

Merlin Gerin Multi 9 System Protection Miniature Circuit Breakers



Protection

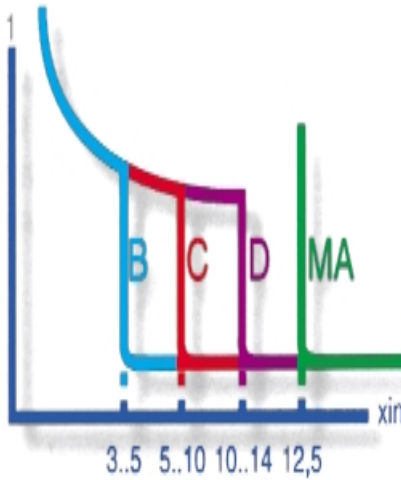
Merlin Gerin Multi 9 System
Miniature circuit breakers
Tripping curves
Markings & limitation capability

Trip Unit Variations

Circuit Breaker Marking

Circuit Protection

A choice of several curves
Whatever circuit has to be protected, a C60 or C120 circuit breaker provides the perfect solution with a suitable curve.



Curve B
tripping:
3 to 5 times the rated current (I_n);
protection of generators,
persons, very long
cables.



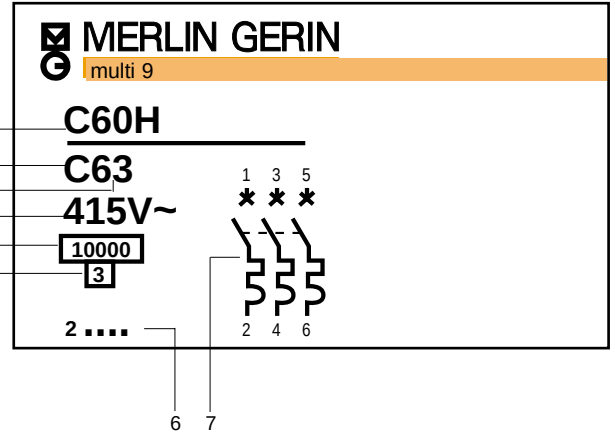
Curve C
tripping:
5 to 10 I_n ;
protection of circuits,
general applications.



Curve D
tripping:
10 to 14 I_n ;
protection of high surge
circuits, welders, trans-
formers, motors.



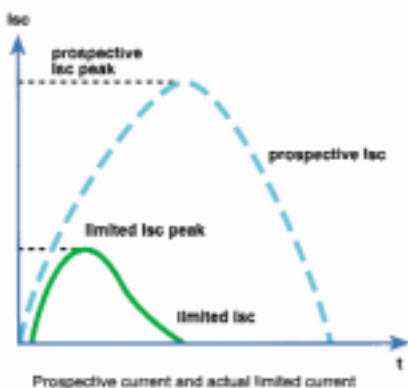
Curve MA
(magnetic only)
tripping: 12 I_n ;
protection of motor
starters (+ thermal pro-
tection when combined
with contactor).



1. Circuit Breaker Model Number
2. Tripping Curve
3. Circuit Breaker Current Rating
4. Operating Voltage
5. Rated Breaking Capacity
6. Circuit Breaker Part Number
7. Electrical Diagram - No. of Poles
8. I't classification

Circuit Breaker Limitation Capability

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



This is illustrated by limitation curves which give:

- The limited peak current in relation to the RMS value of the prospective short-circuit current (the short-circuit current being that current which would flow continuously in the absence of protection equipment).
- The limited current stress in relation to the RMS value of the prospective short-circuit current.
- Current limiting capability. The advanced design of the Multi-9 range provides current limitation with far better protection than conventional circuit breakers. For example, on a 6A rating with a prospective short circuit of 5000A, the current will be limited at 350A or 7%.

Installation of current limiting circuit breakers offers several advantages:

- **Better network protection**
Current limiting circuit breakers considerably reduce the undesirable effects of short-circuit currents in an installation.
- **Reduced thermal effects**
Cable heating is reduced, hence longer cable life.
- **Reduced mechanical effects**
Electrodynamic forces reduced, thus electrical contacts are less likely to be deformed or broken.
- **Reduced electromagnetic effects**
Measuring equipment situated near an electrical circuit less affected.

Miniature Circuit Breakers – up to 63A

Page

18mm pole width



C60a – 4.5kA	2
C60N – 6kA	3
C60H – 10kA	4
C32H-DC – 10kA (circuit breakers for DC applications)	18
electrical auxiliaries – C60	10
accessories – C60	16

Miniature Circuit Breakers – up to 125A

27mm pole width



C120N – 10kA	6
C120H – 15kA	8
electrical auxiliaries – C120	10
accessories – C120	16

Tm Motor Mechanism

TM C60/C120	21
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Dimensions

For supplementary technical information, consult AUS010306

C60a circuit-breakers

4.5 kA, C curve

AS/NZS 4898



Approval No: N13634

functions

The circuit-breakers combine the following functions:

- protection of circuits against short-circuit currents,
- protection of circuits against overload currents,
- control,
- isolation,

- protection of persons against indirect contact.

- C60a circuit-breakers are used in the domestic sectors where single phase fault levels are less than or equal to 4.5kA.

description**technical data****C60a circuit-breakers**

- power circuit
 - voltage rating: 240 V AC
 - number of cycles (O-C): 10 000
 - foolproof terminal design
 - moving barrier prevents incorrect cable insertion
 - cable strand centering guides ensure correct cable positions and strand grouping
 - isolation with positive contact indication
 - bistable din clip, simplifies disassembly
- environment
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55 °C)
 - connection: tunnel terminals for the following cables:
 - up to 25A : 25mm² stranded
 - 32 to 63A : 35mm² stranded

C curve**utilisation**

cables feeding conventional loads.

technical data

- power circuit
 - tripping curves: the magnetic trip unit operates between 5 and 10 I_n
 - breaking capacity
 - according to AS/NZS 4898 Icu ultimate breaking capacity (0-C0 cycle):

rating (A)	voltage (V)	breaking capacity Icu (A)
1...63	240	4500

catalogue numbers

11357

type	rating (A)	catalogue number	width in mod. of 9 mm	quantity per box
C curve C60a				
1P 	6	11354	2	12
	10	11355	2	12
	16	11356	2	12
	20	11357	2	12
	25	11339	2	12
	32	11358	2	12
	40	11359	2	12
	50	11360	2	12
	63	11361	2	12

C60N circuit-breakers

6kA, C curve

AS/NZS 4898



Approval No: N13634

functions

The circuit-breakers combine the following functions:

- protection of circuits against short-circuit currents,
- protection of circuits against overload currents,
- control,

- isolation,
- protection of persons against indirect contact.

description**technical data common to C60N circuit breakers**

- power circuit
 - voltage rating: 240/415 V AC
 - for 2P single phase 240/480V
 - I^2t classification: 3
 - number of cycles (O-C): 20 000
 - foolproof terminal design
 - moving barrier prevents incorrect cable insertion
 - cable strand centering guides ensure correct cable positions and strand grouping
 - isolation with positive contact indication
 - bistable din clip, simplifies disassembly

- environment
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55 °C)
 - connection: tunnel terminals for the following cables:
 - up to 25A : 16mm² flexible with cable end : 25mm² stranded
 - 32 to 63A : 25mm² flexible with cable end : 35mm² stranded

