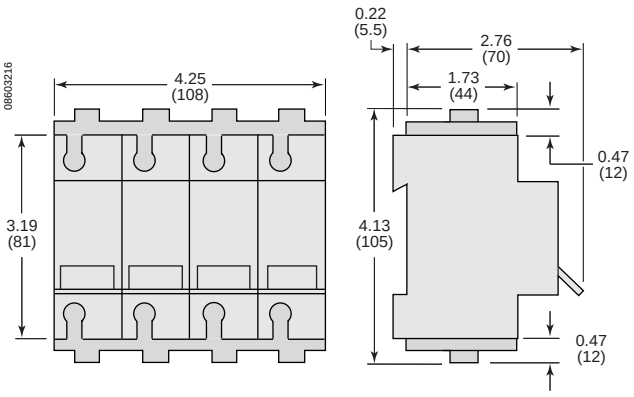
NC100 Vigi Ground-fault Module



NC100 Terminal Cover



NC100 Terminal Screw Shield

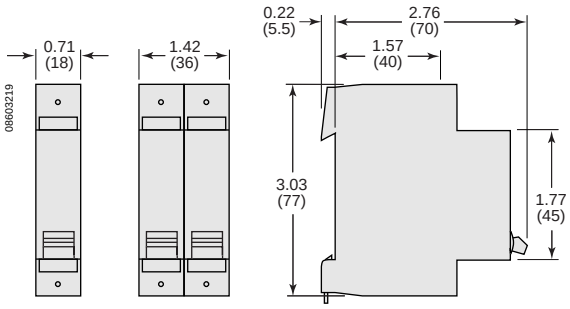


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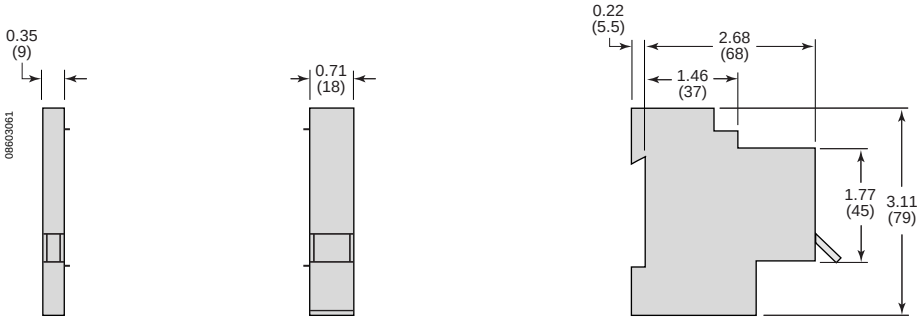
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C32H-DC Circuit Breakers



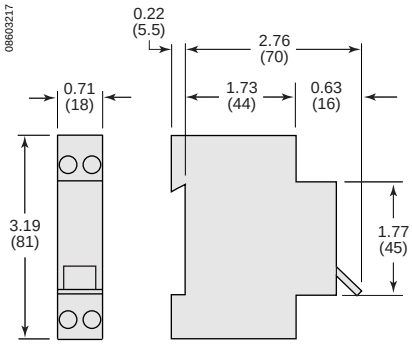
C32H-DC Accessories



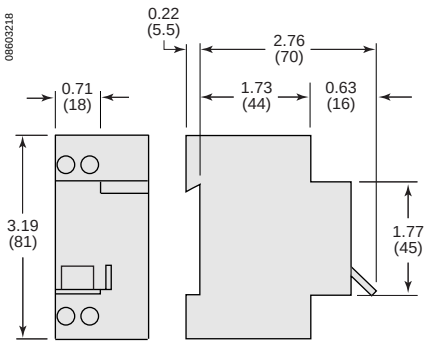
OF Auxiliary Switch and SD Alarm Switch

MX Shunt Trip and MN Undervoltage Release

DPN-N Circuit Breakers



DPN-N Vigi Circuit Breakers

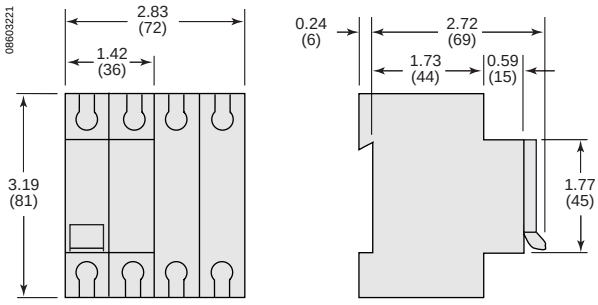


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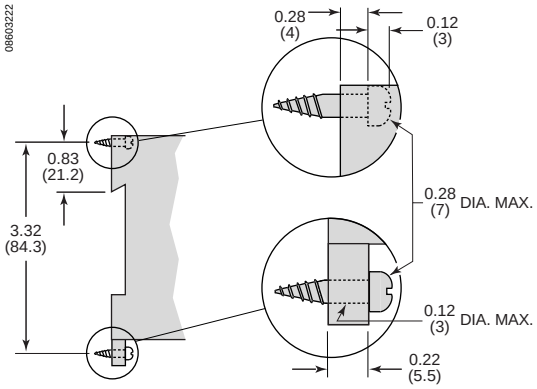
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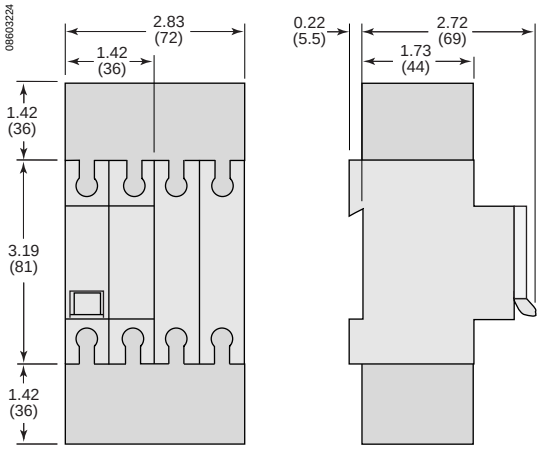
ID Residual Current Switch



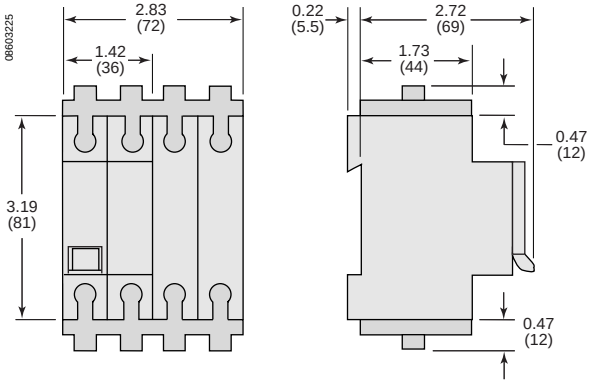
Surface Mounting



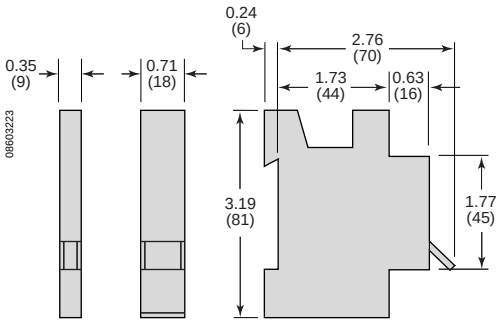
ID Terminal Cover



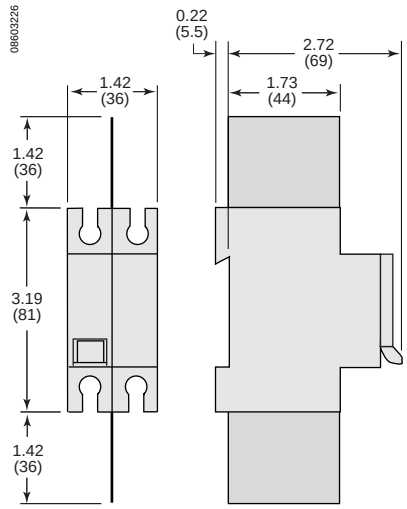
ID Terminal Screw Shield



ID OF, MX and MN Accessories



ID Interphase Barrier

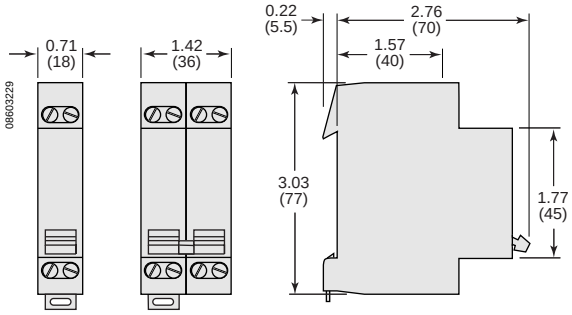


Dimensions: in. (mm)

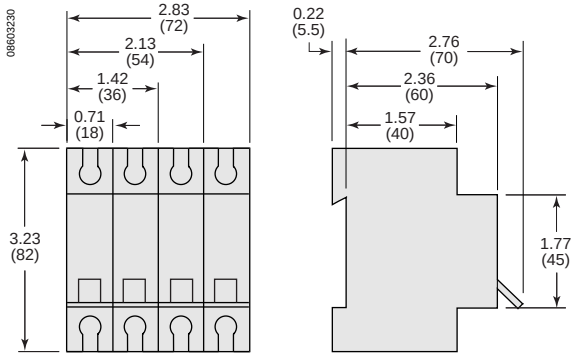
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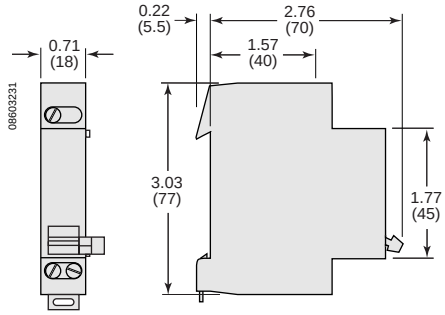
I Switch (20–32 A)



I Switch (40–125 A)

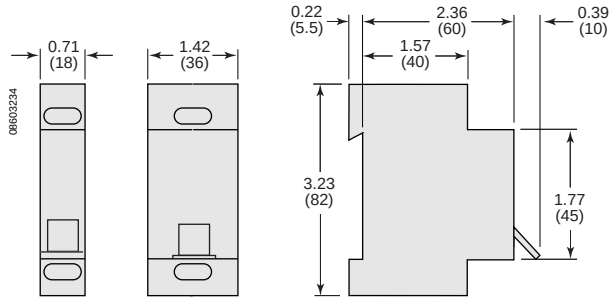


I Switch Accessories



Auxiliary Switch

CM Switches



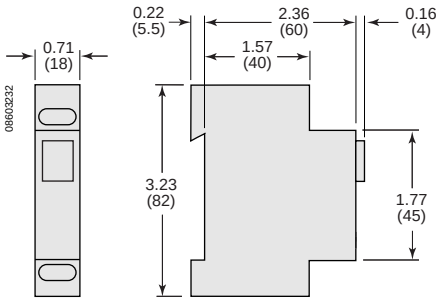
1-Circuit **2-Circuit**

Dimensions: in. (mm)

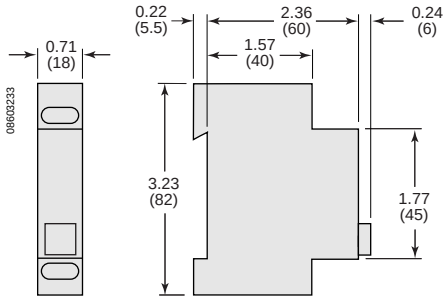
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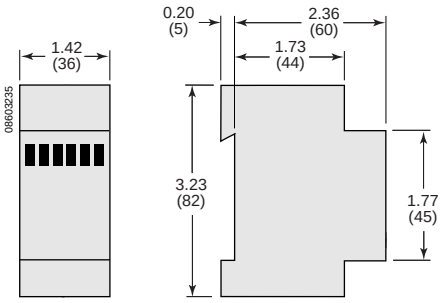
V Signal Lamps



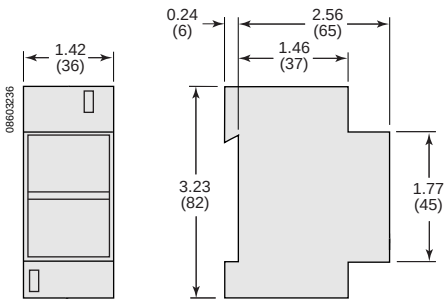
BP Push Buttons



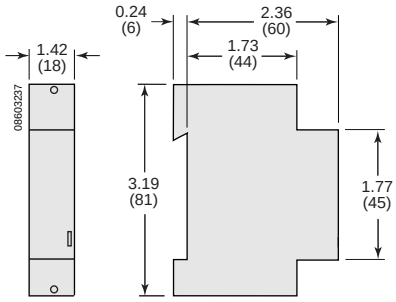
CI Impulse Counter



CH Hour Counter



PE Surge Arresters

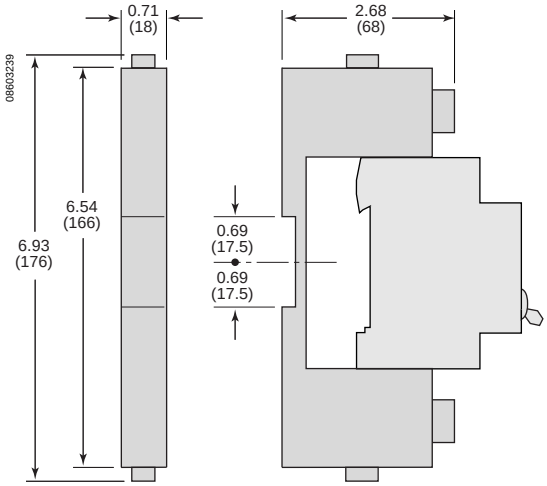


Dimensions: in. (mm)

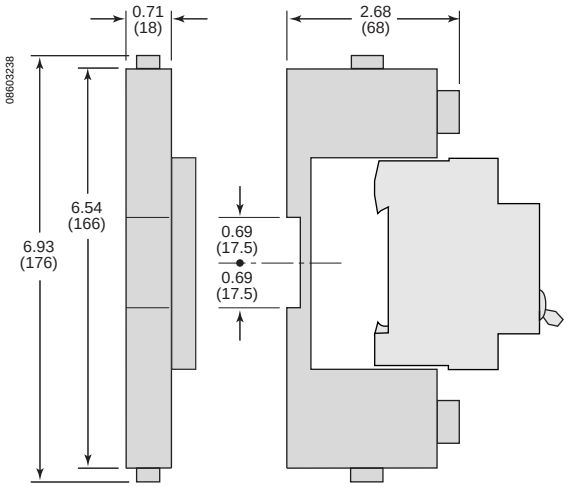
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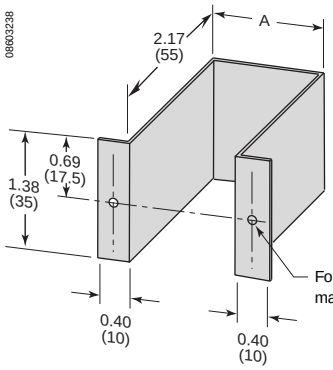
C60 Plug-in Base



NC100H Plug-in Base

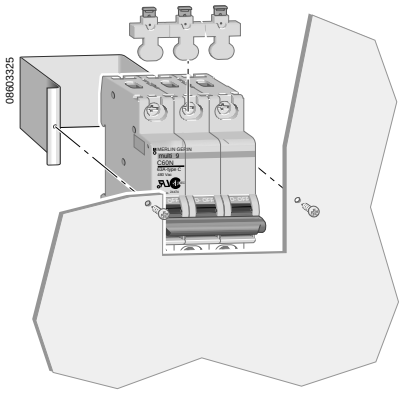


C60 and NC100H Front Mounting Kit

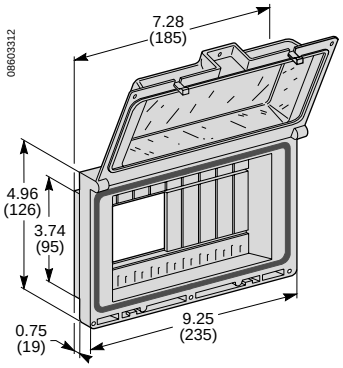


	A (in./mm)
1P	1.10/28
2P	2.16/55
3P	3.23/82
4P	4.29/109

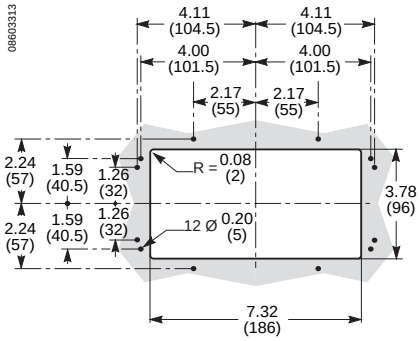
Mounting Example



Multi-pole Front Mounting Kit



Front Mounting Kit Dimensions



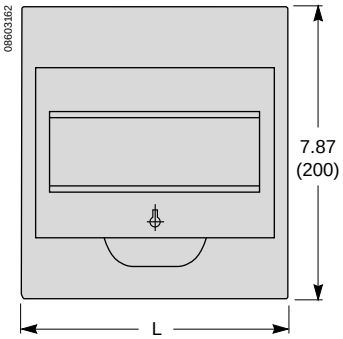
Cutout Dimensions

Dimensions: in. (mm)

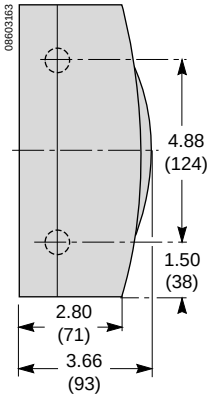
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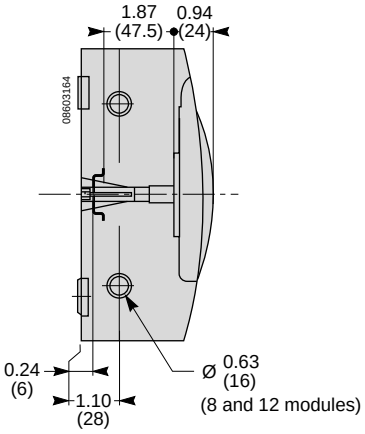
Mini PRAGMA™ DIN-type Enclosures