C curve**utilisation**

cables feeding conventional loads.

technical data

- power circuit
 - tripping curves: the magnetic trip units operate between 5 and 10 I_n
 - breaking capacity according to AS/NZS 4898, I_{cu} ultimate breaking capacity (O-CO cycle):

rating (A)	type	voltage (V)	breaking capacity I_{cu} (A)
1...63	1P	240/415	6 000
	2P	415...480	6 000
	3P	415	6 000

catalogue numbers

25804



25818



25832

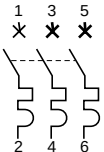
type	rating (A)	catalogue number
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C curve C60N**1P**Width in mod
of 9mm - 2

1	25797
2	25798
4	25800
6	25801
10	25802
16	25803
20	25804
25	25805
32	25806
40	25807
50	25808
63	25809

2PWidth in mod
of 9mm - 4

1	25811
2	25812
4	25814
6	25815
10	25816
16	25817
20	25818
25	25819
32	25820
40	25821
50	25822
63	25823

3PWidth in mod
of 9mm - 6

1	25825
2	25826
4	25828
6	25829
10	25830
16	25831
20	25832
25	25833
32	25834
40	25835
50	25836
63	25837

C60H circuit-breakers

10kA, B, C and D curves

AS/NZS 4898



Approval No: N13634

functions

The circuit-breakers combine the following functions:

- protection of circuits against short-circuit currents,
- protection of circuits against overload currents,
- control,

- isolation,
- protection of persons against indirect contact.

description**technical data common to C60H circuit-breakers**

- power circuit
- voltage rating: 240/415 V AC
- breaking capacity
- according to AS/NZS 4898,
- Icu ultimate breaking capacity (O-CO cycle):

rating (A)	type	voltage (V)	break. cap. Icu (A)
1...63	1P, 2P	240/415	10 000
	3P, 4P	415...480	10 000

- I²t classification: 3
- foolproof terminal design
- moving barrier prevents incorrect cable insertion
- cable strand centering guides ensure correct cable positions and strand grouping
- isolation with positive contact indication
- bistable din clip, simplifies disassembly
- isolation with positive contact indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening of all the poles
- number of cycles (O-C): 20 000

- environment
- tropicalisation: treatment 2 (relative humidity: 95 % at 55 °C)
- connection: tunnel terminals for the following cables:
 - up to 25A :16mm² flexible with cable end; 25mm² stranded
 - 32 to 63A :25mm² flexible with cable end; 35mm² stranded

B curve**utilisation**

when there are small inrush currents (generators, long cables).

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 3 and 5 I_n.

C curve**utilisation**

cables feeding conventional loads.

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 5 and 10 I_n.

D curve**utilisation**

loads with a high inrush current (motors, transformers).

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 10 and 14 I_n.

C60H circuit-breakers

10kA, B, C and D curve

AS/NZS 4898



Approval No: N13634

catalogue numbers

25845



25857



25871



25883

type	rating (A)	B Curve	C Curve	D Curve
C60H				
1P Width in mod of 9mm - 2	1	25839	25639	25695
	2	25840	25640	25696
	4	25841	25642	25698
	6	25842	25643	25699
	10	25843	25644	25700
	16	25844	25645	25701
	20	25845	25646	25702
	25	25846	25647	25703
	32	25847	25648	25704
	40	25848	25649	25705
	50	25849	25651	25707
	63	25850	25652	25708
2P Width in mod of 9mm - 4	1	25852	25653	25709
	2	25853	25654	25710
	4	25854	25656	25712
	6	25855	25656	25713
	10	25856	25658	25714
	16	25857	25659	25715
	20	25858	25660	25716
	25	25859	25661	25717
	32	25860	25662	25718
	40	25861	25663	25719
	50	25862	25665	25721
	63	25863	25666	25722
3P Width in mod of 9mm - 6	1	25865	25667	25723
	2	25866	25668	25724
	4	25867	25670	25726
	6	25868	25671	25727
	10	25869	25672	25728
	16	25870	25673	25729
	20	25871	25674	25730
	25	25872	25675	25731
	32	25873	25676	25732
	40	25874	25677	25733
	50	25875	25679	25735
	63	25876	25680	25736
4P Width in mod of 9mm - 8	1	25878	25007	25211
	2	25879	25008	25212
	4	25880	25010	25214
	6	25881	25011	25215
	10	25882	25012	25216
	16	25883	25013	25217
	20	25884	25014	25218
	25	25885	25015	25219
	32	25886	25016	25220
	40	25887	25017	25221
	50	25888	25018	25222
	63	25889	25019	25223

C120N circuit-breakers

10kA, B, C curves - AS/NZS 4898

10kA, D curve AS 3947-2

function

The circuit-breakers combine the following functions:

- protection of circuits against short circuit currents,
- protection of circuits against overload currents,
- control,

- isolation,
- protection of persons against indirect contact.

description**Technical data common to C120N circuit breakers**

- power circuit
- current rating: 63 to 125 A
- voltage rating 415 V AC
- insulation voltage U_i : 500 V
- impulse withstand voltage U_{imp} : 6 kV
- breaking capacity:
 - according to AS/NZS 4898 Icu ultimate breaking capacity (O-CO cycle)

type	voltage (V)	breaking cap. Icu (A)
1, 2, 3, 4P	240/415	10000

- according to AS3947-2 Icu ultimate breaking capacity (O-CO cycle)

type	voltage (V)	breaking cap. Icu (kA)
1P	240	10
	415	3
2, 3, 4P	400...415	10

- mechanical durability:
 - 20000 cycles (O-C)
- electrical durability:
 - 63 A: 10000 cycles (O-C)
 - 80...125 A: 5000 cycles (O-C)
- I^2t classification: 3
- isolation with positive contact indication:
 - opening is indicated by a green strip on the device operating handle. This indicator shows opening of all the poles
- foolproof terminal design
 - moving barrier prevents incorrect cable insertion
 - cable strand centering guides ensure correct cable positions and strand grouping
- bistable din clip: simplifies disassembly
- 63 to 125A:
 - up to 35mm² flexible with cable end
 - up to 50mm² stranded

B curve

Approval No: Q00542

utilisation

when there are small inrush currents (generators, long cables).

technical data

- power circuit
- tripping curve:
 - the magnetic trip units operate between 3 and 5 In.

C curve

Approval No: Q00542

utilisation

cables feeding conventional loads.

technical data

- power circuit
- tripping curve:
 - the magnetic trip units operate between 5 and 10 In.

D curve - For industrial use only**utilisation**

loads with a high inrush current (motors, transformers).

technical data

- power circuit
- tripping curve:
 - the magnetic trip units operate between 10 and 14 In.

C120N circuit-breakers

10kA, B, C curves - AS/NZS 4898

10kA, D curve AS 3947-2

catalogue numbers



18340

type	rating (A)	B Curve	C Curve	D Curve
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B curve C120N

1P	63	18340	18356	18378
	80	18341	18357	18379
1	100	18342	18358	18380
1 1/2	125	18343	18359	18381

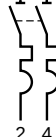


Width in mod
of 9mm - 3



18344

2P	63	18344	18360	18382
	80	18345	18361	18383
1 3	100	18346	18362	18384
1 3 1/2	125	18347	18363	18385

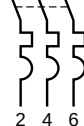


Width in mod
of 9mm - 6



18349

3P	63	18348	18364	18386
	80	18349	18365	18387
1 3 5	100	18350	18367	18388
1 3 5 1/2	125	18351	18369	18389

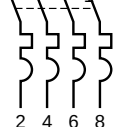


Width in mod
of 9mm - 9



18355

4P	63	18352	18371	18390
	80	18353	18372	18391
1 3 5 7	100	18354	18374	18392
1 3 5 7 1/2	25	18355	18377	18393



Width in mod
of 9mm - 12

C120H circuit-breakers

15kA, B, C curves - AS/NZS 4898

15kA, D curve AS 3947-2

function

The circuit-breakers combine the following functions:

- protection of circuits against short circuit currents,
- protection of circuits against overload currents,
- control,

- isolation,
- protection of persons against indirect contact.

description

Technical data common to C120N circuit breakers

- power circuit
- current rating: 10 to 125 A
- voltage rating 415 V AC
- insulation voltage U_i : 500 V
- impulse withstand voltage U_{imp} : 6 kV
- breaking capacity:
 - according to AS/NZS 4898 Icu ultimate breaking capacity (O-CO cycle)

type	voltage (V)	breaking cap. Icu (A)
1, 2, 3, 4P	240/415	15000

- according to AS3947-2 Icu ultimate breaking capacity (O-CO cycle)

type	voltage (V)	breaking cap. Icu (kA)
1P	240	15
	415	4.5
2, 3, 4P	400...415	15

- mechanical durability:
 - 20000 cycles (O-C)
- electrical durability:
 - 63 A: 10000 cycles (O-C)
 - 80...125 A: 5000 cycles (O-C)
- I^2t classification: 3
- isolation with positive contact indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening of all the poles
- foolproof terminal design
- moving barrier prevents incorrect cable insertion
- cable strand centering guides ensure correct cable positions and strand grouping
- bistable din clip: simplifies disassembly
- 63 to 125A:
 - up to 35mm² flexible with cable end
 - up to 50mm² stranded

B curve



Approval No: Q00542

utilisation

when there are small inrush currents (generators, long cables).

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 3 and 5 I_n .

C curve



Approval No: Q00542

utilisation

cables feeding conventional loads.

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 5 and 10 I_n .

D curve - For industrial use only

utilisation

loads with a high inrush current (motors, transformers).

technical data

- power circuit
- tripping curve: the magnetic trip units operate between 10 and 14 I_n .

C120H circuit-breakers

15kA, B, C curves - AS/NZS 4898

15kA, D curve AS 3947-2

catalogue numbers



18394



18412



18424



18437

type	rating (A)	B Curve	C Curve	D Curve
C120H				
1P Width in mod of 9mm - 3	10	18394	18438	18482
	16	18395	18439	18483
	20	18396	18440	18484
	25	18397	18441	18485
	32	18398	18442	18486
	40	18399	18443	18487
	50	18400	18444	18488
	63	18401	18445	18489
	80	18402	18446	18490
	100	18403	18447	18491
	125	18404	18448	18492
2P Width in mod of 9mm - 6	10	18405	18449	18493
	16	18406	18449	18494
	20	18407	18451	18495
	25	18408	18452	18496
	32	18409	18453	18497
	40	18410	18454	18498
	50	18411	18455	18499
	63	18412	18456	18500
	80	18413	18457	18501
	100	18414	18458	18502
	125	18415	18459	18503
3P Width in mod of 9mm - 9	10	18416	18460	18504
	16	18417	18461	18505
	20	18418	18462	18506
	25	18419	18463	18507
	32	18420	18464	18508
	40	18421	18465	18509
	50	18422	18466	18510
	63	18423	18466	18511
	80	18424	18468	18512
	100	18425	18469	18513
	125	18426	18470	18514
4P Width in mod of 9mm - 12	10	18427	18471	18515
	16	18428	18472	18516
	20	18429	18473	18517
	25	18430	18474	18518
	32	18431	18475	18519
	40	18432	18476	18520
	50	18433	18477	18521
	63	18434	18478	18522
	80	18435	18479	18523
	100	18436	18480	18524
	125	18437	18481	18525

electrical auxiliaries for C60 and C120 circuit-breakers

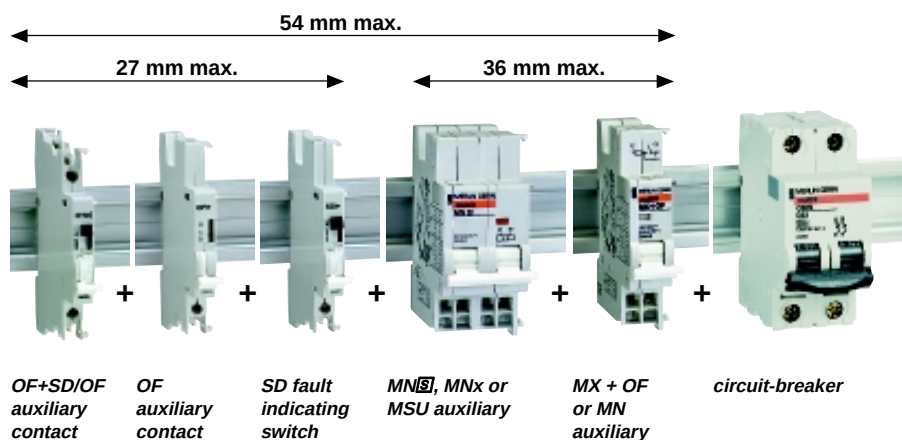
function

They allow remote tripping or indication of circuit-breakers, with or without a Vigi module.

description

- they are mounted on the left-hand side of the circuit-breaker within a width limit of 54 mm
- fixed using clips (without tools) on the left-hand side of the circuit-breaker
- compatible with Vigi modules (adaptable on the right-hand side)
- a maximum of 3 indication auxiliaries on the same circuit-breaker
- a maximum of 2 OF+SD/OF auxiliary switches on the same circuit-breaker
- a maximum of 2 MX+OF or MN tripping auxiliaries on the same circuit-breaker
- a maximum of 1 MN⁵ or MNx or MSU tripping auxiliary on the same circuit-breaker.

auxiliary combination



electrical auxiliaries

for C60 and C120 circuit-breakers

tripping

Visualisation of tripping by means of the red indicator on front face.

MX + OF shunt trip

Remote tripping of a circuit-breaker:

- equipped with an OF changeover switch:
 - to indicate the circuit-breaker's position
 - to carry out self-breaking allowing the control circuit to remain energized.

Undervoltage releases

(MN, MN )

Controls the tripping of a circuit-breaker when its supply voltage drops

(threshold between 70 and 35 % of U_n)

It allows for manual closing of the circuit-breaker if its voltage exceeds 85 % of the rated voltage

delayed MN release

0.2 second time-delay: prevents tripping due to brownouts or momentary voltage decreases.

MNx release for opening pushbutton

Completely unaffected by power supply circuit cuts, it is recommended for fail-safe emergency stopping. Replaces the MX "voluntary" release equipped with its NO/NC indicator lights.