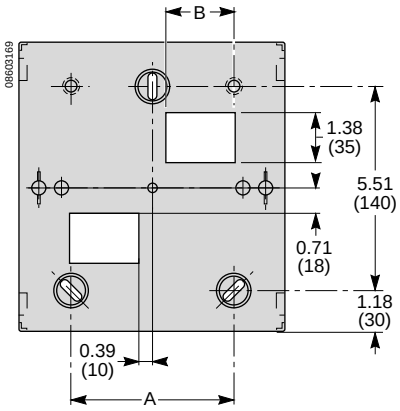
Front View



Side View

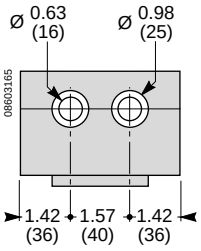


Rail Position

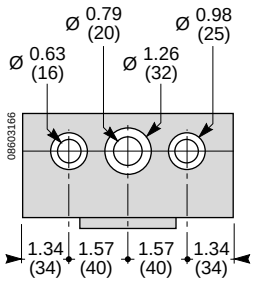


Wall Mounting

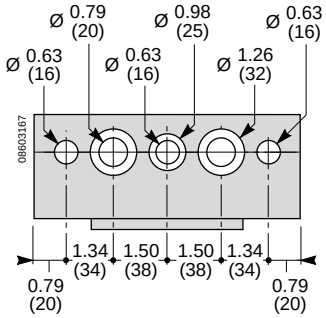
	A	B	L
4 Modules	—	20	112
8 Modules	—	35	148
8 Modules	88	50	184
12 Modules	160	75	256



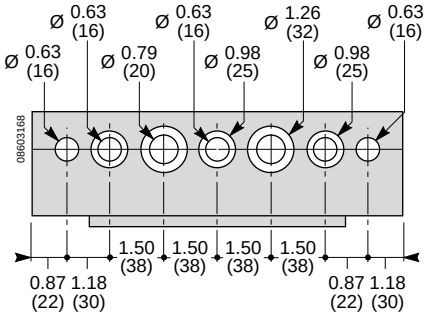
4 Modules
Top View



6 Modules
Top View



8 Modules
Top View



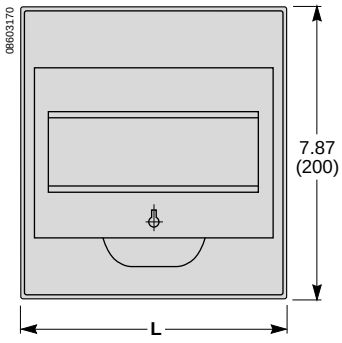
12 Modules
Top View

Dimensions: in. (mm)

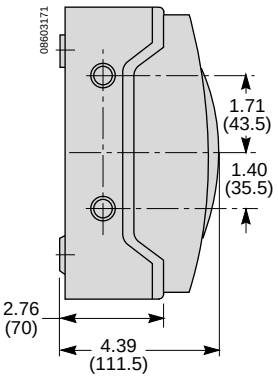
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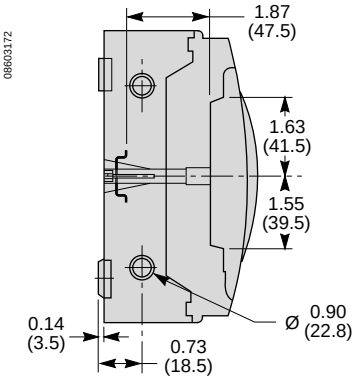
PRAGMA™ Weatherproof Type Enclosures



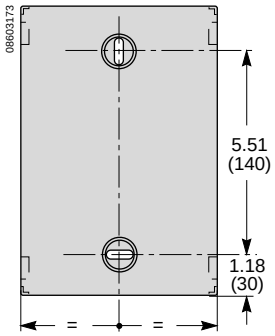
Front View



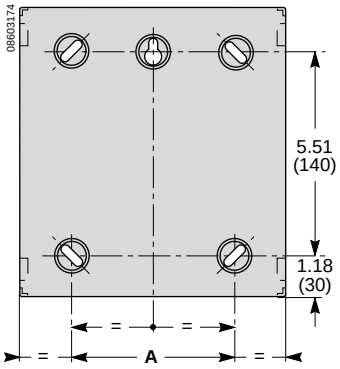
Side View



Rail Position

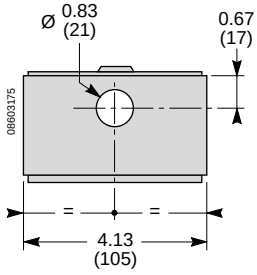


Wall Mounting
(3, 4 and 6 Modules)

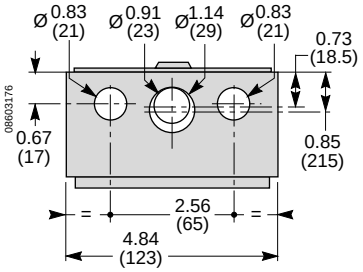


Wall Mounting
(8 and 12 Modules)

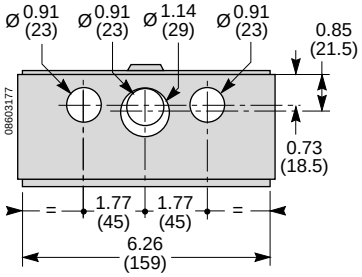
Number of Modules	A	L
3	—	105
4	—	123
6	—	159
8	88	195
12	160	267



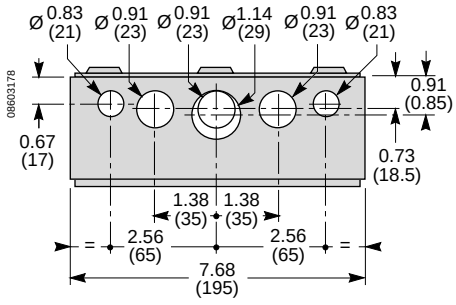
Top View
(3 Modules)



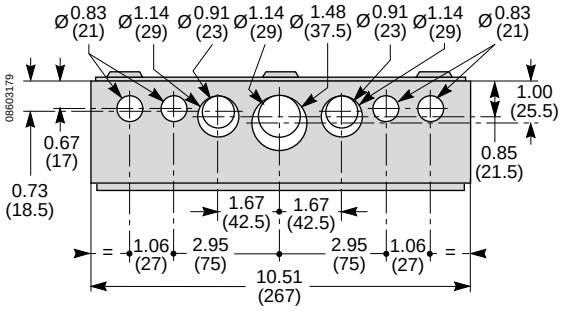
Top View
(4 Modules)



Top View
(6 Modules)



Top View
(8 Modules)



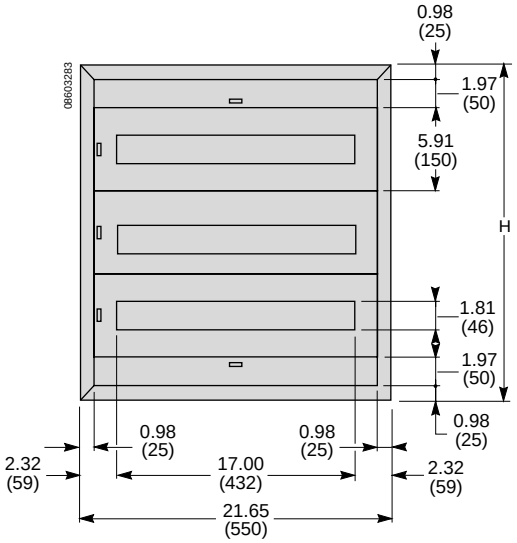
Top View
(12 Modules)

Dimensions: in. (mm)

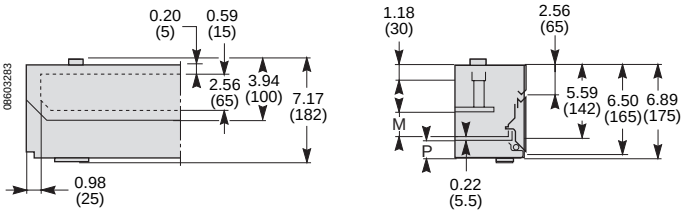
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PRAGMA F DIN-type Enclosures

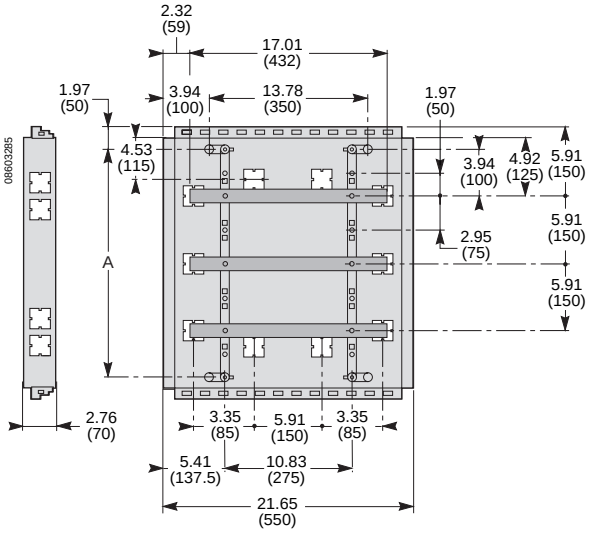


Surface Mounting Enclosure

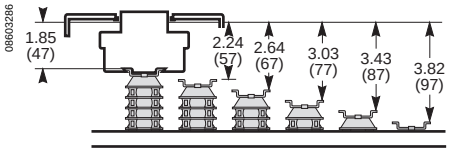


Dimension		Inch/mm
M	Min.	1.85/47
	Max.	3.82/97
P	Plain door	1.10/28
	Transparent door	1.30/33

Surface Mounting Enclosure with Door



Chassis



Adjustment of Chassis Depth

Number of Rows	H	A
1	11.8/300	7.9/200
2	17.7/450	13.8/350
3	23.6/600	19.7/500
4	29.5/750	25.6/650
5	35.4/900	31.5/800
6	41.3/1050	37.4/950

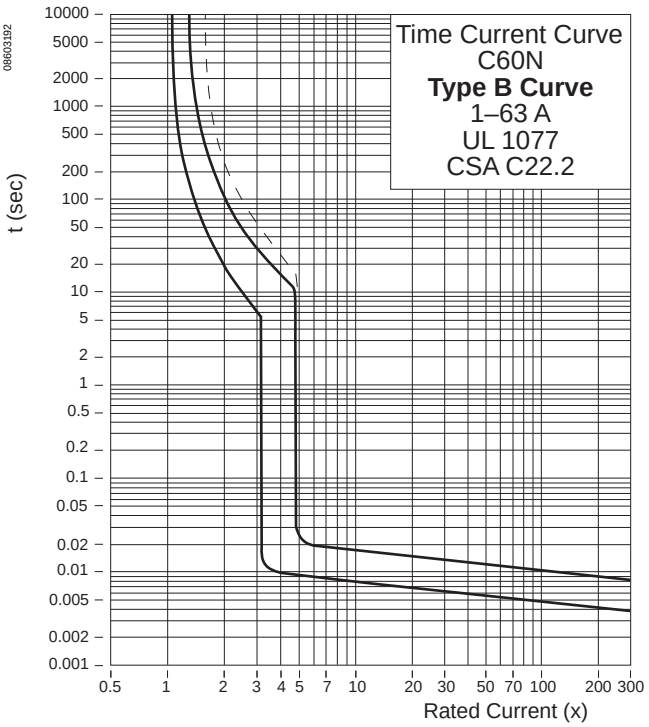
Dimensions: in. (mm)

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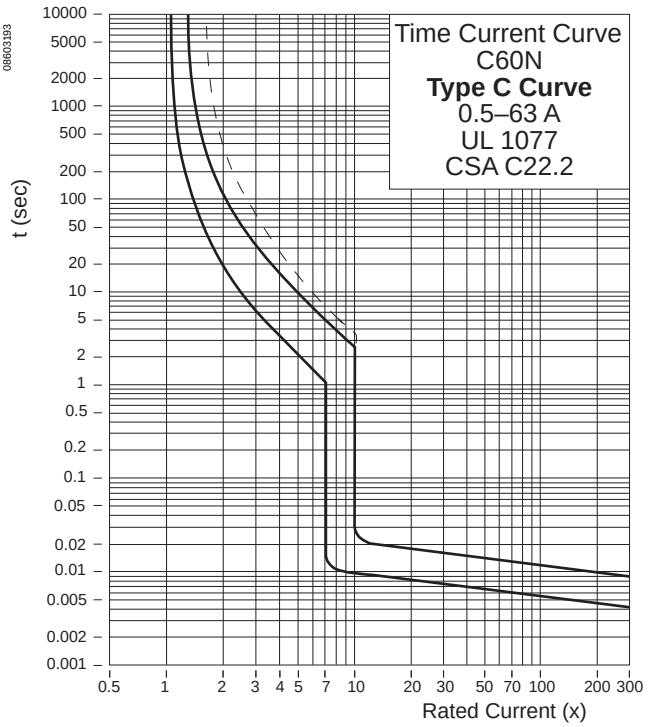
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Time/Current Curves

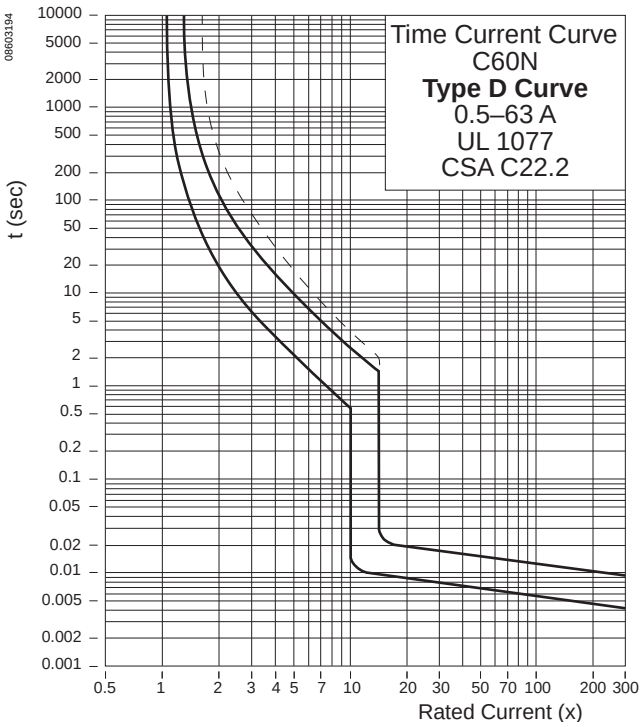
C60N—UL Recognized—B Curve (1–63 A)



C60N—UL Recognized—C Curve (0.5–63 A)



C60N—UL Recognized—D Curve (0.5–63 A)



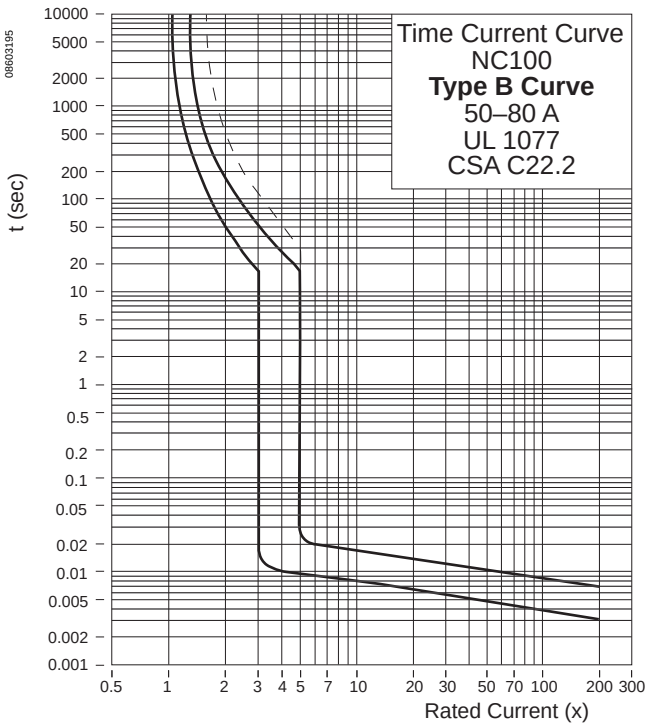
NOTE: Dotted line is the tripping limit of a single pole of a multi-pole device.