MSU overvoltage

MSU voltage threshold release

Specially designed to monitor voltage between the neutral and phase(s) conductors, it cuts power supply by opening the circuit-breaker in event of an overvoltage. For overvoltages lasting for more than a few seconds.

technical data

Compliance with standard: AS 3947-2

□ release consumption

type	voltage (V AC or DC)		power (W or VA)
MX+OF	415 V	AC inrush	120
	220...240 V	AC inrush	50
	110...130 V	AC inrush	200
		DC inrush	10
	48 V	AC inrush	22
		DC inrush	12
	24 V	AC inrush	120
		DC inrush	120
	12 V	AC inrush	20
		DC inrush	20
MN	220...240 V	AC holding	4.1
	48 V	AC holding	4.3
		DC holding	2.0
MN 	220...240 V	AC holding	4.1
MNx	230	AC inrush	50
	400	AC inrush	120
MSU	230	AC inrush	50
	400	AC inrush	120

remote indication

OF auxiliary switch

- changeover switch that indicates the "open" or "closed" position of the circuit-breaker.
- test button on the front face that allows for the indication circuit to be verified without operating the circuit-breaker

SD fault indicating switch

- changeover switch that indicates the "fault trip" position of the circuit-breaker
- visualisation of the fault (SD) by means of a mechanical indicator on front face.

OF+SD/OF selector switch

- double changeover switch that indicates:
 - the "open" or "closed" position of the circuit-breaker (OF)
 - the "fault trip" position of the circuit-breaker (SD).
- 2 circuits:
 - upper: OF
 - lower: SD or OF.
- function is selected using rotary selector switch on the right-hand side
- the selected function is indicated on the front face
- visualisation of the fault (SD) by means of a red mechanical indicator on front face.

technical data

Complies with standard: AS 3947-2

□ rated current of auxiliary contacts

voltage (V AC or DC)		rated current (A)
415 V	AC	3
≤ 240 V	AC	6
130 V	DC	1
≤ 48 V	DC	2
≤ 24 V	DC	6

connection

- using screw clamp terminals for 1 or 2 cables (max. 2.5 mm²)
- visible markers near terminals.

electrical auxiliaries

for C60 and C120 circuit-breakers

references

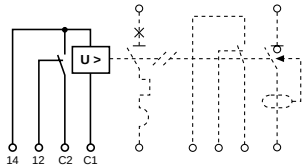


26946

type

control voltage
(V AC) (V DC) catalogue
number width
in mod.
of 9 mm

MX + OF shunt release



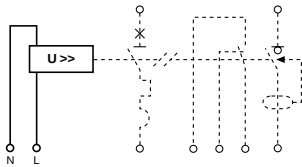
220...415	110...130	26946	2
48...130	48	26947	2
24	24	26948	2
12	12	26949	2



26979

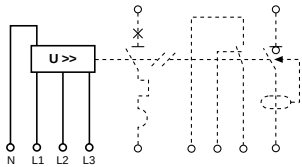
MSU overvoltage release

1P + N



220...240	26979	4
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3P + N



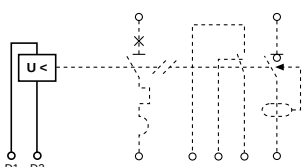
380...415	26980	4
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26963

MN undervoltage release

instantaneous



220...240	26960	2
48	26961	2
48	26962	2

delayed 

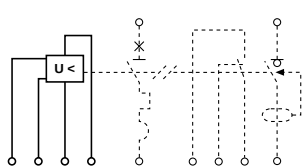
220...240	26963	4
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26969

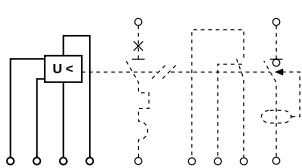
MNx release for opening pushbutton

Ph + N



220...240	26969	4
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Ph to Ph



380...415	26971	4
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electrical auxiliaries

for C60 and C120 circuit-breakers

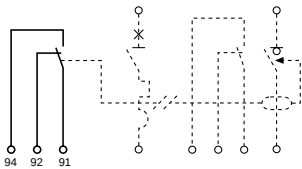


26927

type

control voltage (V AC)	(V DC)	catalogue number	width in mod. of 9 mm
---------------------------	--------	---------------------	-----------------------------

SD fault indicating switch

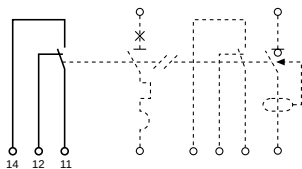


26927 1



26924

OF auxiliary contact

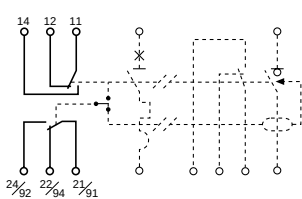


26924 1



26929

OF+SD/OF selector switch



26929 1

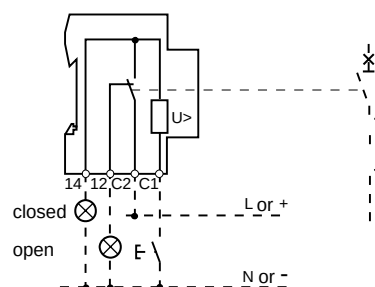
OF contact and SD switch, MX+OF, MN and MN^S releases for C60 and C120 circuit-breakers

shunt release MX + OF

application

- remote opening by circuit-breaker tripping, of electrical lighting circuits, etc
- terminals 12 and 14 are used for indication of the circuit-breaker OF position, at a voltage identical to coil voltage
- indication on the front face of the tripped function, by a red mechanical indicator.

connection

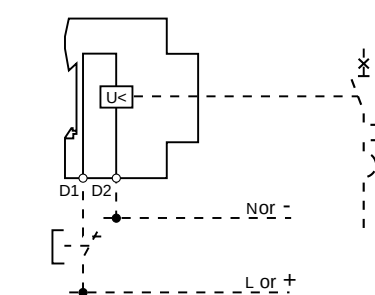


undervoltage release MN or MN^S

application

- opening of electrical circuits by circuit-breaker tripping:
 - either by emergency stopping (mushroom head pushbutton)
 - or on mains failure
- impossibility of uncontrolled restart is particularly recommended in two cases, thus guaranteeing complete safety:
 - when the machine operator is confronted with a risk of untimely restart: circular saw, rotating machine, etc
 - when it is necessary to control restart of an installation further to a mains failure
- indication on the front face of the tripped function, by a red mechanical indicator
- the MN coil is accepted as an emergency stopping device by the installation standard. However it does not indicate the OFF position of a circuit-breaker.

connection

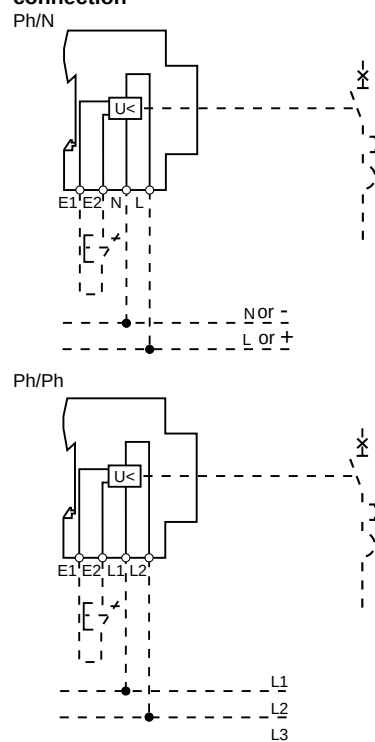


MNx release for emergency stopping on opening

application

- remote opening of the circuit by circuit-breaker tripping on a voluntary order:
 - emergency stop pushbutton on opening (fail-safe)
 - completely unaffected by network fluctuations.

connection



OF contact and SD switch, MX+OF, MN and MN^S releases for C60 and C120 circuit-breakers

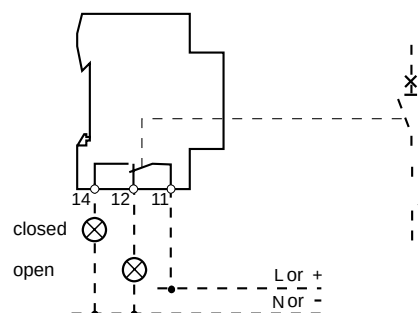
OF auxiliary contact

application

- audible or visual indication of circuit-breaker "open" or "closed" contact status
- this indication can be transferred to the front face of a cubicle or enclosure or centralised on a control desk
- optional contact testing using the knob on the front face, with the circuit-breaker open.

circuit-breaker	OF contact position
open	11-12
closed	11-14
tripped	11-12

connection



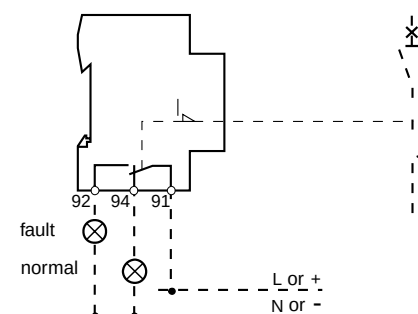
SD fault indicating switch

application

- audible or visual indication of circuit-breaker tripped status: climatic room, lift, ventilation, etc
- front face indication of contact status (red mechanical indicator) and of the "fault clearance" function
- optional resetting of indication separately from the circuit-breaker
- optional testing of contact on front face, with the circuit-breaker open.

circuit-breaker	OF contact position
open	91-94
closed	91-94
tripped	91-92

connection



OF + SD/OF changeover auxiliary switch

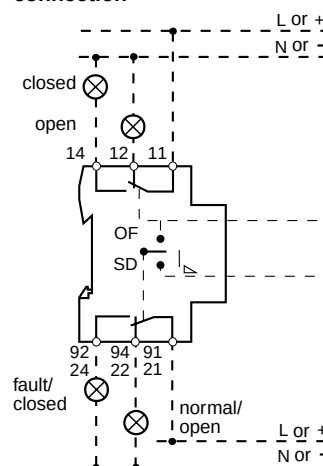
application

- double changeover switch:
 - the top switch indicates the "open" or "closed" status of the circuit-breaker
 - the bottom switch indicates according to user choice:
 - the "open" or "closed" status (OF)
 - the "tripped" status (SD)
- front face indication of the tripped status, by red mechanical indicator (regardless of lateral selector switch position)
- optional testing of the bottom switch (SD changeover) on the front face, with the circuit-breaker open
- optional resetting of indication separately from the circuit-breaker.

circuit-breaker	OF contact position
open	11-12 21-22
closed	11-14 21-24
tripped	11-12 21-22

circuit-breaker	SD switch position
open	91-94
closed	91-94
tripped	91-92

connection



Vigi modules for C60 and C120 circuit-breakers

function

Common function

Adaptable to C60 & C120 circuit-breakers to 125 A - 2, 3, 4P, the Vigi up module ensures:

- the protection of electrical installations against insulation faults
- the protection of persons against indirect contact: medium sensitivities (300, 500mA)
- additional protection of persons against direct contact: high sensitivity (30 mA)

The C60/C120 residual current device complies with standard EN 61009: no heat derating of the circuit-breaker

It is equipped with a locating device that ensures the correct rating and number of poles

The technical data of circuit-breakers that are combined with Vigi modules remain unchanged and the circuit-breakers remain compatible with indication or control auxiliaries

AC class

Vigi module for which tripping is ensured by sinusoidal AC currents whether they are quickly applied or rise slowly

Instantaneous

It ensures instantaneous tripping (not time-delayed)

Selective 

Selective  Vigi modules allow for total vertical discrimination if:

- upstream devices are s or delayed
- downstream devices are instantaneous and their sensitivity is less than IDn/2 of the upstream device.

description

Technical data

- the Vigi module incorporates the residual current relay and toroid in a case. Its earth leakage module is electro-mechanical.
- It functions without an auxiliary power supply source and thus has a very wide operating range
- protected against nuisance tripping due to transient overvoltages (lightning stroke, switchgear switching on the network, etc.)
- breaking and making capacity upon short-circuit is equal to the breaking capacity of the circuit-breaker
- instantaneous or selective s trip units
- reinforced electromagnetic compatibility

- remote tripping: possible using an MX or MN release on circuit-breaker
- connection by tunnel terminals in mod. of 9mm
- fault indication by means of a red strip on the resetting handle
- resetting the Vigi module, at user's convenience:
 - either using the circuit-breaker handle
 - or independently of the circuit-breaker.

- AC class: 50/60Hz
- Minimum operating threshold for test button
 - Vigi C60 : 100VAC
 - Vigi C120 : 176VAC
- AS3190, AS/NZS61009 (IEC61009)
 - Connection by tunnel terminals
 - Vigi C60 : up to 35mm² stranded cables
 - Vigi C120 : up to 50mm² stranded cables
 - Copper or aluminium cables (using aluminium cable terminal).

type	Vigi C60	Vigi C120
2P	4	7
3P	7	10
4P	7	10

combination of earth leakage modules with circuit-breakers



C120 residual current device

=



C120 circuit breaker

+

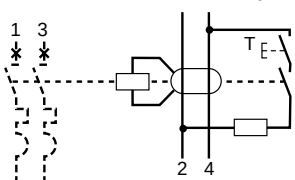
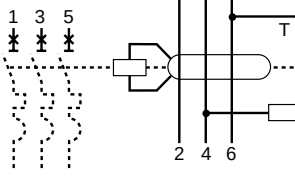
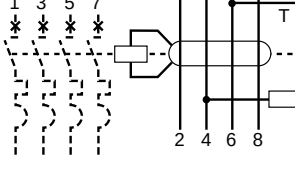


Vigi C120 module

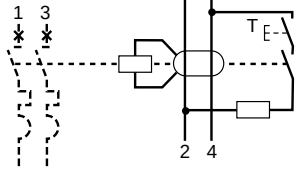
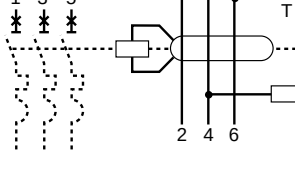
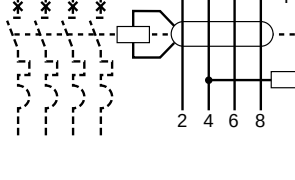
Vigi modules for C60 and C120 circuit-breakers

catalogue numbers



type	voltage (V)	sens. (mA)	catalogue number
Vigi C60 type AC ($\leq 63A$)			
2P 	240...415	30 mA	26658
		300mA	26660
3P 	415	30 mA	26620
		300mA	26682
4P 	415	30 mA	26665
		300mA	26667



type	voltage (V)	sens. (mA)	catalogue number
Vigi C120 type AC ($\leq 125A$)			
2P 	230...415	30	18563
		300	18564
		500	18565
3P 	230...415	30	18566
		300	18567
		500	18568
4P 	230...415	30	18569
		300	18570
		500	18571

accessories

for C60 and C120 circuit-breakers

catalogue numbers



26970



26981



26976



27060

type	suitable for	catalogue number	quantity per box
padlocking facility	C60	26970	2
	C120	27145	4
	C60 circuit-breaker	26981	2
	Vigi C60	26982	10
	C120 circuit-breaker	18527	2
terminal shield	C60	1P	26975
		2P	26976
		3P	26975 + 26976
		4P	26978
terminal shield	C120	1P	18526
		2P	2 x 18526
		3P	3 x 18526
		4P	4 x 18526
insulated sub-terminal		19091	4
aluminium cable terminal		27060	1

accessories

for C60 and C120 circuit breakers

type		catalogue number	quantity per box
screw connection		27053	8
rear connection terminal with 1P terminal shield		18528	2
inter-pole barrier		27001	10
spacer		27062	
marker strips		27062	
label holder C120		27150	10
replacement wire cover C60	2P	26483	5
	3P	26484	5
	4P	26485	5