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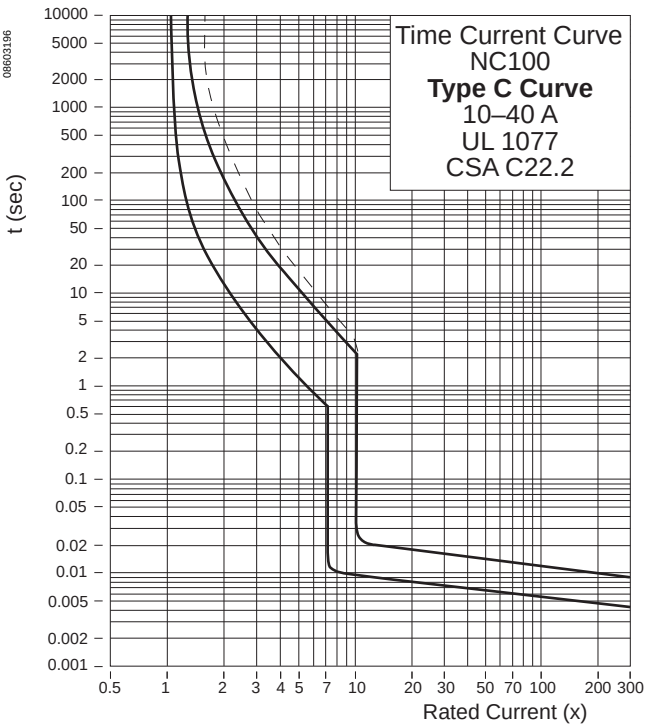
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Time/Current Curves

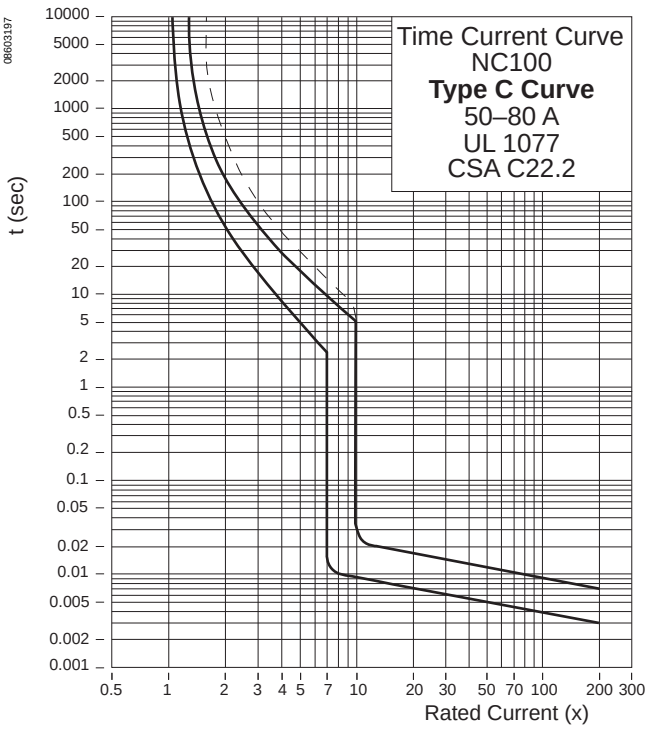
NC100—UL Recognized—B Curve (50–80 A)



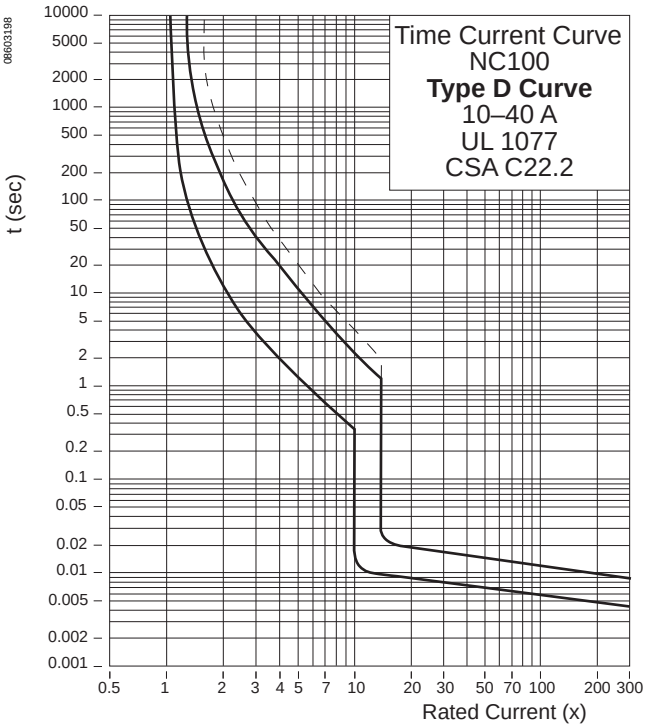
NC100—UL Recognized—C Curve (10–40 A)



NC100—UL Recognized—C Curve (50–80 A)



NC100—UL Recognized—D Curve (10–40 A)



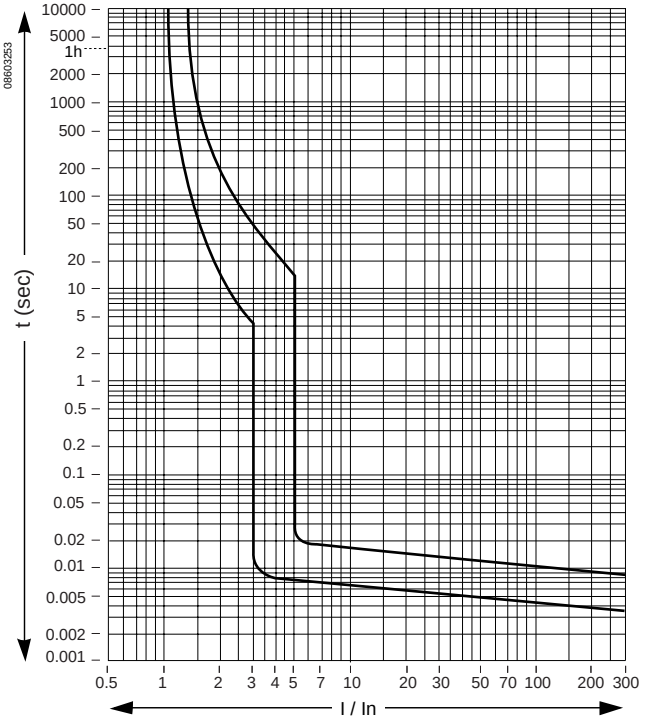
NOTE: Dotted line is the tripping limit of a single pole of a multi-pole device.

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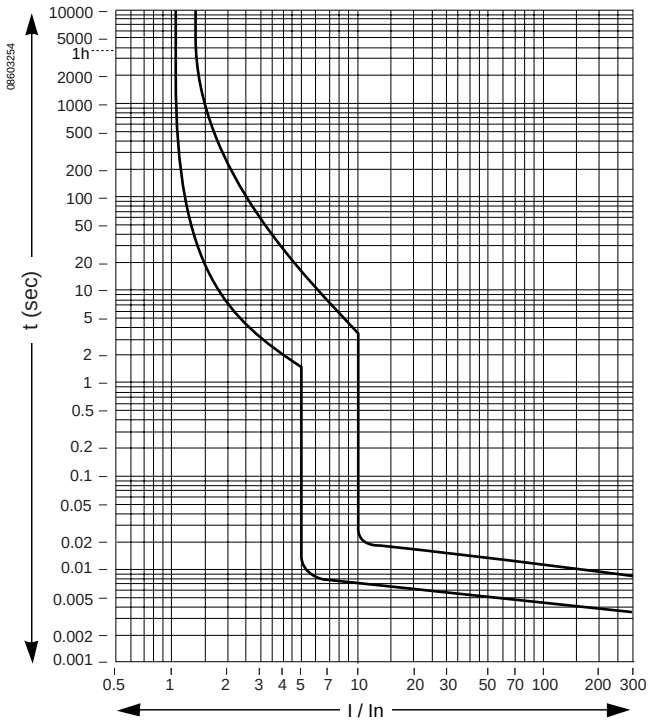
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Time/Current Curves

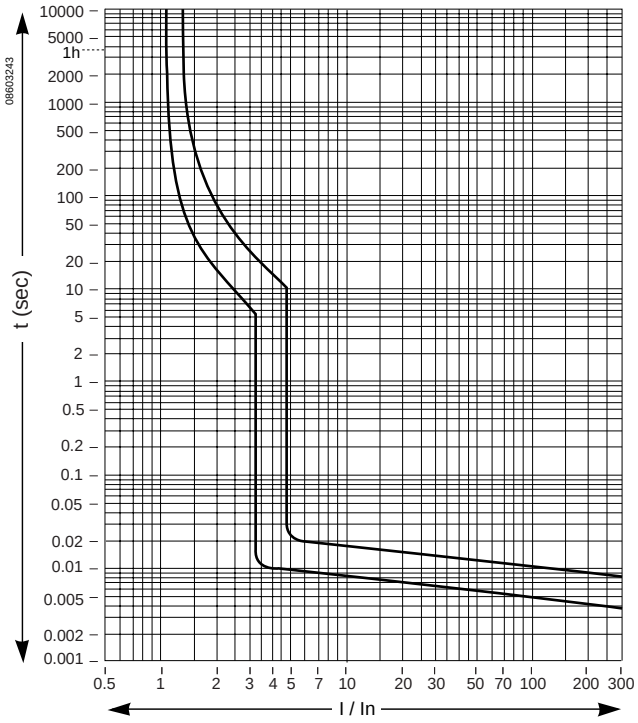
DP-N—IEC Rated—B Curve



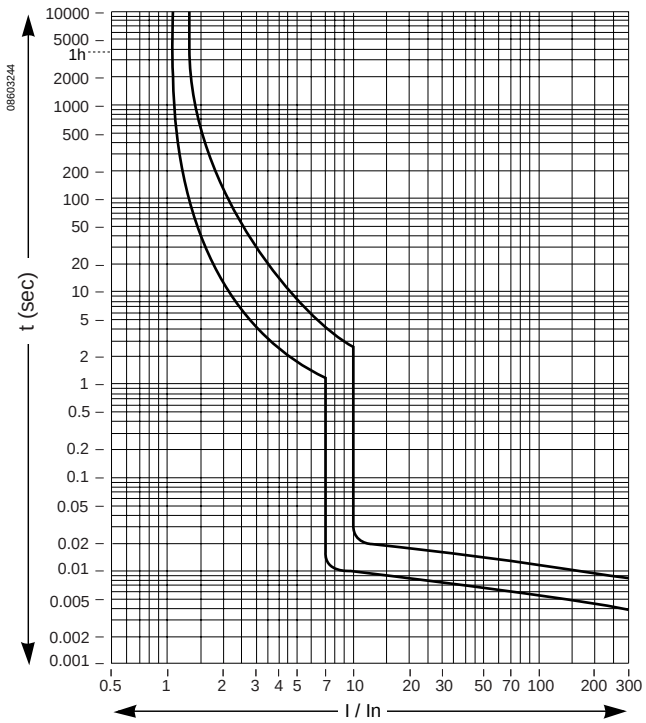
DP-N—IEC Rated—C Curve



C60N/H/L—IEC Rated—B Curve



C60N/H/L—IEC Rated—C Curve



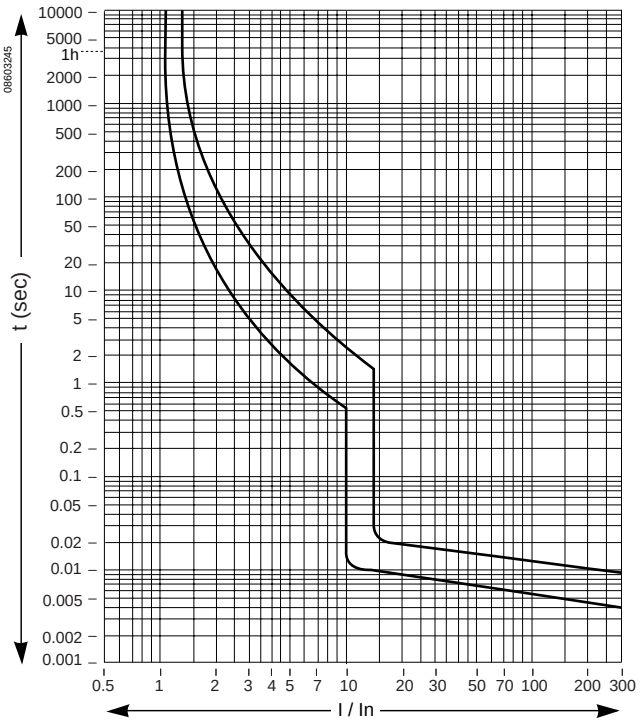
NOTE: The above time/current curves show the cold thermal tripping limits when the poles are charged and show the electromagnetic tripping limits with two charged poles.

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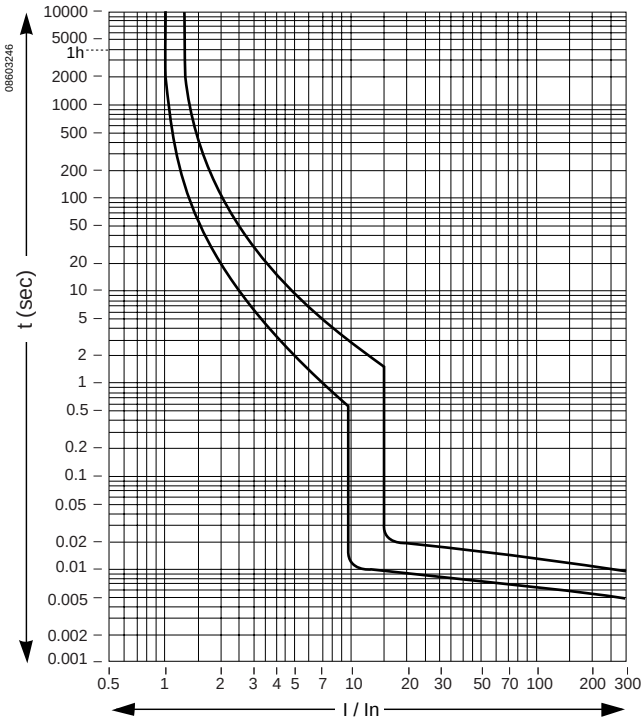
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Time/Current Curves

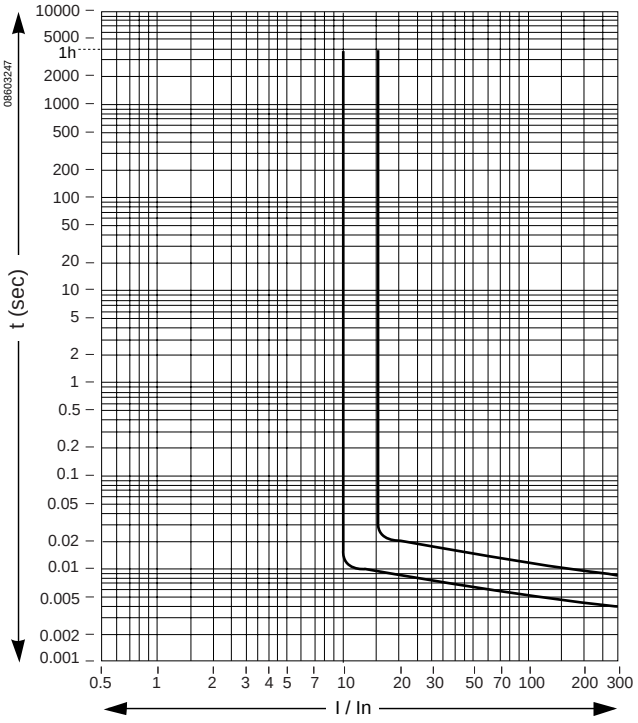
C60N/H—IEC Rated—D Curve



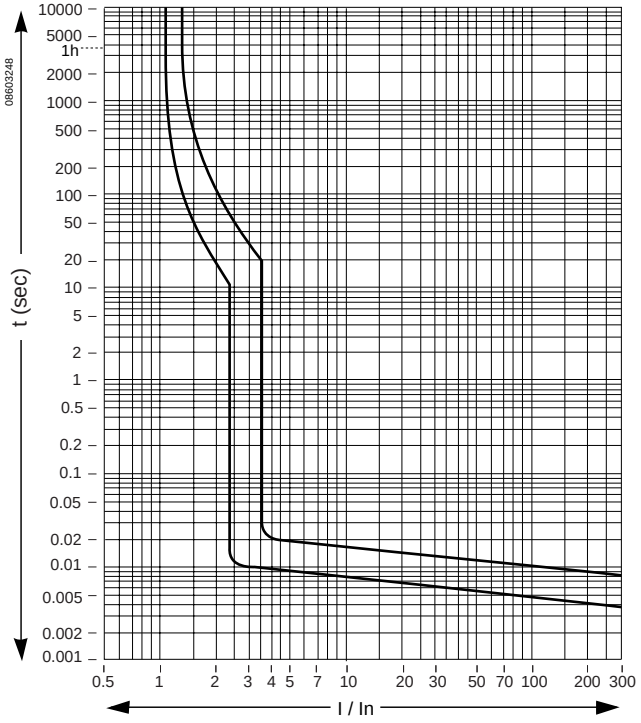
C60L—IEC Rated—K Curve



C60L-MA—IEC Rated—MA Curve



C60L—IEC Rated—Z Curve



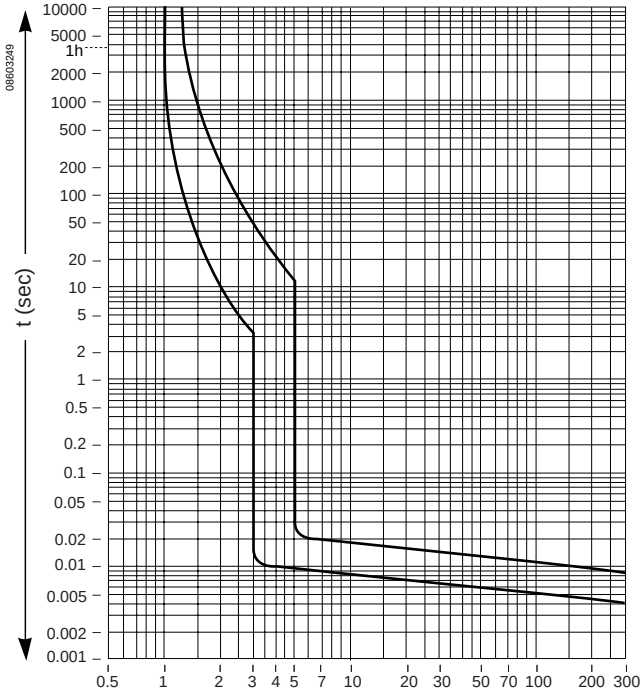
NOTE: The above time/current curves show the cold thermal tripping limits when the poles are charged and show the electromagnetic tripping limits with two charged poles.