18528



27062



marker strips



protection

circuit-breakers up to 40A

C32H-DC circuit-breakers

AS3947-2

functions

The C32H-DC circuit-breakers are designed for the protection and control of power circuits used in DC applications (eg; security lighting, automation, telephone systems)

description

technical data common to C32H-DC circuit-breakers

- power circuit
- voltage rating:
single pole: 125V DC
two pole: 250V DC
- current ratings: 1 to 40 A set at 40 °C
- breaking capacity as in AS3947-2, Icu ultimate breaking capacity (O-CO operating cycle)

type	rating (A)	voltage (VDC)	breaking capacity Icu (kA)
1P	1 to 40 A	125	10
2P	1 to 40 A	125	20
		250	10

- tripping curve: type C
the magnetic releases operate between 7 and 10 In.
- number of operating cycles: (O-C) 10,000 at L/R ≤ 0.015 sec
- tropicalisation: treatment 2 (relative humidity 95% at 55°C)
- connection: tunnel terminals for the following cables:
 - 16mm² flexible with cable end
 - 25mm² stranded

■ It is imperative to respect the polarity and function of the power supply.

catalogue numbers

type	rating (A)	catalogue number	width in mod of 9 mm	quantity per box
C32H-DC single pole				
	1	20531	2	12
	2	20532	2	12
	3	20533	2	12
	6	20534	2	12
	10	20535	2	12
	16	20536	2	12
	20	20537	2	12
	25	20538	2	12
	32	20539	2	12
	40	20540	2	12



20536

2P	1	20541	4	6
	2	20542	4	6
	3	20543	4	6
	6	20544	4	6
	10	20545	4	6
	16	20546	4	6
	20	20547	4	6
	25	20548	4	6
	32	20549	4	6
	40	20550	4	6



20550

C32H-DC circuit-breakers for DC applications

selecting the circuit-breaker

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

- the nominal current, which determines the rating of the equipment
- the type of network
- the nominal voltage, which determines the number of poles to be involved in breaking
- the maximum short-circuit current at the point of installation, which determines the breaking capacity

calculation of the short-circuit current (I_{sc}) at the terminal of a battery

When a short-circuit occurs at its terminals, a battery discharges a current given by Ohm's law:

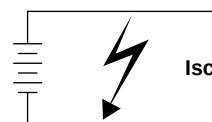
$$I_{sc} = \frac{V_b}{R_i}$$

where V_b = the maximum discharge voltage (battery 100 % charged)
and R_i = the internal resistance equivalent to the sum of the cell resistances
(figure generally given by the manufacturer in terms of Ampere-hour capacity of the battery).

example

What is the short-circuit current at the terminals of standing battery with the following characteristics:

- capacity: 500 Ah
- maximum discharge voltage: 240 V (110 cells of 2.2 V)
- discharge current: 300 A
- internal resistance: 0.5 mΩ per cell



$$R_i = 110 \times 0.5 \times 10^{-3}$$

$$I_{sc} = \frac{240}{55 \times 10^{-3}} = 4.4 \text{ kA}$$

As the above calculation shows, the short-circuit current is relatively weak.

Note: if the internal resistance is not known, the following approximate formula can be used:
 $I_{sc} = kC$, where C is capacity of the battery expressed in Ampere-hours, and k is a coefficient close to 10 but in any case always lower than 20.

C32H-DC circuit-breakers for DC applications

recommendations for use

The C32H-DC special DC circuit-breaker is designed for the control and protection of circuits up to 250 V DC with $I_{sc} \leq 20$ kA. For higher voltages or short-circuit currents, refer to the previous pages.

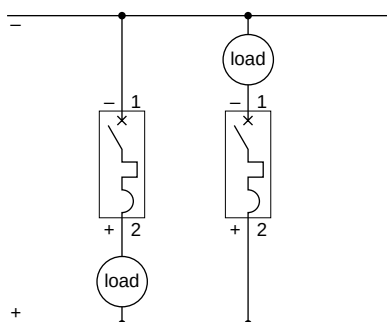
connection diagram

The circuit-breaker connection diagram to be used depends on the service voltage, the I_{sc} of the installation and the position of the load:

C32H-DC 1 pole

■ service voltage ≤ 125 V DC

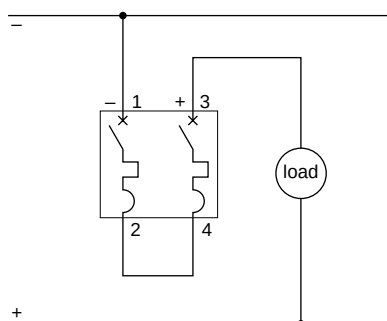
■ $I_{sc} \leq 10$ kA



C32H-DC 2 poles

■ service voltage ≤ 125 V DC

■ $I_{sc} \leq 20$ kA



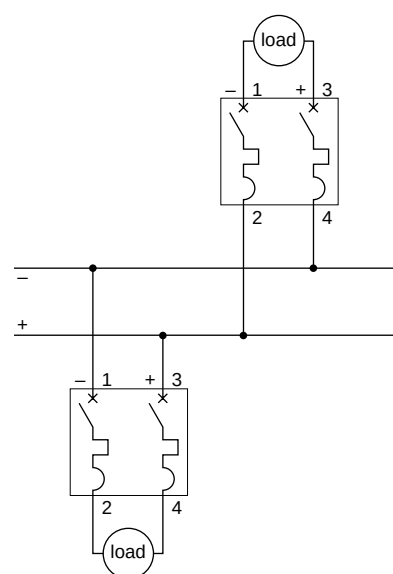
Note :

The C32H-DC is a polarized circuit-breaker, equipped with a permanent magnet for satisfactory breaking of the rated current. In accordance with the diagram to be used, always respect the + and - polarities indicated on the circuit-breaker.