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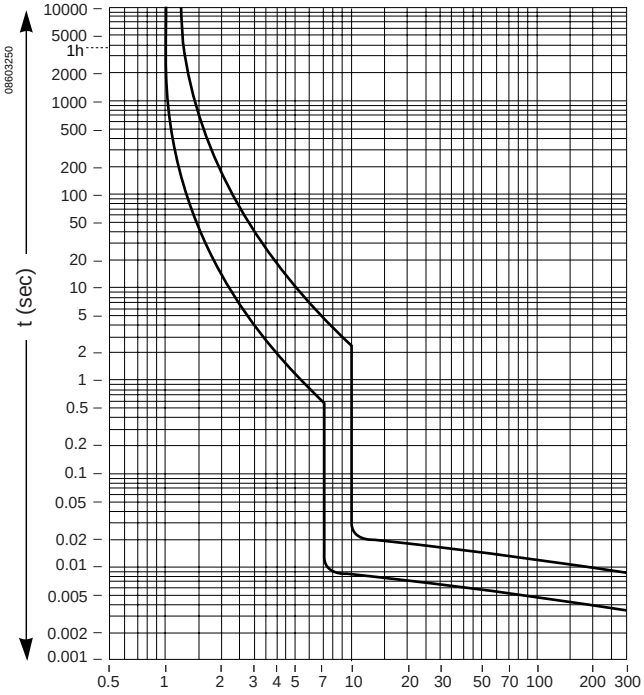
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Time/Current Curves

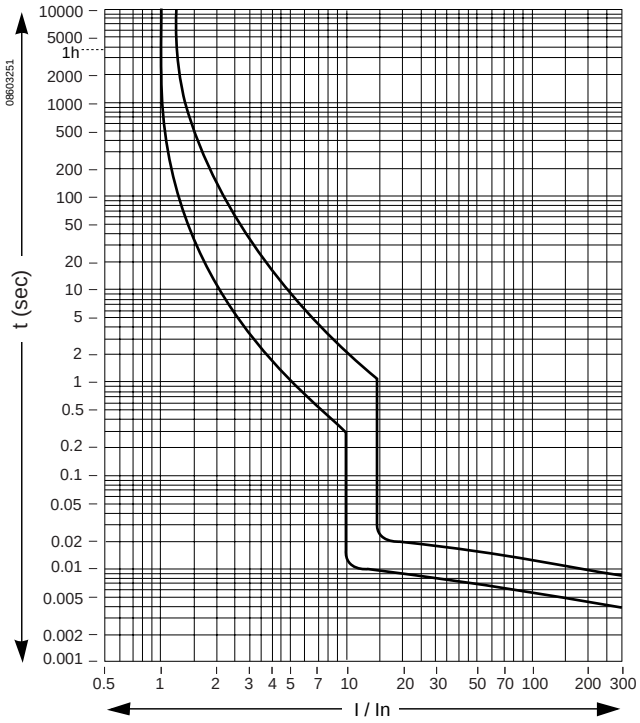
NC100—IEC Rated—B Curve



NC100—IEC Rated—C Curve



NC100—IEC Rated—D Curve



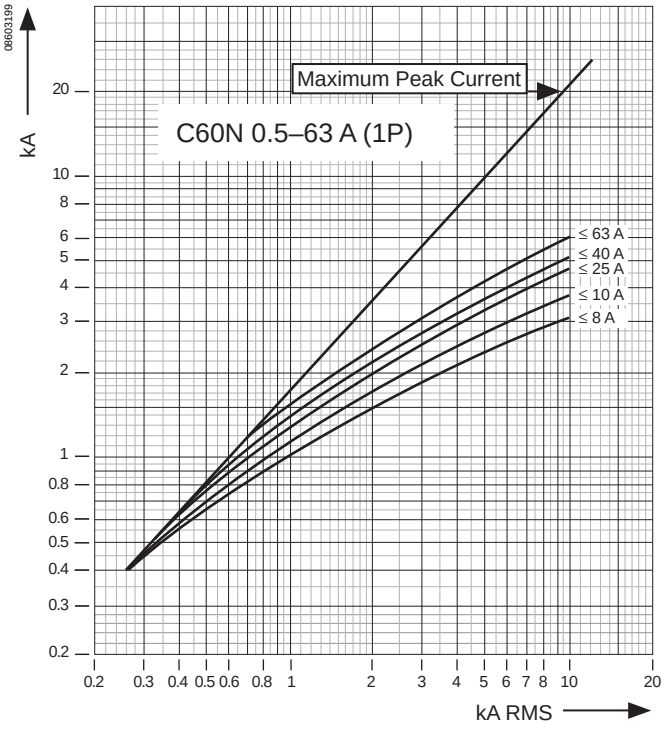
NOTE: The above time/current curves show the cold thermal tripping limits when the poles are charged and show the electromagnetic tripping limits with two charged poles.

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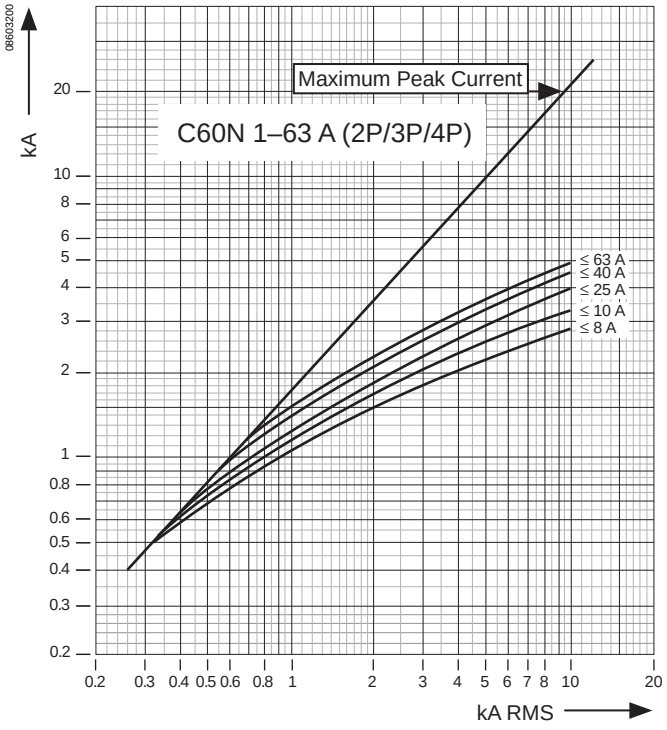
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Max. Let-through Peak Current Curves

C60N 1P—UL Recognized (240 Vac)

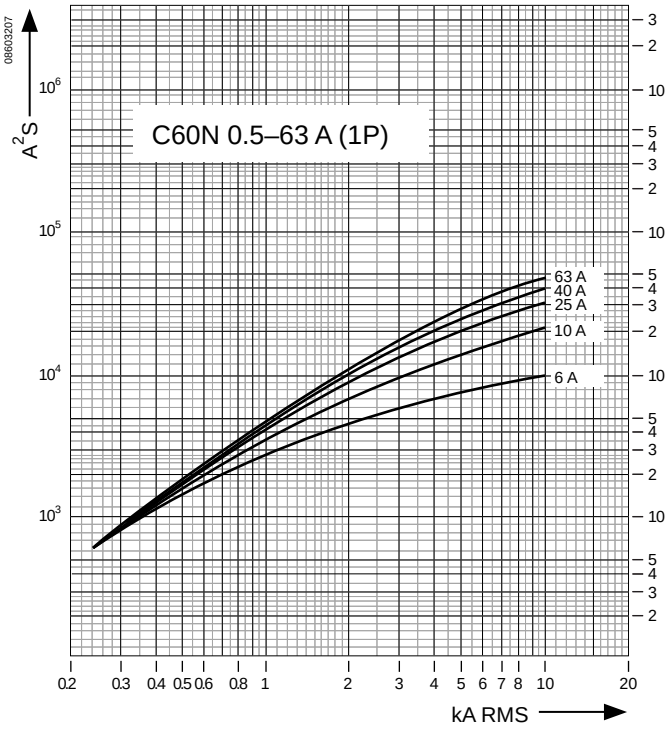


C60N 2P/3P/4P—UL Recognized (240 Vac)

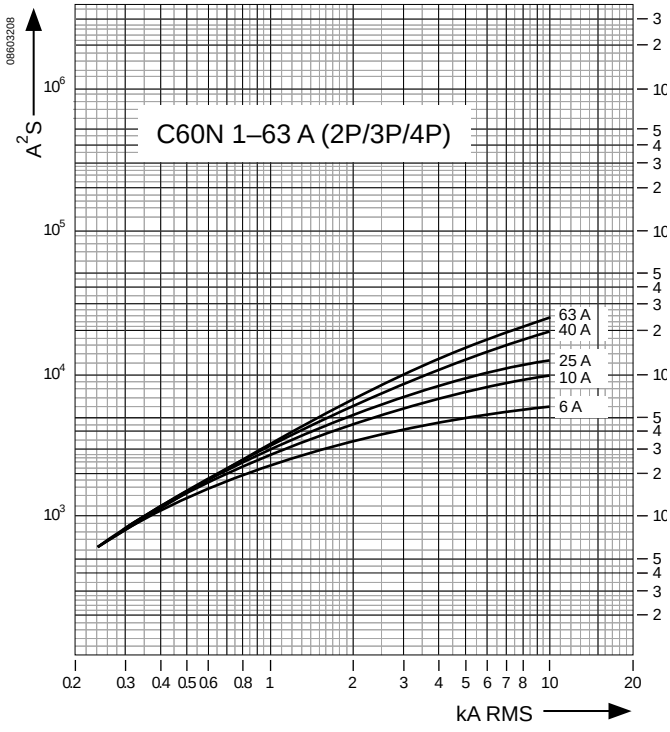


Max. Let-through I^2t Current Curves

C60N 1P—UL Recognized (240 Vac)



C60N 2P/3P/4P—UL Recognized (240 Vac)

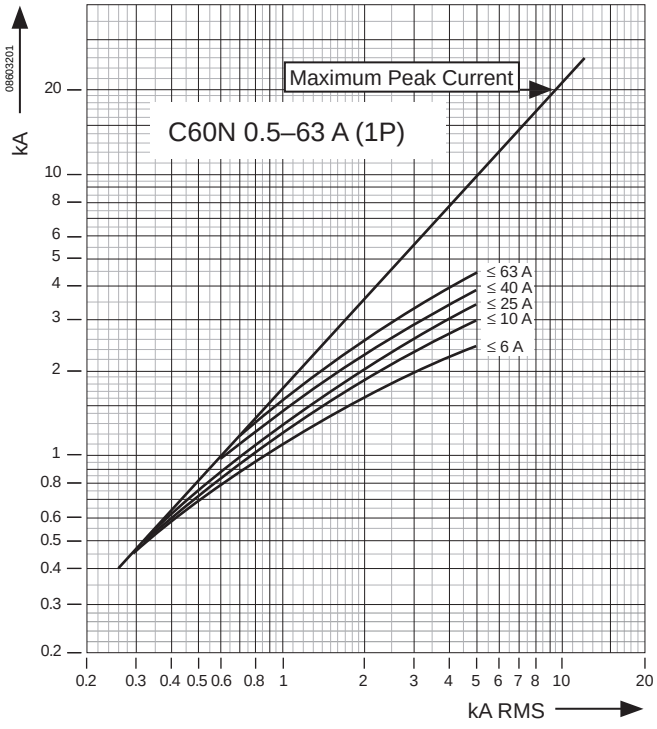


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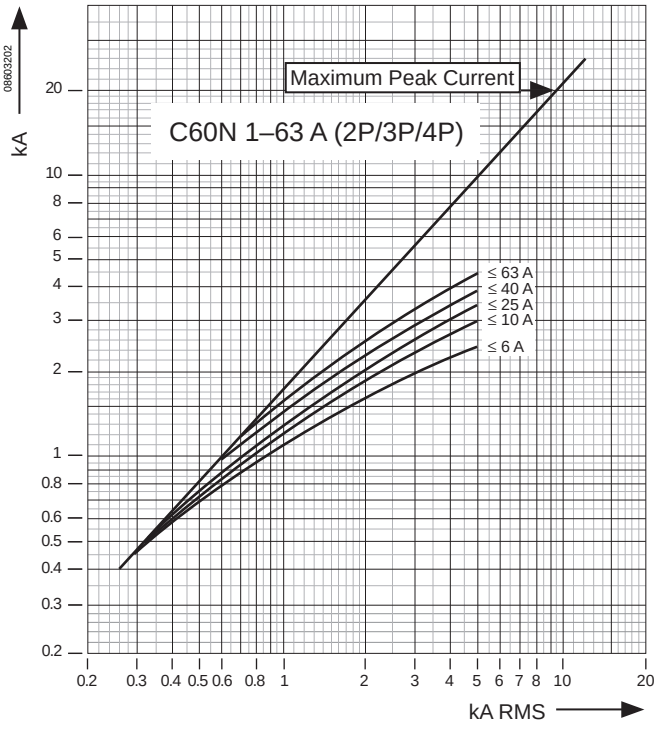
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Max. Let-through Peak Current Curves

C60 1P—UL Recognized (277 Vac)

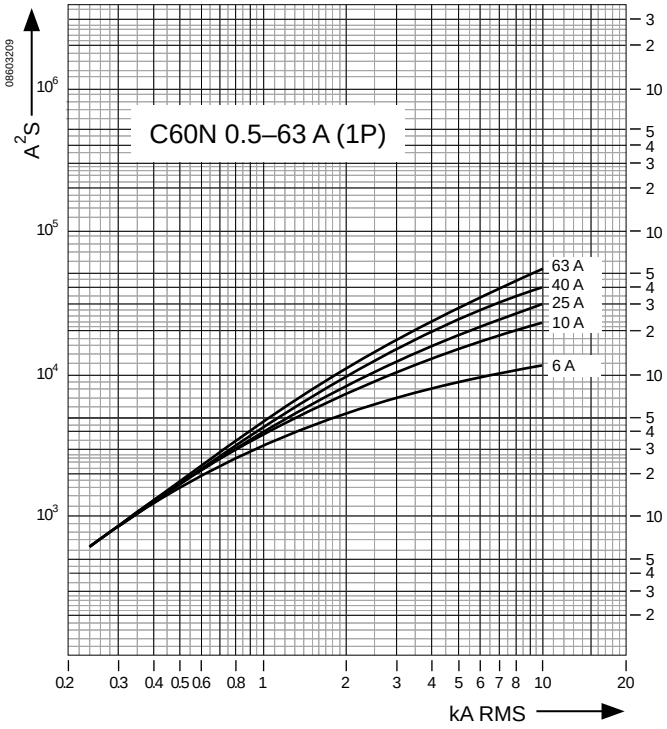


C60 2P/3P/4P—UL Recognized (480Y/277 Vac)

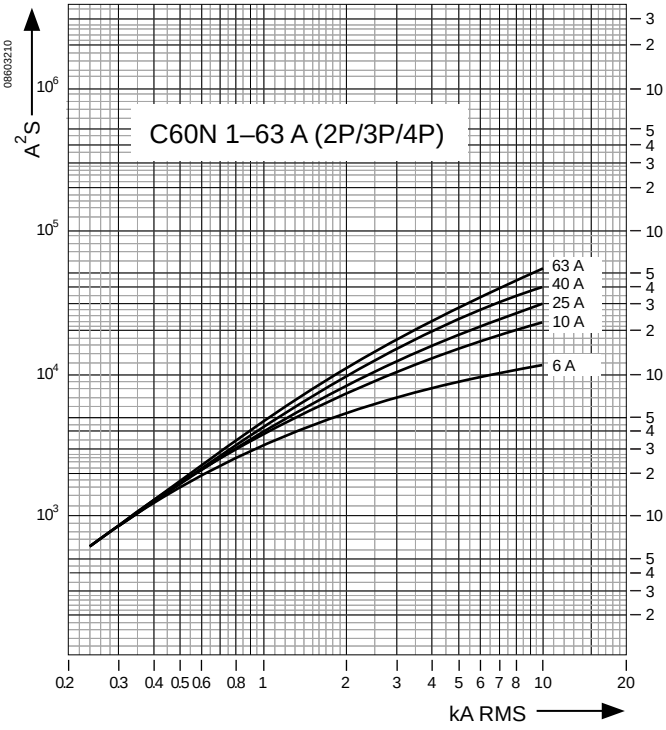


Max. Let-through I^2t Current Curves

C60 1P—UL Recognized (277 Vac)



C60 2P/3P/4P—UL Recognized (480Y/277 Vac)

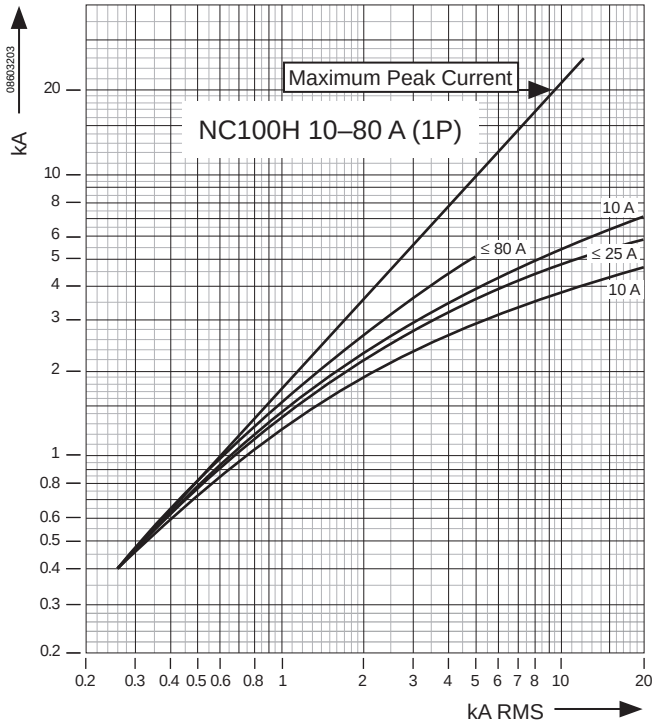


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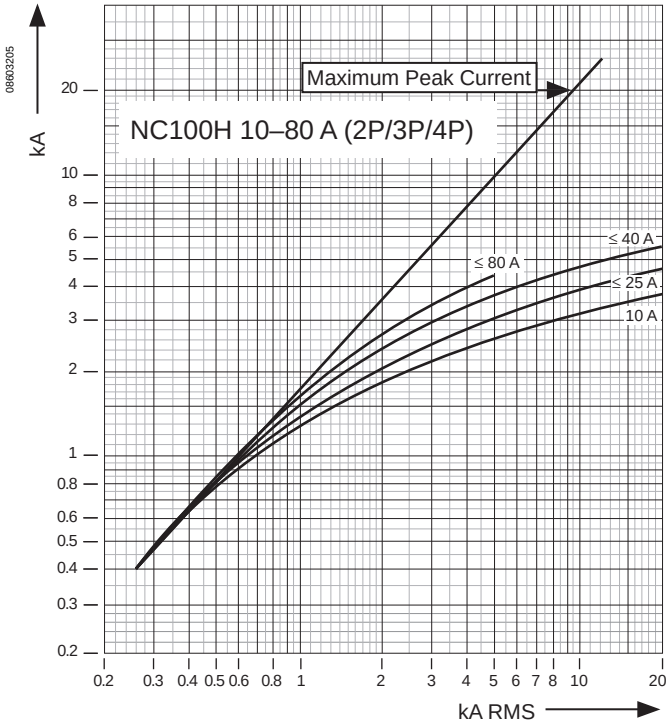
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Max. Let-through Peak Current Curves

NC100H 1P—UL Recognized (240 Vac)

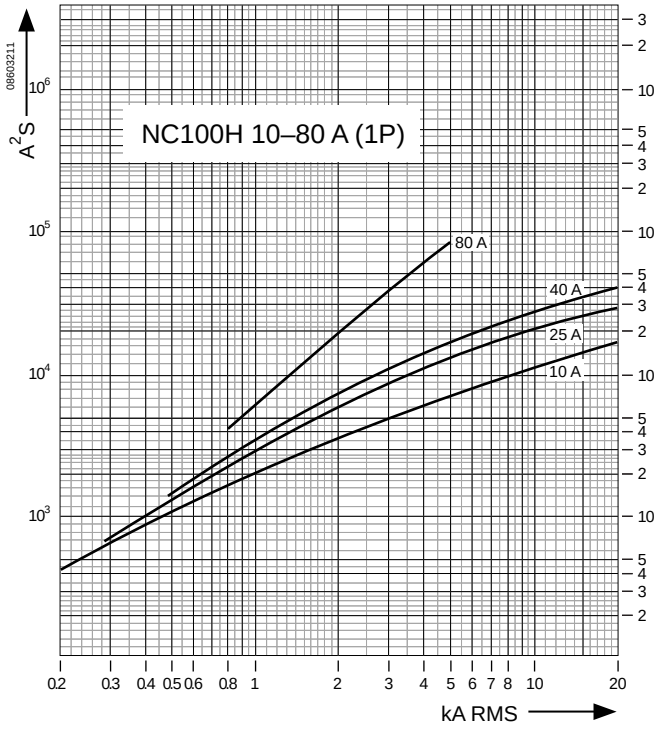


NC100 2P/3P/4P—UL Recognized (240 Vac)

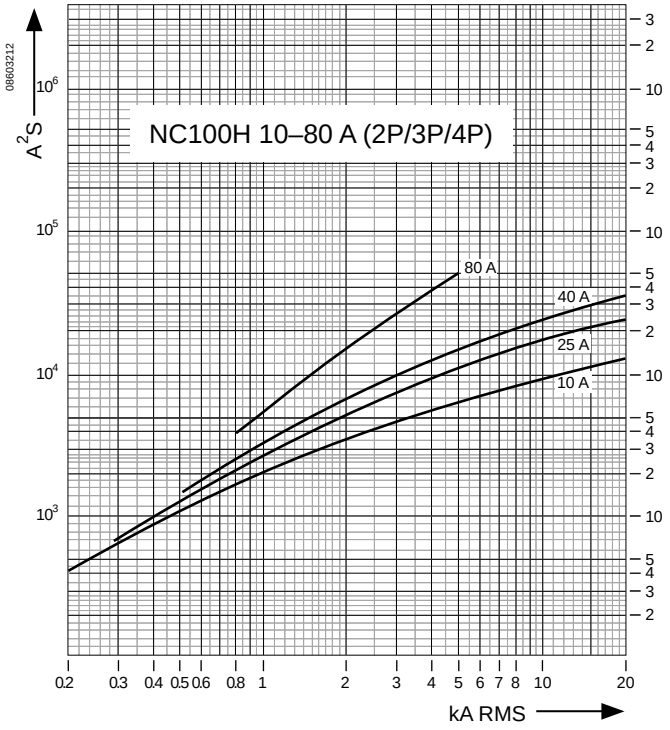


Max. Let-through I^2t Current Curves

NC100 1P—UL Recognized (240 Vac)



NC100 2P/3P/4P—UL Recognized (240 Vac)

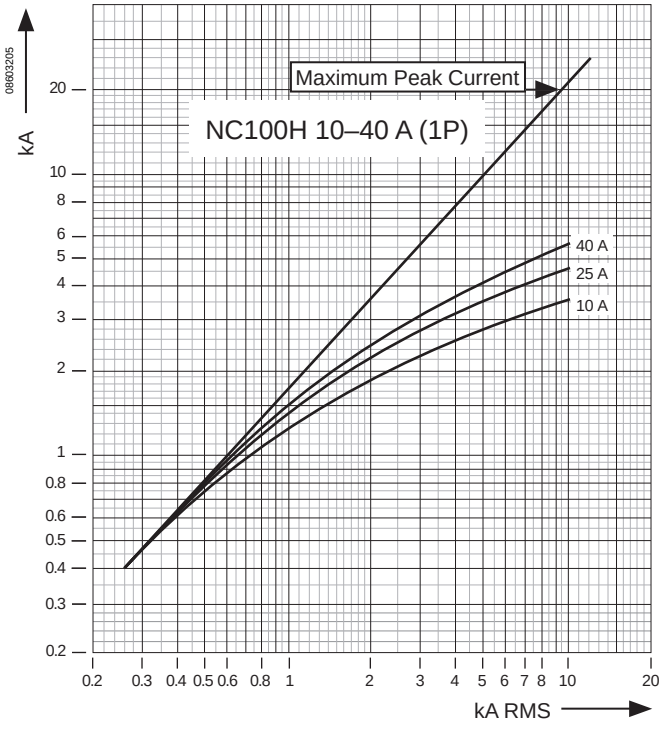


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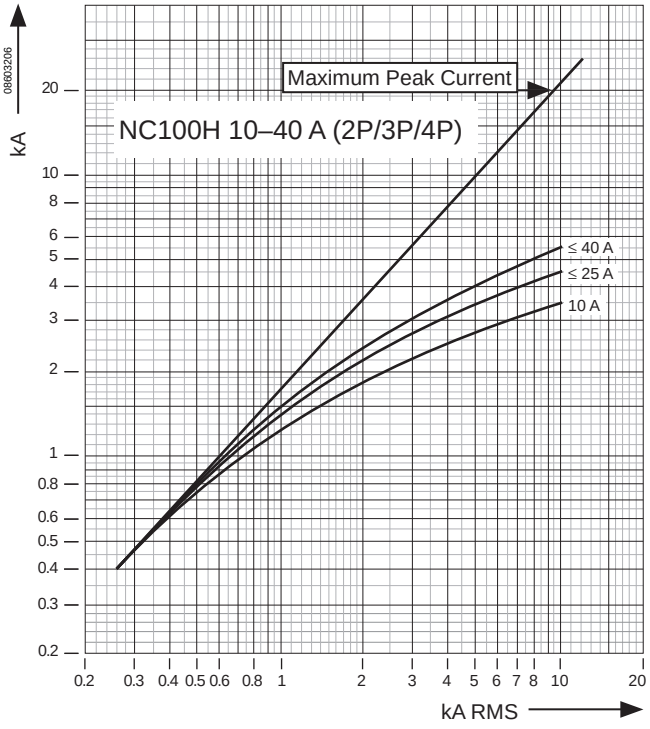
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Max. Let-through Peak Current Curves

NC100H 1P—UL Recognized (277 Vac)

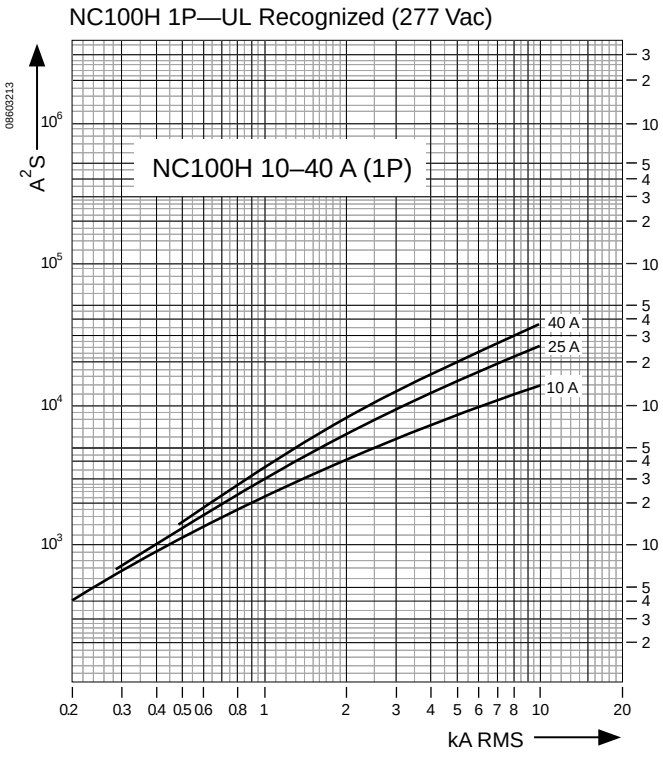


NC100 2P/3P/4P—UL Recognized (480Y/277 Vac)

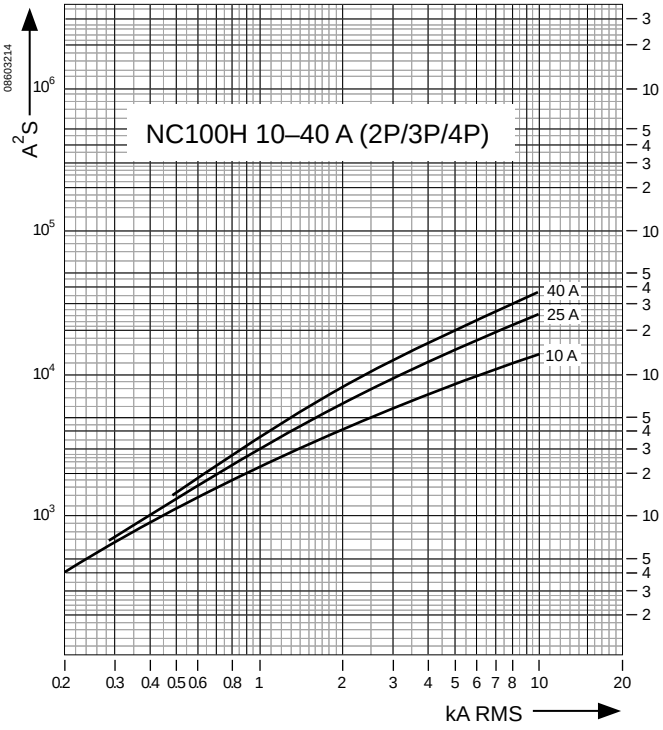


Max. Let-through I^2t Current Curves

NC100H 1P—UL Recognized (277 Vac)



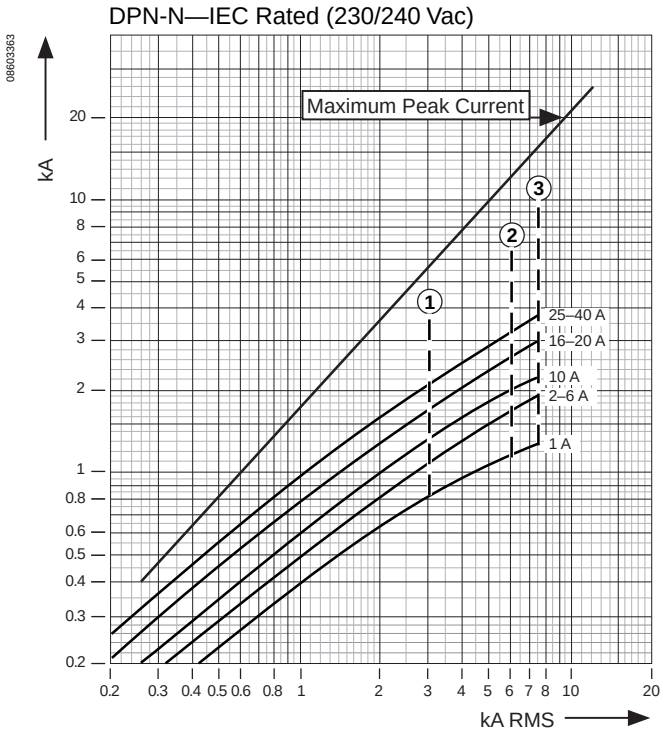
NC100 2P/3P/4P—UL Recognized (480Y/277 Vac)



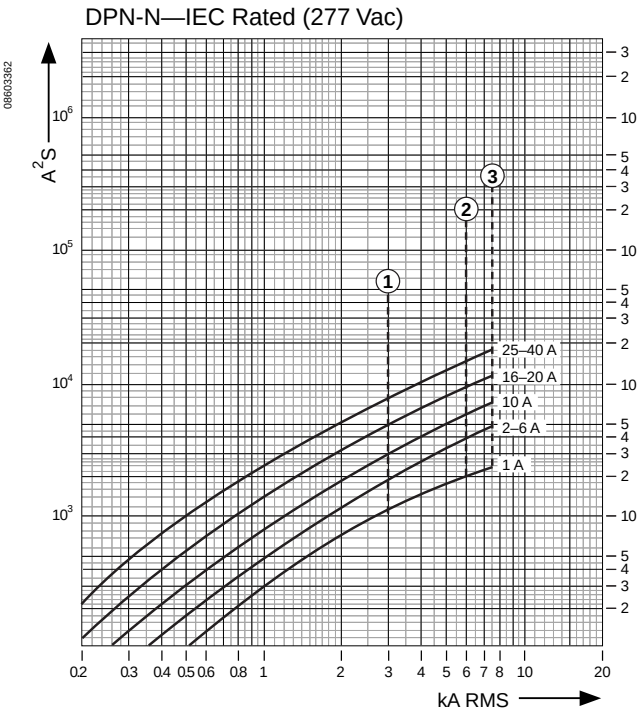
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Max. Let-through Peak Current Curves



Max. Let-through I^2t Current Curves



Key for both let-through peak current curves and I^2t current curves.

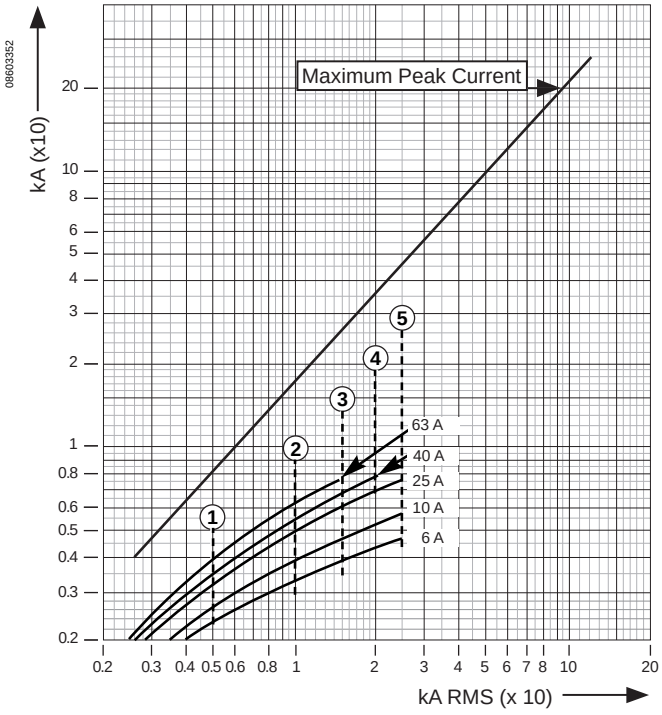
① Vigi
② DPN, DPN Vigi
③ DPN, DPN-N Vigi

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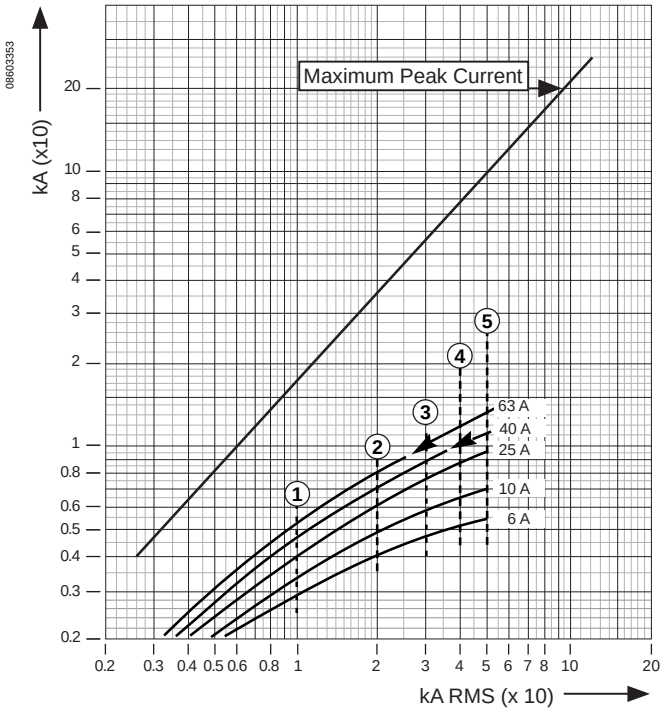
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Max. Let-through Peak Current Curves

C60 1P—IEC Rated (230/240 Vac)

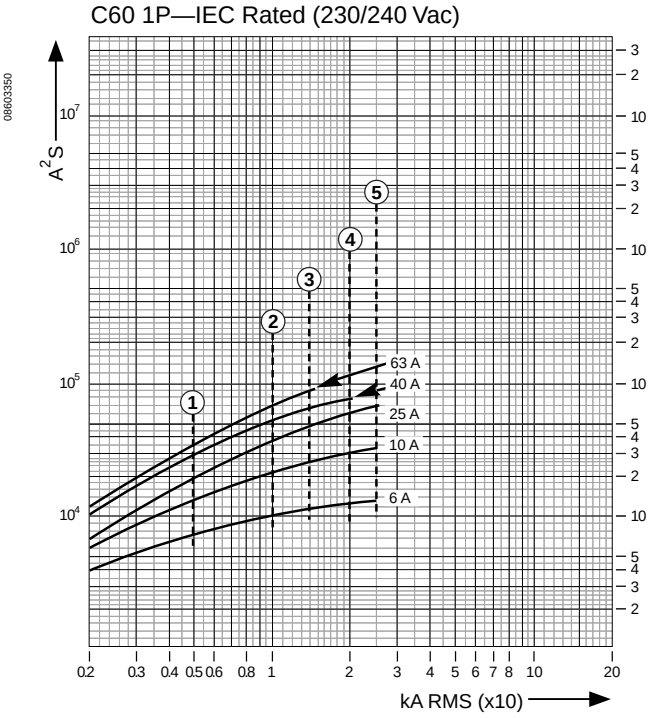


C60 2P/3P/4P—IEC Rated (230/240 Vac)

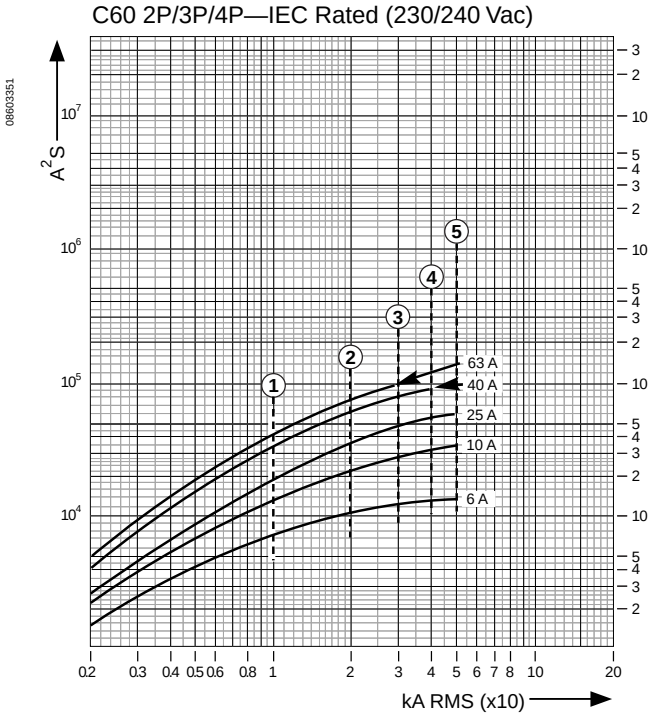


Max. Let-through I^2t Current Curves

C60 1P—IEC Rated (230/240 Vac)



C60 2P/3P/4P—IEC Rated (230/240 Vac)



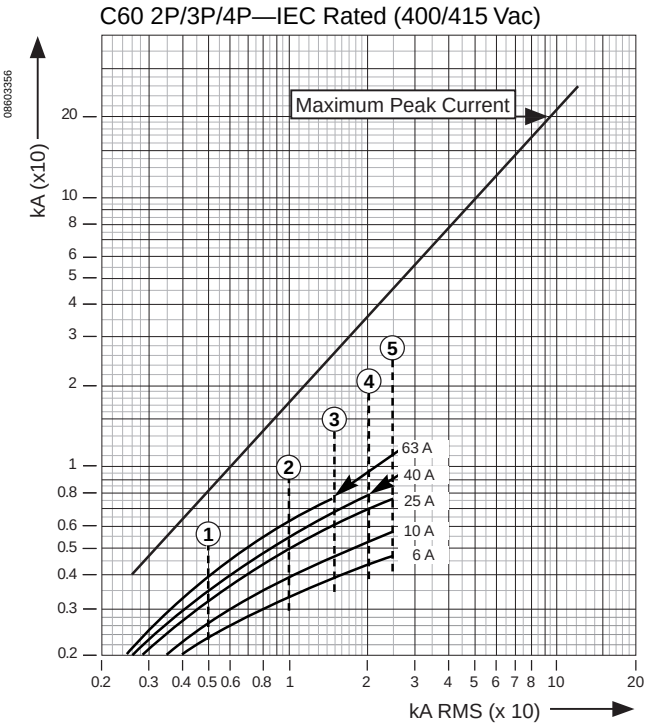
Key for both let-through peak current curves and I^2t current curves.