C32H-DC 2 poles

■ service voltage ≤ 250 V DC

■ $I_{sc} \leq 10$ kA



Tm motor mechanism for C60N/H and C120N/H circuit breakers

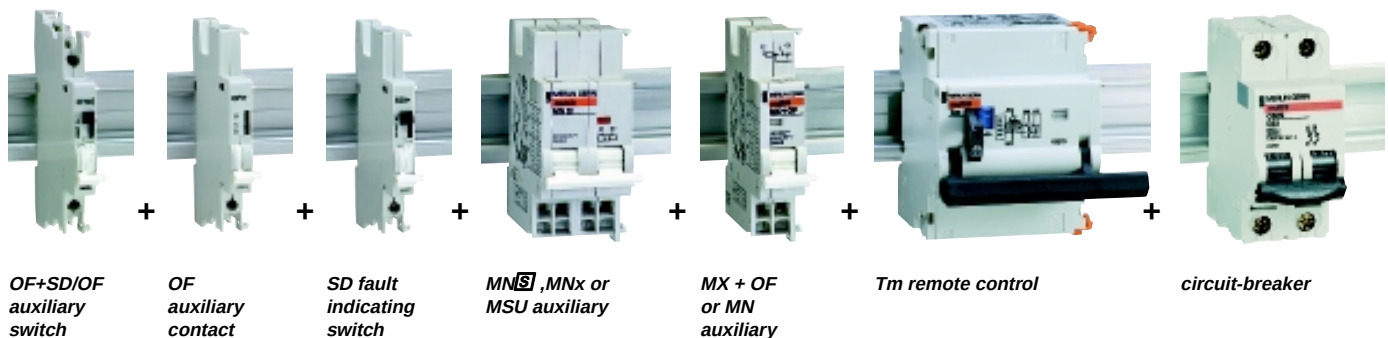
function

Tm motor mechanism is used for:

- the remote control of C60/C120 circuit-breakers (with or without a Vigi module) via a latched order,
- circuit-breaker resetting after tripping.

Local control using the operating handle continues to be possible, as is adaptation of other circuit-breaker auxiliaries.

description



- Tm modules are controlled by an electrical latched type order.

- a disconnection selector switch placed on the front panel is used to:
 - neutralise the remote control
 - lock the remote controlled circuit-breaker in the "open" position (7 mm Ø padlock not supplied).

- a mechanical indicator shows the "open" or "closed" status of the Tm remote control.

- reclosing after a fault:
 - must be carried out in manual mode, locally after search and clearance of the fault
 - to impose manual and local resetting, an SD auxiliary switch (ref. 26927), cabled in series in the Tm module, prevents automatic and remote reclosing
 - remote reclosing is possible provided regulations are complied with: resetting takes place by opening the control circuit for more than 1.5 s.

- auxiliaries in the C60/C120 range, adaptable to circuit-breakers using clips (without tools),
 - instantaneous or delayed undervoltage tripping: MN and MNx
 - instantaneous shunt tripping: MX+OF
 - fault trip indication: SD
 - indication of the circuit-breaker's "open" or "closed" position: OF.
 - other possible control modes:
 - control by an impulse and/or latched order: ACTc
 - time-delayed: ACTt
 - by BatiBUS network: ATB1s.

technical data

- control voltage (Uc): 230 V AC (-15 % +10 %)

- frequency: 50...60 Hz

- consumption:
 - inrush:
 - TmC60: 28 VA
 - TmC120: 35 VA
 - holding: 2 VA

- insensitive to brownouts: ≤ 0.45 s

- undervoltage behaviour:
 - > 0.45 s, mechanical opening of poles
 - reclosing 2 s after power is restored.

- number of cycles (O-C) at 40 °C:
 - Tm + C60: 20 000
 - Tm + C120 (≤ 63 A): 10 000
 - Tm + C120 (80...125 A): 5 000.

- opening time by Tm: 0.5 s

- closing time by Tm: 2 s

connection

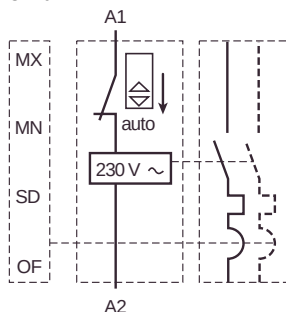
- using tunnel terminals:
 - 1 x 6 mm² cable
 - 2 x 1.5 mm² or 2.5 mm² cables.

weight

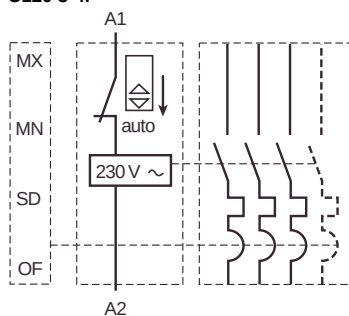
- 1-2P: 300 g
- 3-4P: 310 g.

type	voltage (v AC)	catalogue number	width in mod. of 9 mm	quantity per box
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18310	7
18312	7