① C60
② C60N
③ C60H, C60L 50–60 A
④ C60L 32–40 A, C60L-MA 40 A
⑤ C60L ≤ 25 A, C60L-MA ≤ 25 A

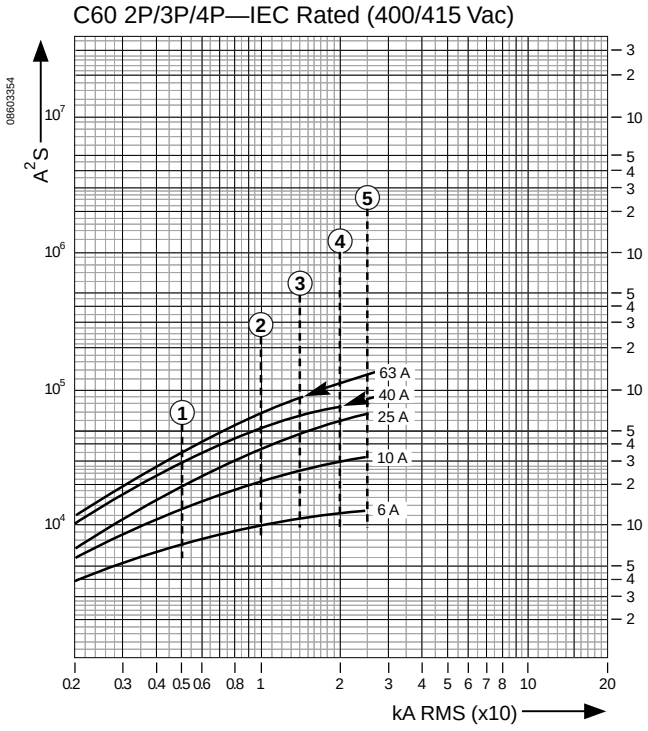
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Max. Let-through Peak Current Curves



Max. Let-through I^2t Current Curves



Key for both let-through peak current curves and I^2t current curves.

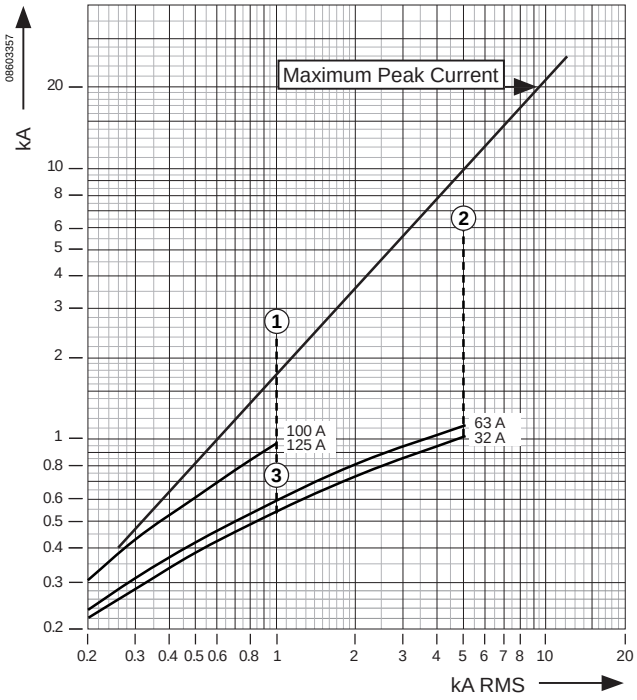
① C60
② C60N
③ C60H, C60L 50–60 A
④ C60L 32–40 A, C60L-MA 40 A
⑤ C60L ≤ 25 A, C60L-MA ≤ 25 A

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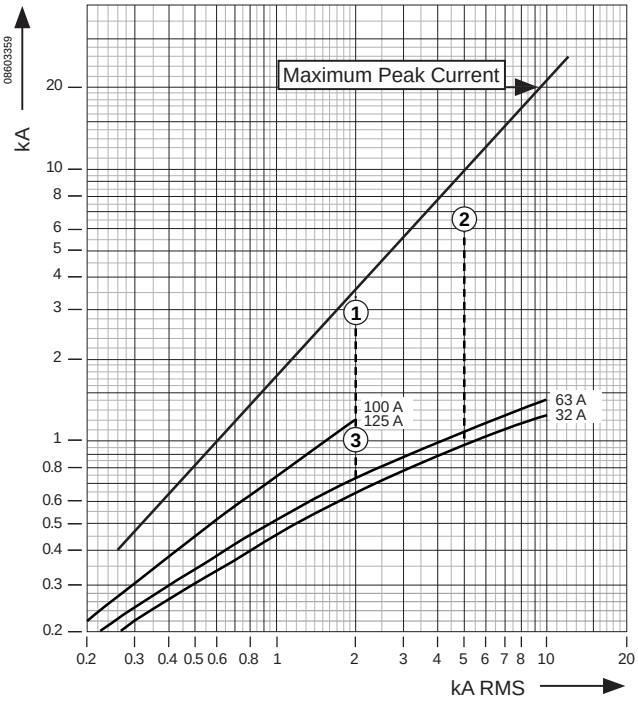
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Max. Let-through Peak Current Curves

NC100/125 1P—IEC Rated (230/240 Vac)

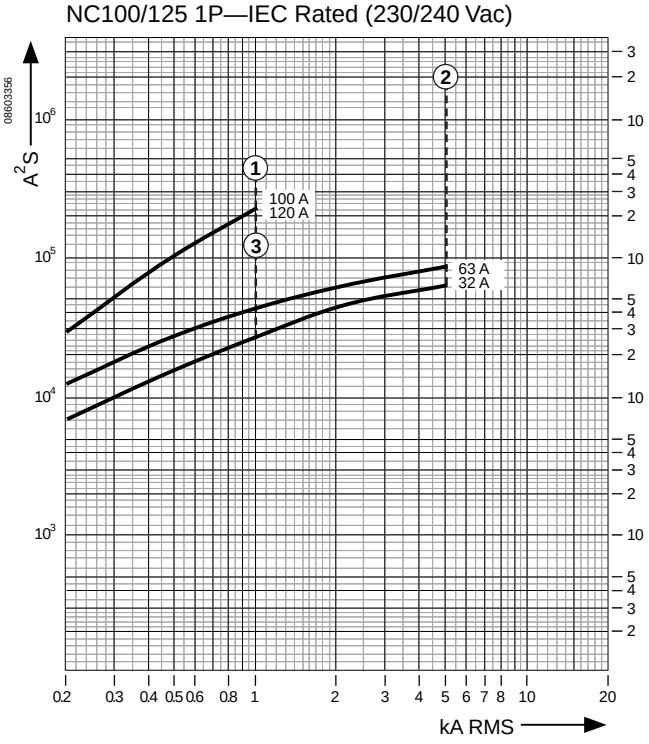


NC100/125 2P/3P/4P—IEC Rated (230/240 Vac)

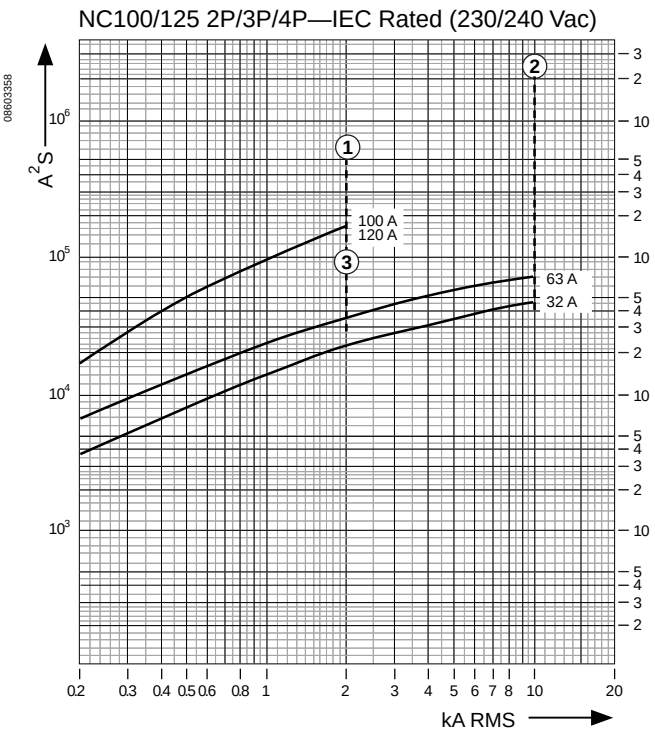


Max. Let-through I^2t Current Curves

NC100/125 1P—IEC Rated (230/240 Vac)



NC100/125 2P/3P/4P—IEC Rated (230/240 Vac)



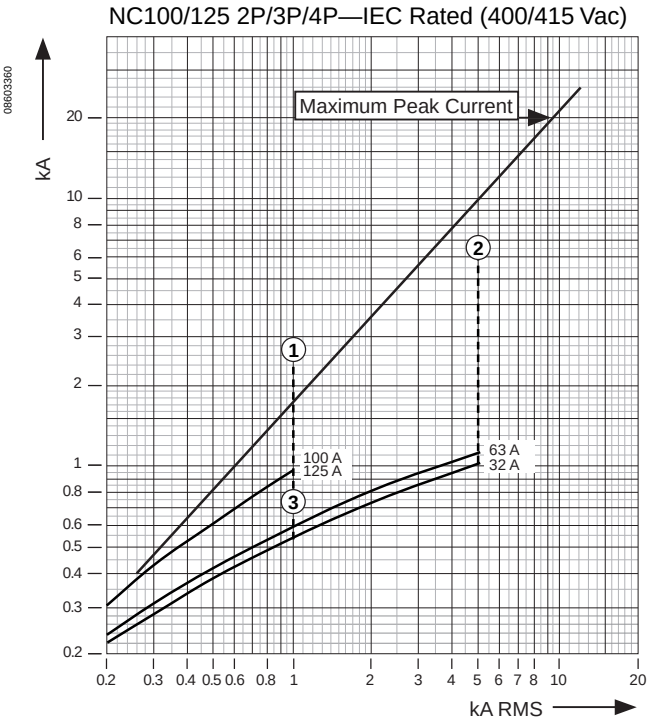
Key for both let-through peak current curves and I^2t current curves.

① NC100H
② NC100LH, NC100L-MA
③ NC125H

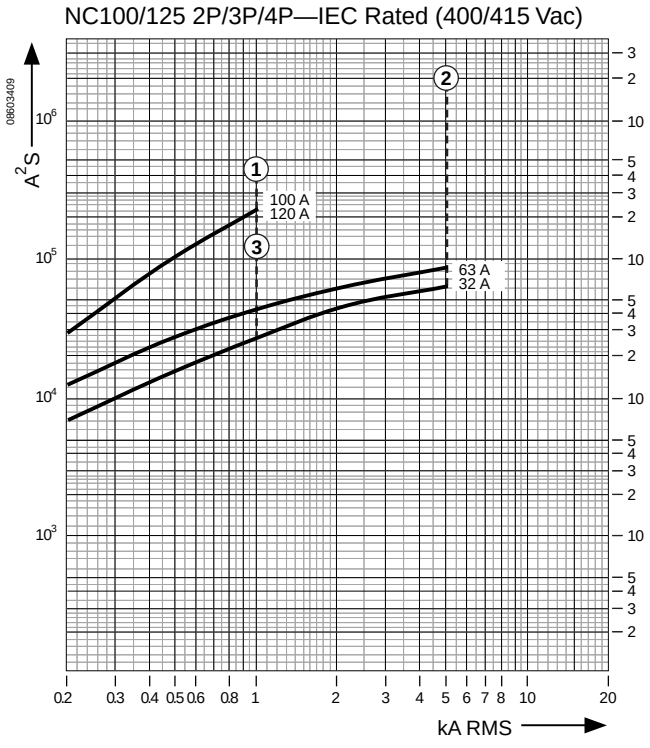
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Max. Let-through Peak Current Curves



Max. Let-through I^2t Current Curves



Key for both let-through peak current curves and I^2t current curves.

① NC100H
② NC100LH, NC100L-MA
③ NC125H

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REFERENCE TO IEC 529 STANDARDS:

Degree of Protection (IP)

The IEC 529 Standard publication or the European EN60.529 Standard define the IP degree of protection characterizing the ability of a device to withstand the two external influences below:

- Ingress of solid bodies and protection of people
- Ingress of water

The IP contains two digits, one for each of these external influences, and is assigned to the device after a series of tests defined by the NF EN 60.529 Standard. The IP degree of protection must always be read and understood digit by digit and not globally. The two IP digits may contain an optional letter which indicates the enclosure's ability to protect people against access to live parts.

Protection Against Mechanical Shocks (IK)

Standard EN 50.102 defines an IK code characterizing the ability of a device to withstand mechanical shocks. The IK code, replaces the third digit of the old IP.

General Comments

When mounted outdoors, the IP ≥ 54 enclosures must be:

- Equipped with a protectable top, or
- Installed in a shelter

The degrees of protection given in this catalog apply for enclosures as described here. However, the initial degree of protection can only be maintained if the device is properly assembled and installed.

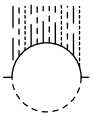
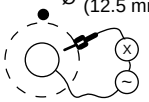
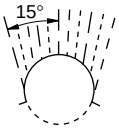
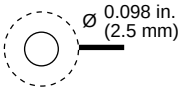
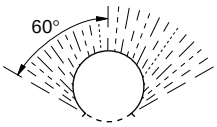
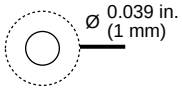
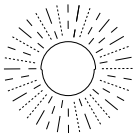
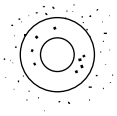
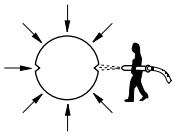
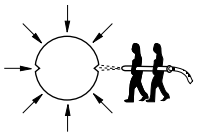
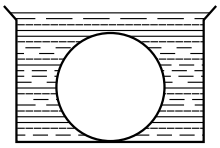
Class 2

The term "double insulation" is also used. This consists of backing up the main insulation of an electrical device by an additional insulation in order to protect people against direct contact.

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Degree of Protection

First Digit Solid Body Protection		Second Digit Liquid Protection		Third Digit Mechanical Protection		
IP	Tests	**IP**	Tests	**IP**	Tests	**IK**
0	No protection	**0**	No protection	**0**	No protection	**00**
1 	Protected against solid bodies larger than 1.97 in. (50 mm), e.g., accidental hand contact	**1** 	Protected against vertically falling water droplets (condensation)	**1**	Impact energy 0.225 joules	**02**
2 	Protected against solid bodies larger than 0.47 in. (12 mm), e.g., fingers	**2** 	Protected against falling water droplets up to 15° from vertical	**3**	Impact energy 500 joules	**04**
3 	Protected against solid bodies larger than 0.098 in. (2.5 mm), e.g., tools, wires	**3** 	Protected against rainwater up to 60° from vertical	**5**	Impact energy 2.00 joules	**07**
4 	Protected against solid bodies larger than 0.039 in. (1 mm), e.g., fine tools, small wires	**4** 	Protected against water spray from all directions	**7**	Impact energy 6.00 joules	**08**
5 	Protected against dust (no harmful deposit)	**5** 	Protected against water splashes from all directions by jet pipes	**9**	Impact energy 20.00 joules	**10**
6 	Completely protected against dust	**6** 	Protected against water splashes/waves (of the heavy sea kind)			
		7 	Protected against immersion effects			

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Vibrations—as per IEC 68.2.6 Standard*

Curve B	Sequence S3 (0.14 oz./4 g)	5–13 Hz: 13–300 Hz:	± (0.24 in. /6 mm) (0.14 oz/4 g)
Curve C and D	Sequence S6 (0.25 oz./7 g)	5–58 Hz: 58–300 Hz:	± (0.02 in. /0.5 mm) (0.25 oz/7 g)

* Results depend on magnetic trip level. Five frequency sweeps per axis.

Physical Shocks—as per IEC 68.2.27 Standard

- 1.06 oz./30 g.
- 18 ms.
- 3 shocks per axis.

Protection of 400 Hz Circuits

The C60 and NC100 miniature circuit breakers are designed to be applied on 50/60 Hz systems and can be rerated for use on 400 Hz systems.

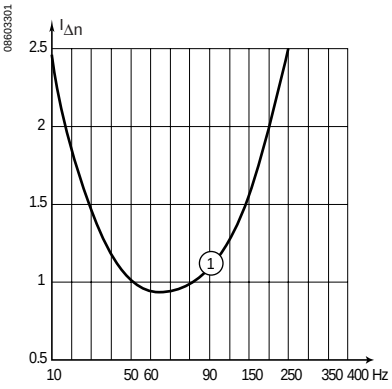
- Thermal: No variation.
- Magnetic increase in thresholds multiplier:
  - DPN-N: 1.50
  - C60N: 1.48
  - NC100H: 1.40

Vigi ground-fault modules and residual current circuit breakers and switches can also be used on 400 Hz systems. Note that the mA threshold varies according to system frequency.

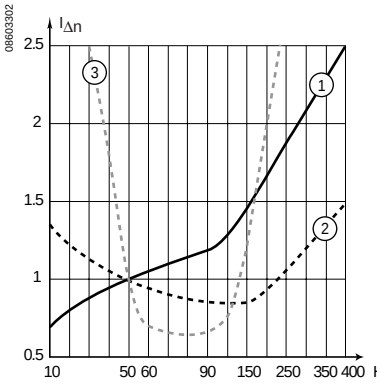
Type	Poles	Interrupting Ratings (Vac)		
		240	277	480Y/277
C60N (0.5–63 A)	1P	4,000	3,000	—
	2P/3P/4P	4,000	—	3,000
NC100H (50–80 A)	1P	3,000	—	—
	2P/3P/4P	3,000	—	—
NC100H (10–40 A)	1P	5,000	4,000	—
	2P/3P/4	5,000	—	4,000

Class	Rating (A)	Curve No. Sensitivity (mA)			
		10	30	100	300
DPN-N Residual Current Circuit Breakers					
AC	≤ 25	①	①	—	①
C60 Vigi Ground-fault Module					
110/220 V, 50 Hz Vigi C60					
AC	≤ 25	②	①	①	—
	≤ 63	—	②	①	—
2P/3P/4P 220/415 V, 50 Hz Vigi C60					
AC	≤ 25	②	①	①	—
	≤ 63	—	②	①	—
AC Ⓢ		—	③	②	②
NC100 Vigi Ground-fault Module					
AC	≤ 100	—	③	—	①
AC Ⓢ	≤ 100	—	②	②	②
ID Residual Current Switch					
AC	25	②	①	—	①
	25–40	—	①	①	①
	63–80–100	—	②	①	①
AC Ⓢ	63–80–100	—	—	—	②

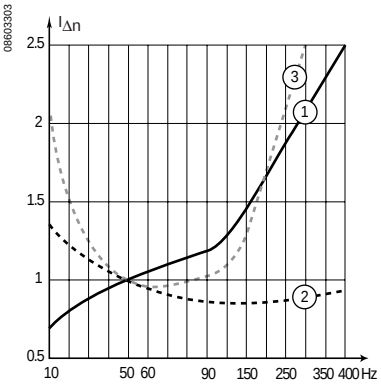
DPN-N Residual Current Circuit Breaker



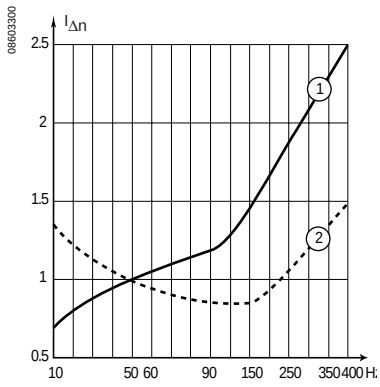
C60 Vigi Ground-fault Module



NC100 Vigi Ground-fault Module



ID Residual Current Switch



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Temperature

- Circuit breakers with uncompensated thermal tripping elements have a tripping-current level that depends on the surrounding temperature. If the circuit breaker is installed in an enclosure, or in a hot location (boiler room, etc.), the current required to trip the circuit breaker on overload will be reduced. When the ambient temperature exceeds the circuit breaker's reference temperature, the supplementary protector or circuit breaker will therefore be "derated." For this reason, circuit breaker manufacturers provide tables which indicate factors to apply at temperatures different from the supplementary protector or circuit breaker reference temperature. It should be noted from typical examples of such tables that an ambient temperature lower temperature than the rated temperature produces an "up-rating" of the supplementary protector or circuit breaker.

NOTE: When several simultaneously operating circuit breakers are mounted side-by-side in a small enclosure, the temperature rise in the enclosure causes a reduction in current rating. Mutual heating generally requires an additional derating coefficient of 0.8.

UL Recognized C60N Supplementary Protectors—Rated Temperature

Ampere Ratings	-22°F / -30°C	-13°F / -25°C	-4°F / -20°C	5°F / -15°C	14°F / -10°C	23°F / -5°C	32°F / 0°C	41°F / 5°C	50°F / 10°C	59°F / 15°C	68°F / 20°C	77°F / 25°C	86°F / 30°C	104°F / 40°C	122°F / 50°C	140°F / 60°C	158°F / 70°C
0.5	1.26	1.24	1.22	1.20	1.17	1.15	1.13	1.10	1.08	1.05	1.03	**1.00**	0.97	0.92	0.85	0.79	0.72
1	1.21	1.19	1.18	1.16	1.14	1.12	1.10	1.08	1.06	1.04	0.02	**1.00**	0.98	0.93	0.89	0.84	0.79
1.2	1.26	1.24	1.22	1.20	1.17	1.15	1.13	1.10	1.08	1.05	1.03	**1.00**	0.97	0.92	0.85	0.79	0.72
1.5	1.32	1.29	1.27	1.24	1.21	1.19	1.16	1.13	1.10	1.07	1.03	**1.00**	0.97	0.89	0.81	0.73	0.63
2	1.21	1.19	1.18	1.16	1.14	1.12	1.10	1.08	1.06	1.04	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	1.11	1.08	1.05	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	1.10	1.07	1.05	1.03	**1.00**	0.97	0.92	0.86	0.80	0.73
5	1.26	1.24	1.22	1.19	1.17	1.15	1.13	1.10	1.08	1.05	1.03	**1.00**	1.97	0.92	0.86	0.79	0.72
6	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.09	1.07	1.05	1.02	**1.00**	0.98	0.93	0.87	0.82	0.76
7	1.29	1.26	1.24	1.22	1.19	1.17	1.14	1.11	1.09	1.06	1.03	**1.00**	0.97	0.91	0.84	0.76	0.68
8	1.29	1.26	1.24	1.22	1.19	1.17	1.14	1.11	1.09	1.06	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	1.11	1.08	1.06	1.03	**1.00**	0.97	0.91	0.85	0.78	0.70
13	1.20	1.18	1.16	1.15	1.13	1.11	1.09	1.08	1.06	1.04	1.02	**1.00**	0.98	0.94	0.90	0.85	0.80
15	1.28	1.25	1.23	1.21	1.18	1.16	1.13	1.11	1.08	1.06	1.03	**1.00**	0.97	0.91	0.85	0.78	0.70
16	1.24	1.22	1.20	1.18	1.16	1.14	1.11	1.09	1.07	1.05	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	1.09	1.07	1.05	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	1.09	1.07	1.05	1.02	**1.00**	0.98	0.93	0.87	0.81	0.75
30	1.30	1.27	1.25	1.22	1.20	1.17	1.15	1.12	1.09	1.06	1.03	**1.00**	0.97	0.90	0.83	0.75	0.66
32	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.09	1.07	1.04	1.02	**1.00**	0.98	0.93	0.88	0.82	0.77
35	1.31	1.29	1.26	1.23	1.21	1.18	1.15	1.12	1.09	1.06	1.03	**1.00**	0.97	0.90	0.82	0.74	0.64
40	1.23	1.21	1.19	1.17	1.15	1.13	1.11	1.09	1.07	1.05	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	1.09	1.07	1.05	1.02	**1.00**	0.98	0.93	0.88	0.82	0.76
60	1.29	1.27	1.24	1.22	1.19	1.17	1.14	1.11	1.09	1.06	1.03	**1.00**	0.97	0.90	0.84	0.76	0.67
63	1.27	1.25	1.22	1.20	1.18	1.15	1.13	1.11	1.08	1.05	1.03	**1.00**	0.97	0.91	0.85	0.78	0.71

UL Recognized NC100H Supplementary Protectors—Rated Temperature

Ampere Ratings	-22°F / -30°C	-13°F / -25°C	-4°F / -20°C	5°F / -15°C	14°F / -10°C	23°F / -5°C	32°F / 0°C	41°F / 5°C	50°F / 10°C	59°F / 15°C	68°F / 20°C	77°F / 25°C	86°F / 30°C	104°F / 40°C	122°F / 50°C	140°F / 60°C	158°F / 70°C
10	1.36	1.33	1.30	1.27	1.24	1.21	1.18	1.14	1.11	1.07	1.04	**1.00**	0.96	0.88	0.78	0.68	0.56
15	1.36	1.33	1.30	1.27	1.24	1.21	1.18	1.14	1.11	1.07	1.04	**1.00**	0.96	0.88	0.78	0.68	0.55
16	1.30	1.27	1.25	1.22	1.20	1.17	1.15	1.12	1.09	1.06	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	1.13	1.10	1.06	1.03	**1.00**	0.97	0.89	0.82	0.73	0.63
25	1.31	1.29	1.26	1.23	1.21	1.18	1.15	1.12	1.09	1.06	1.03	**1.00**	0.97	0.90	0.82	0.74	0.64
30	1.35	1.32	1.29	1.26	1.23	1.20	1.17	1.14	1.11	1.07	1.04	**1.00**	0.96	0.88	0.79	0.69	0.58
32	1.34	1.31	1.28	1.25	1.22	1.19	1.16	1.13	1.10	1.07	1.04	**1.00**	0.96	0.89	0.80	0.71	0.60
35	1.26	1.24	1.22	1.19	1.17	1.15	1.13	1.10	1.08	1.05	1.03	**1.00**	0.97	0.92	0.86	0.79	0.72
40	1.32	1.29	1.27	1.24	1.21	1.19	1.16	1.13	1.10	1.07	1.03	**1.00**	0.97	0.89	0.81	0.73	0.63
50	1.41	1.38	1.35	1.31	1.28	1.24	1.21	1.17	1.13	1.09	1.04	**1.00**	0.95	0.85	0.74	0.60	0.43
60	1.41	1.38	1.35	1.31	1.28	1.24	1.21	1.17	1.13	1.09	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	1.15	1.12	1.08	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	1.14	1.11	1.07	1.04	**1.00**	0.96	0.88	0.76	0.69	0.58

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IEC Rated DPN-N Circuit Breakers—Rated Temperature

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
1		1.04	1.02	**1.00**	0.98	0.96	0.93	0.91	0.89	0.86
2		1.04	1.02	**1.00**	0.98	0.96	0.94	0.91	0.89	0.86
3		1.04	1.02	**1.00**	0.97	0.94	0.92	0.89	0.86	0.82
6		1.04	1.02	**1.00**	0.98	0.96	0.93	0.91	0.89	0.86
10		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.83

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
16		1.05	1.02	**1.00**	0.98	0.95	0.93	0.90	0.87	0.85
20		1.05	1.02	**1.00**	0.98	0.95	0.93	0.90	0.88	0.85
25		1.04	1.02	**1.00**	098	0.95	0.93	0.91	0.88	0.86
32		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.83
40		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.83

IEC Rated C60H Circuit Breakers (C Curve)—Rated Temperature
IEC Rated C60N Circuit Breakers (B and C Curves)—Rated Temperature

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
1		1.05	1.02	**1.00**	0.98	0.95	0.93	0.90	0.88	0.85
2		1.04	1.02	**1.00**	0.98	0.96	0.94	0.92	0.90	0.87
3		1.06	1.03	**1.00**	0.97	0.94	0.90	0.87	0.83	0.79
4		1.06	1.03	**1.00**	0.97	0.94	0.91	0.88	0.84	0.81
6		1.04	1.02	**1.00**	0.98	0.96	0.94	0.92	0.90	0.88
10		1.06	1.03	**1.00**	0.97	0.93	0.90	0.86	0.82	0.78
16		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.83

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
20		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.87	0.84
25		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.83
32		1.05	1.03	**1.00**	0.98	1.19	0.93	0.89	0.88	0.86
40		1.05	1.03	**1.00**	0.97	0.95	0.92	0.89	0.86	0.81
50		1.05	1.03	**1.00**	0.97	0.95	0.91	0.88	0.85	0.81
63		1.05	1.03	**1.00**	0.97	0.92	0.90	0.86	0.82	0.78

IEC Rated C60N Circuit Breakers (D Curve)—Rated Temperature
IEC Rated C60L Circuit Breakers (B, C, Z and K Curves)—Rated Temperature

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
1		1.10	1.08	1.05	1.03	**1.00**	0.97	0.95	0.92	0.89
2		1.09	1.07	1.04	1.02	**1.00**	0.98	0.95	0.93	0.90
3		1.14	1.10	1.07	1.04	**1.00**	0.96	0.92	0.88	0.84
4		1.13	1.10	1.06	1.03	**1.00**	0.97	0.93	0.89	0.86
6		1.08	1.06	1.04	1.02	**1.00**	0.98	0.96	0.93	0.91
10		1.14	1.11	1.07	1.04	**1.00**	0.96	0.92	0.88	0.84
16		1.12	1.09	1.06	1.03	**1.00**	0.97	0.94	0.90	0.87

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
20		1.11	1.08	1.06	1.03	**1.00**	0.97	0.94	0.91	0.88
25		1.11	1.08	1.06	1.03	**1.00**	0.97	0.94	0.91	0.87
32		1.10	1.07	1.05	1.03	**1.00**	0.97	0.95	0.92	0.89
40		1.11	1.09	1.06	1.03	**1.00**	0.97	0.94	0.91	0.87
50		1.12	1.09	1.06	1.03	**1.00**	0.97	0.93	0.90	0.86
63		1.14	1.11	1.07	1.04	**1.00**	0.96	0.92	0.88	0.84

IEC Rated C32H-DC Circuit Breakers—Rated Temperature

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
1		1.10	1.10	1.00	1.00	**1.00**	0.95	0.90	0.90	0.90
2		1.10	1.10	1.05	1.05	**1.00**	0.98	0.95	0.90	0.85
3		1.10	1.10	1.07	1.03	**1.00**	0.97	0.93	0.90	0.87
6		1.10	1.08	1.05	1.02	**1.00**	0.97	0.95	0.92	0.88
10		1.10	1.07	1.05	1.03	**1.00**	0.97	0.95	0.90	0.85

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
16		1.10	1.09	1.06	1.03	**1.00**	0.96	0.94	0.90	0.87
20		1.10	1.08	1.05	1.03	**1.00**	0.98	0.95	0.93	0.90
25		1.10	1.08	1.04	1.02	**1.00**	0.96	0.94	0.92	0.88
32		1.09	1.09	1.06	1.03	**1.00**	0.97	0.94	0.91	0.88
40		1.11	1.09	1.06	1.03	**1.00**	0.96	0.93	0.90	0.85

IEC Rated NC100 Circuit Breakers (B, C and D Curves)—Rated Temperature

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
10		1.10	1.07	1.05	1.03	**1.00**	0.95	0.90	0.87	0.85
16		1.06	1.03	1.00	1.00	**1.00**	0.97	0.94	0.91	0.88
20		1.13	1.10	1.05	1.03	**1.00**	0.95	0.93	0.90	0.85
25		1.08	1.06	1.04	1.02	**1.00**	0.96	0.92	0.90	0.88
32		1.13	1.09	1.06	1.03	**1.00**	0.97	0.92	0.88	0.84
40		1.14	1.10	1.08	1.04	**1.00**	0.96	0.93	0.88	0.84

Ampere Rating	°F	68	77	86	95	104	113	122	131	140
	°C	20	25	30	35	40	45	50	55	60
50		1.15	1.12	1.08	1.04	**1.00**	0.96	0.91	0.87	0.82
63		1.15	1.12	1.08	1.04	**1.00**	0.96	0.91	0.87	0.82
80		1.15	1.11	1.08	1.04	**1.00**	0.96	0.92	0.87	0.83
100		1.15	1.12	1.08	1.04	**1.00**	0.96	0.92	0.87	0.83
125		1.12	1.10	1.08	1.04	**1.00**	0.96	0.90	0.86	0.82

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Typical IEC Grounding Systems

All electrical installations complying with safety standards and regulations are grounded in order to protect people and equipment. The term “grounding system” standardizes the grounding method used in the installation.

The grounding system runs:

- First, from the neutral of the secondary side of the transformer,
- Next, from the installation frames

The IEC 364 (Section 3) Standard defines three types of grounding systems.

- TT
- IT
- TN-C or TN-S

Codification of the Grounding Systems

Grounding systems are referred to by two or three letters: T N S for example.

- 1st letter—status of the neutral of the transformer or source:
  - I : Ungrounded
  - T: Grounded
- 2nd letter—status of the electrical frames of the loads:
  - T: Grounded
  - N: Connected to neutral
- 3rd letter—status of the neutral (N) and the protective conductor (PE):
  - S: N and PE are separate
  - C: N and PE are in the same conductor (PEN)

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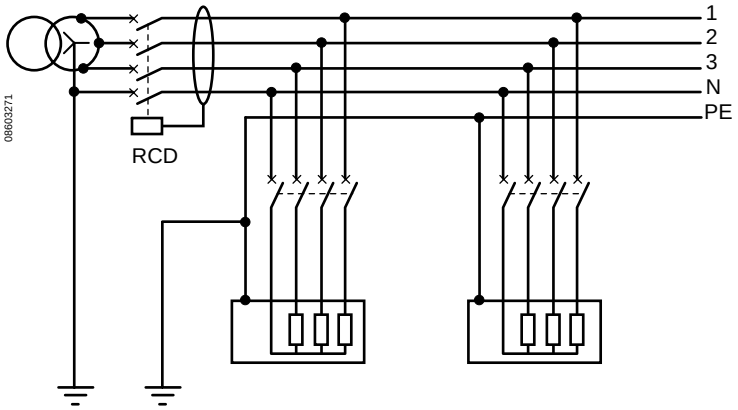
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The TT Grounded Neutral System

This “directly-grounded neutral” system is the easiest to install, monitor and use. Main features are:

- The neutral point of the distribution transformer is directly grounded.
- The installation frames are connected to several ground connections by the PE protective conductor.
- The frame and neutral ground connections are separate.