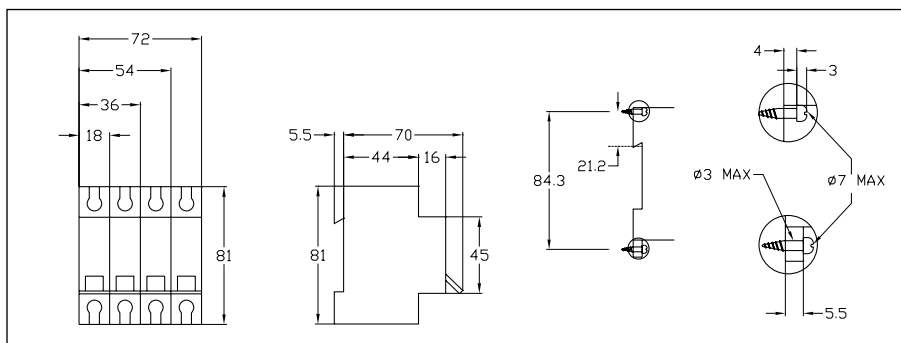


18311	7
18313	7

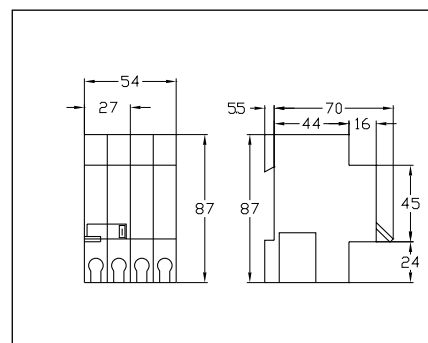


Dimensions

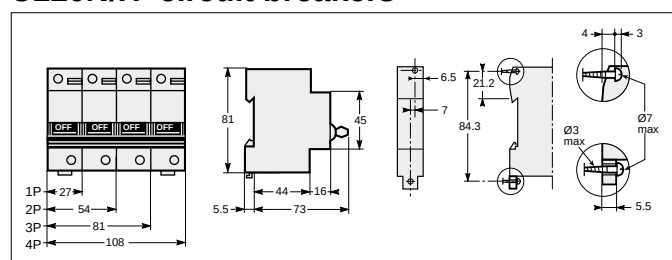
C60a/N/H circuit breakers



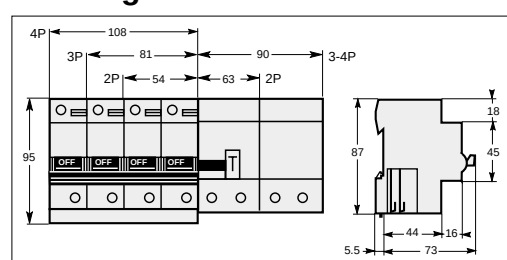
Vigi C60



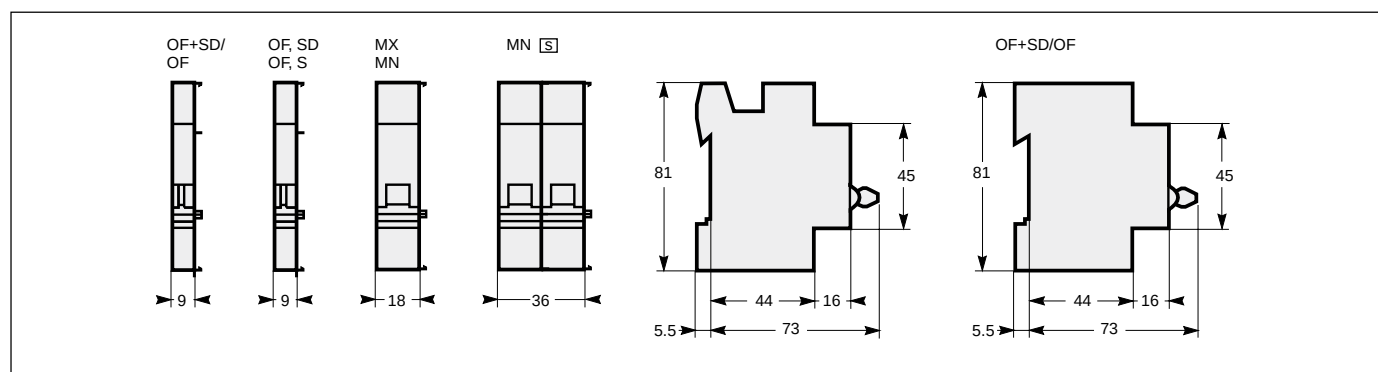
C120N/H circuit breakers



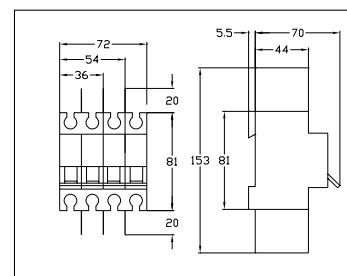
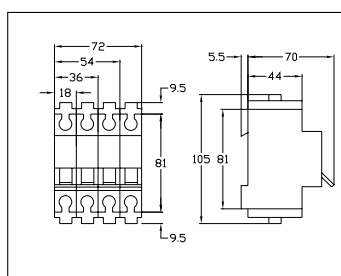
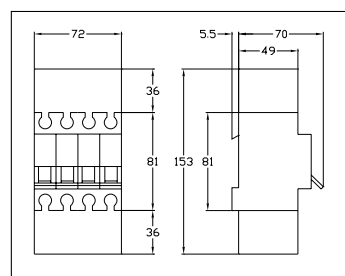
Vigi C120



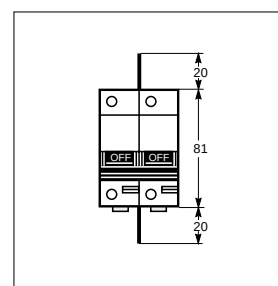
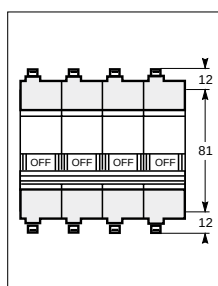
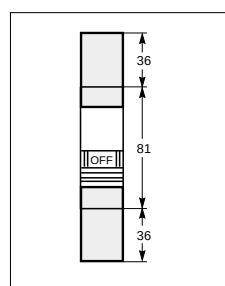
C60/C120 auxiliaries



C60 accessories

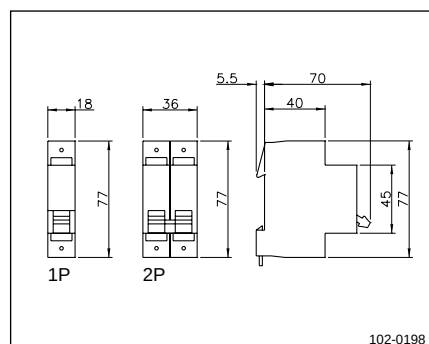


C120 accessories

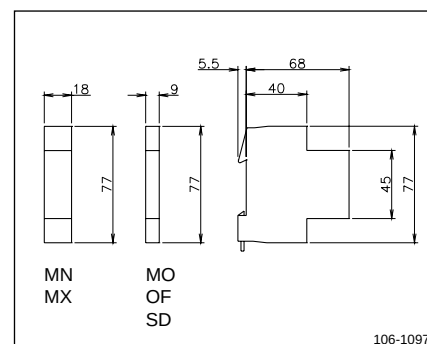


Dimensions

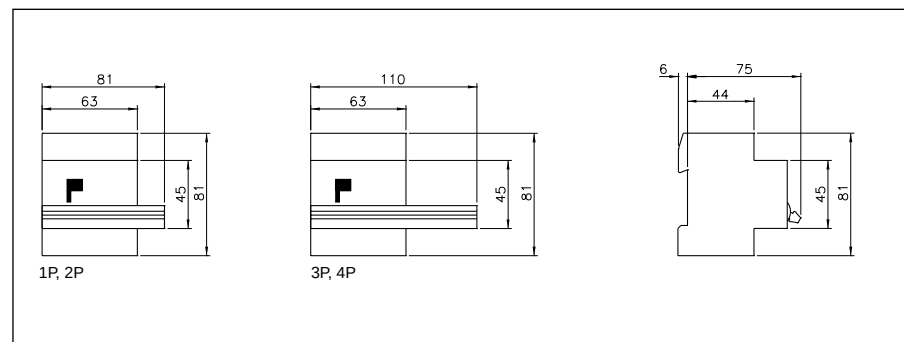
C32H-DC circuit breakers



C32H-DC auxiliaries



Tm C60/C120



Locations

Head Office:

2 Solent Circuit, Norwest Business Park, Baulkham Hills NSW 2153 Tel: (02) 9851 2800

Sales Offices:

NSW

2 Solent Circuit, Norwest Business Park, Baulkham Hills NSW 2153 Tel: (02)9851 2800 Fax: (02) 9629 8555

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77 Ricketts Road, Mt Waverley VIC 3149 Tel: (03) 9558 9876 Fax: (03) 9558 9701

SA

Building 1A, Corbett Court, Export Park, Adelaide Airport SA 5950 Tel: (08) 8234 4388 Fax: (08) 8234 4122

WA

26 Gibberd Road, Balcatta WA 6021 Tel: (08) 9344 2727 Fax: (08) 9344 6335

QLD

30 Graystone Street, Tingalpa QLD 4173 Tel: (07) 3890 2112 Fax: (07) 3890 2098

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Manufacturing Facilities

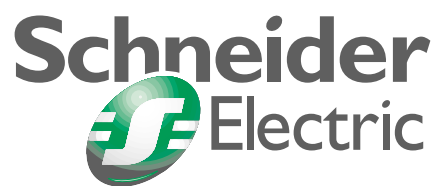
MV Transformers & Substations

Sydney Road, Benalla VIC Tel: (03) 5762 3411 Fax: (03) 5762 5113

MV Switchgear

77 Ricketts Road, Mt Waverley VIC Tel: (03) 9558 9876 Fax: (03) 9558 9600





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Publishing: Schneider Electric
Design, production: The Graphic Shop
Photos: Schneider Electric
Printing: TBA