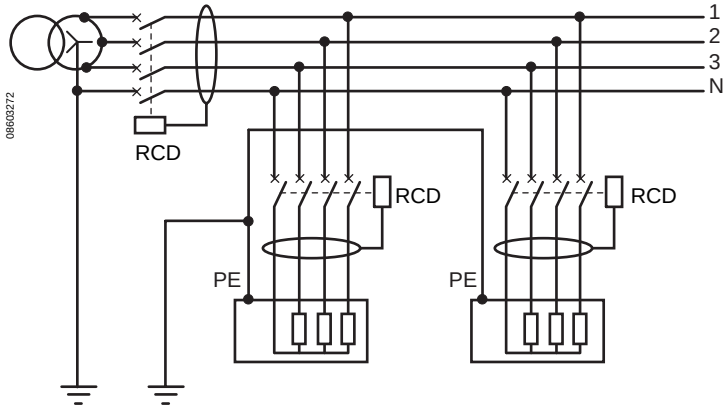
TT Grounding System with Residual Current Device (RCD) at the Incoming End of the Installation



System characteristics upon installation:

- Tripping is compulsory on the first fault.
- Thus, at least one RCD is necessary at the incoming end of the installation.
- If the load frames are not all connected to the same grounding connection, one RCD must be installed for each set of equipment.

TT Grounding System with One RCD for Each Set of Equipment



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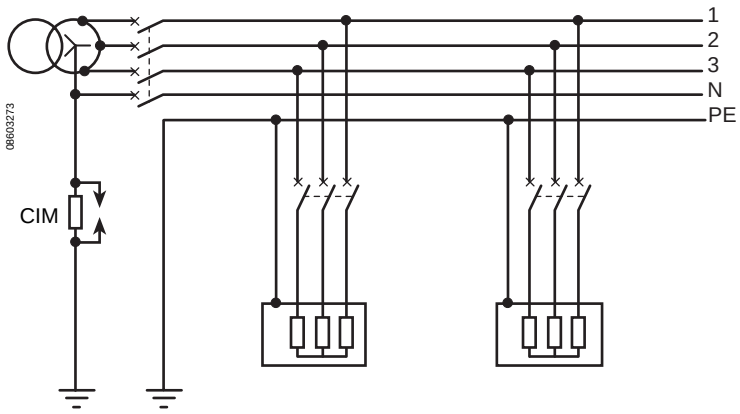
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The IT Grounding System

This “ungrounded neutral” system has the following main features:

- The neutral point of the distribution transformer is:
  - Ungrounded, or
  - Grounded by a high impedance
- The installation frames are connected to the same grounding connection by the PE protective conductor.

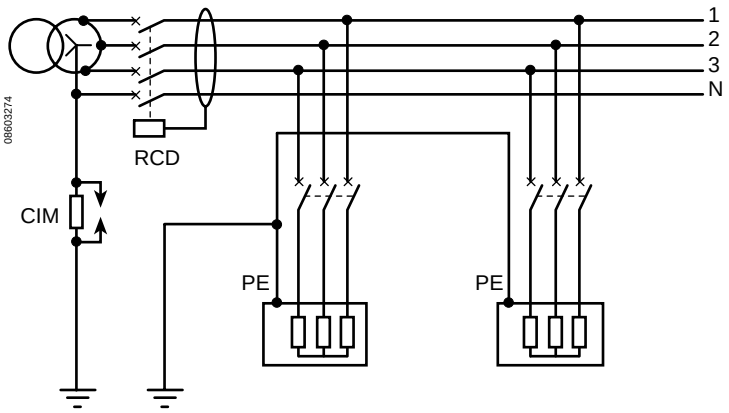
IT Grounding System without RCD



System characteristics and constraints upon installation:

- The appearance of the first insulation fault is risk-free for people.
- The appearance of the second insulation fault is dangerous to people, and thus requires tripping.
- If the application frames and the transformer frame are not all connected to the same ground connection, an RCD must be placed at the incoming end of the installation.
- The Standard stipulates the installation of a Continuous Insulation Monitor (CIM) at the incoming end of the installation.

IT Grounding System with RCD at the Incoming End of the Installation



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The TN-S Grounding System

This “multiple-grounded neutral” system has the following main features:

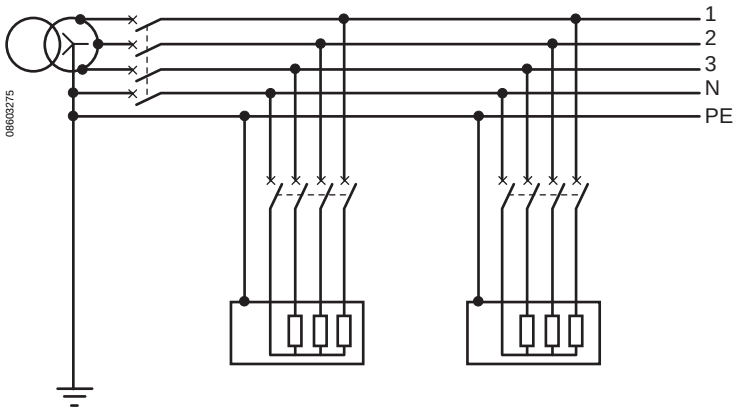
- The neutral point of the distribution transformer is grounded.
- All installation frames are grounded by a PE protective conductor.
- The PE protective conductors and the N neutral conductor are separate.

System characteristics and constraints upon installation:

- Allows tripping on the first fault via an overcurrent protection device.
- Use of an RCD, although not compulsory, is recommended.
- Requires calculation, sometimes complex, of loop impedance.
- Tripping of the protection devices must be checked when these devices are installed, B Curve is recommended.

This grounding system is compulsory on premises where there is a risk of explosion.

TN-S Grounding System



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Cat. No.	Page
MG10285	11
MG10286	11
MG10287	11
MG10288	11
MG10289	11
MG10290	11
MG10291	11
MG10292	11
MG10293	18,44
MG10294	18,44
MG10295	18,44
MG10296	18,44
MG10297	18,44
MG10298	18,44
MG10299	18,44
MG10300	18,44
MG10305	11,18,44
MG10306	11,18,44
MG10307	11,18,44
MG12279	6
MG17402	6
MG17403	6
MG17404	6
MG17405	6
MG17406	6
MG17407	6
MG17408	6
MG17409	6
MG17411	6
MG17412	6
MG17413	6
MG17414	6
MG17415	6
MG17416	6
MG17417	6
MG17418	6
MG17419	6
MG17421	6
MG17422	6
MG17423	6
MG17424	6
MG17425	6
MG17426	6
MG17427	6
MG17428	6
MG17429	6
MG17432	6
MG17433	6
MG17434	6
MG17435	6
MG17436	6
MG17437	6
MG17438	6
MG17439	6
MG17442	6
MG17443	6
MG17444	6
MG17445	6
MG17446	6
MG17447	6
MG17448	6
MG17449	6
MG17452	6
MG17453	6
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MG17456	6
MG17457	6
MG17458	6
MG17459	6
MG17461	6
MG17462	6
MG17463	6
MG17464	6
MG17466	6
MG17467	6
MG17468	6
MG17469	6
MG17471	6
MG17472	6
MG17473	6
MG17474	6
MG18256	13
MG18257	13
MG18258	13
MG18259	13
MG18261	13
MG18262	13
MG18263	13
MG18271	13
MG18273	13
MG18274	13
MG18276	13
MG18277	13
MG18278	13
MG18286	13
MG18287	13
MG18288	13
MG18289	13
MG18291	13
MG18292	13
MG18293	13
MG18310	30
MG18311	30
MG20531	34
MG20532	34
MG20533	34
MG20534	34
MG20535	34
MG20536	34
MG20537	34
MG20538	34
MG20539	34
MG20540	34
MG20541	34
MG20542	34
MG20543	34
MG20544	34
MG20545	34
MG20546	34
MG20547	34
MG20548	34
MG20549	34
MG20550	34
MG24110	6
MG24111	6
MG24112	6
MG24113	6
MG24114	6
MG24115	6
MG24116	6
MG24117	6
MG24118	6
MG24119	6
MG24120	6
MG24121	6
MG24122	6
MG24123	6
MG24124	6
MG24125	6
MG24126	6
MG24127	6
MG24128	6
MG24129	6
MG24130	6
MG24131	6
MG24132	6
MG24133	6
MG24134	6
MG24135	6
MG24136	6
MG24137	6
MG24138	6
MG24139	6
MG24140	6
MG24141	6
MG24142	6
MG24143	6
MG24144	6
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MG24488	6
MG24489	6
MG24490	6
MG24491	6
MG24500	6
MG24501	6
MG24502	6
MG24503	6
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MG24510	6
MG24511	6
MG24512	6
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MG24556	6
MG24557	6
MG24558	6
MG24559	6
MG24560	6
MG24561	6
MG24562	6
MG26925	8,28
MG26928	8,28
MG26964	8,28
MG26965	8,28
MG26966	8,28
MG26967	8,28
MG26968	8,28
MG26970	10
MG26972	8,28
MG26973	8,28
MG26974	8,28
MG26975	10
MG26976	10
MG26978	10
MG26981	10
MG26983	9
MG26984	9
MG26985	9
MG26986	16
MG26987	16
MG26988	16
MG26989	9
MG26990	16
MG26996	10
MG27001	10
MG27046	9,16
MG27047	9,16
MG27048	9,16
MG27053	10
MG27062	9,16
MG27121	15,41
MG27122	15,41
MG27125	13,15,41
MG27126	15,41
MG27128	15,41
MG27129	15,41
MG27130	15,41
MG27145	17
MG27150	9,16–17
MG27151	17
MG27152	17
MG27154	13
MG27155	13
MG27156	13
MG27157	13
MG27158	13
MG27159	13
MG27160	13
MG27162	13
MG27163	13
MG27164	13
MG27166	13
MG27167	13
MG27168	13
MG27169	13
MG27170	13
MG27171	13
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MG27189	13
MG27190	13
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MG27196	13
MG27197	13
MG27333	13
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MG27347	13
MG27348	13
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MG27355	13
MG27356	13
MG27357	13
MG27358	13
MG27359	13
MG27360	13
MG27366	13
MG27367	13
MG27368	13
MG27369	13
MG27370	13
MG27371	13
10503	55
10504	55
10512	55
125123	44
125183	44
125243	44
13326	54
13327	54
13328	54
13329	54
13429	55,57
13430	57
13576	55
13811	56
13812	56
13813	56
13814	56
13815	56
13816	56
13841	57
13842	57
13843	57
13844	57
13845	57
13846	57
13851	57
13852	57
13853	57
13854	57
13855	57
13856	57
13863	57

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Cat. No.	Page
13864	57
13871	57
13872	57
13876	57
13877	57
13880	57
14014	47
14180	55
14185	55
14210	9,16,31,42
14211	9,16,31,42
14881	33
14882	33
14883	33
14884	33
14885	33
14886	33
14887	33
14888	33
14891	33
14892	33
14893	33
14894	33
15005	47
15006	47
15007	47
15008	47
15009	47
15010	47
15011	47
15012	47
15013	47
15015	47
15016	47
15019	47
15020	47
15023	47
15024	47
15057	47
15058	47
15059	47
15060	47
15090	47
15091	47
15092	47
15093	47
15102	48
15103	48
15104	53
15105	53
15106	52
15107	52
15108	52
15109	52
15110	52
15115	52–53
15116	52–53
15117	52–53
15118	52–53
15119	52–53
15129	48
15130	48
15131	48
15136	53
15137	53
15138	53
15141	52
15142	52
15143	52–53
15144	52–53
15145	52
15146	52
15440	51
15443	51
15683	49
15686	49
15691	49
15694	49
16200	46
16201	46
16204	46
16208	46
16212	46
16251	46
16254	46
16258	46
16265	46
16266	46
19249	19
19250	19
19252	19
19254	19
19255	19
19256	19
19257	19
19258	19
19260	19
19261	19
19263	19
19264	19
19266	19
19268	19
19269	19
19270	19
19271	19
19272	19
19650	19
19651	19
19653	19
19655	19
19656	19
19657	19
19658	19
19659	19
19661	19
19663	19
19665	19
19666	19
19667	19
19668	19
19669	19
19670	19
19671	19
19673	19
19675	19
19676	19
19677	19
19678	19
19679	19
19681	19
19683	19
19685	19
19686	19
19687	19
19688	19
19689	19
23028	46
23032	46
23034	46
23035	46
23059	46
24045	22
24046	22
24047	22
24048	22
24049	22
24050	22
24051	22
24052	22
24053	22
24054	22
24055	22
24056	22
24057	22
24067	22
24068	22
24069	22
24070	22
24071	22
24072	22
24073	22
24074	22
24075	22
24076	22
24077	22
24078	22
24079	22
24080	22
24081	22
24082	22
24083	22
24084	22
24085	22
24086	22
24087	22
24088	22
24089	22
24090	22
24091	22
24092	22
24093	22
24094	22
24095	22
24096	22
24097	22
24098	22
24099	22
24100	22
24101	22
24102	22
24103	22
24104	22
24105	22
24106	22
24107	22
24108	22
24109	22
24331	22
24332	22
24333	22
24334	22
24335	22
24336	22
24337	22
24338	22
24339	22
24340	22
24341	22
24342	22
24343	22
24344	22
24345	22
24346	22
24348	22
24349	22
24350	22
24351	22
24352	22
24353	22
24354	22
24355	22
24356	22
24357	22
24358	22
24359	22
24360	22
24361	22
24362	22
24363	22
24364	22
24365	22
24366	22
24367	22
24368	22
24369	22
24395	22
24396	22
24397	22
24398	22
24399	22
24401	22
24403	22
24404	22
24405	22
24406	22
24407	22
24408	22
24409	22
24625	22
24626	22
24627	22
24628	22
24629	22
24630	22
24632	22
24633	22
24634	22
24635	22
24636	22
24637	22
24638	22
24643	23
24644	23
24645	23
24646	23
24647	23
24648	23
24649	23
24650	23
24651	23
24652	23
24653	22
24654	22
24655	22
24656	22
24657	22
24658	22
24660	22
24661	22
24662	22
24663	22
24664	22
24665	22
24666	22
24667	22
24668	22
24669	22
24670	22
24671	22
24672	22
24674	22
24675	22
24676	22
24677	22
24678	22
24679	22
24680	22
24681	22
24682	22
24683	22
24684	22
24685	22
24686	22
24688	22
24689	22
24690	22
24691	22
24692	22
24693	22
24694	22
24725	23
24726	23
24727	23
24728	23
24729	23
24730	23
24731	23
24732	23
24733	23
24738	23
24739	23
24740	23
24741	23
24742	23
24743	23
24744	23
24745	23
24746	23
24751	23
24752	23
24753	23
24754	23
24755	23
24756	23
24757	23
24758	23
24759	23
24900	23
24901	23
24902	23
24903	23
24906	23
24907	23
24908	23
24909	23
24968	23
24969	23
24970	23
24971	23
24972	23
24973	23
24974	23
24975	23
24976	23
24977	23
24978	23
24979	23
24980	23
24981	23
24982	23
24983	23
24984	23
24985	23
24986	23
24987	23
24988	23
24989	23
24990	23
24991	23
24992	23
24993	23
24994	23
24995	23
24996	23
24997	23
24998	23
24999	23
25000	23
25001	23
25002	23
25003	23
25004	23
25005	23
25006	23
25007	23
25008	23
25009	23
25010	23
25011	23
25012	23
25013	23
25014	23
25015	23
25016	23
25017	23
25018	23
25019	23
25152	23
25155	23
25157	23
25158	23
25159	23
25160	23
25161	23
25164	23
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25168	23
25169	23
25171	23
25172	23
25173	23
25174	23
25183	23
25184	23
25185	23
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25189	23
25190	23
25191	23
25192	23
25193	23
25194	23
25195	23
25196	23
25197	23
25198	23
25199	23
25200	23
25201	23
25202	23
25203	23
25205	23
25207	23
25208	23
25209	23
25210	23

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Cat. No.	Page
25211	23
25212	23
25213	23
25214	23
25215	23
25216	23
25217	23
25218	23
25219	23
25220	23
25221	23
25222	23
25223	23
25331	24
25332	24
25333	24
25334	24
25335	24
25336	24
25337	24
25338	24
25339	24
25357	24
25358	24
25359	24
25360	24
25361	24
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25364	24
25365	24
25370	24
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25399	24
25400	24
25401	24
25402	24
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25406	24
25407	24
25408	24
25409	24
25418	24
25419	24
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25478	24
25479	24
25480	24
25481	24
25482	24
25483	24
25485	24
25486	24
25487	24
25488	24
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26362	22
26368	22
26369	22
26370	22
26580	26
26581	26
26611	26
26616	26
26618	26
26620	26
26631	26
26636	26
26643	26
26648	26
26650	26
26923	28
26924	8,28
26927	8,28
26946	8,28
26947	8,28
26948	8,28
26960	8,28
26961	8,28
26962	8,28
26963	8,28
26975	32
26976	32
26978	32
26981	32
26983	31
26984	31
26985	31
26986	42
26987	42
26988	42
26989	31
26990	42
26996	32
27046	31,42
27047	31,42
27048	31,42
27062	31,42
27132	15,41
27135	15,41
27136	15,41
27137	15,41
27138	15,41
27140	15,41
27143	15,41
27145	32,43
27150	31–32,42–43
27151	43
27152	43
27201	36
27202	36
27203	36
27204	36
27205	36
27206	36
27207	36
27208	36
27209	36
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27211	36
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27308	36
27309	36
27311	36
27312	36
27313	36
27314	36
27315	36
27316	36
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27319	36
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27401	37
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27406	37
27410	37
27411	37
27412	37
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27415	37
27416	37
27417	37
27421	37
27422	37
27423	37
27424	37
27425	37
27426	37
27427	37
27428	37
27432	37
27433	37
27434	37
27435	37
27436	37
27437	37
27438	37
27439	37

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Cat. No.	Page	Cat. No.	Page	Cat. No.	Page	Cat. No.	Page	Cat. No.	Page
27443	37	27459	37	27522	37	27538	37	27831	39
27444	37	27460	37	27523	37	27542	37	27833	39
27445	37	27461	37	27524	37	27543	37	27835	39
27446	37	27509	37	27525	37	27544	37	27840	39
27447	37	27510	37	27526	37	27545	37	27842	39
27448	37	27511	37	27527	37	27546	37	325123	33
27449	37	27512	37	27531	37	27547	37	325183	33
27450	37	27513	37	27532	37	27548	37	325243	33
27454	37	27514	37	27533	37	27549	37	3DC123	33
27455	37	27515	37	27534	37	27818	39	3DC163	33
27456	37	27516	37	27535	37	27823	39	3DC203	33
27457	37	27520	37	27536	37	27825	39		
27458	37	27521	37	27537	37	27826	39		

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