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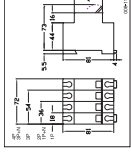
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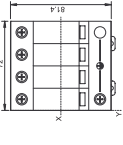
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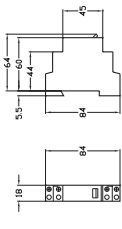
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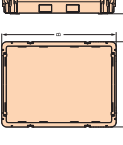
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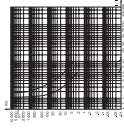
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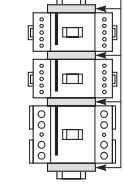
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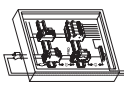
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Multipolar Protection

A Multipolar Protection

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Multipolar Protection

Circuit protection breakers

Overview of the modular offer

Several criteria are used when choosing a circuit-breaker

- Use:
 - IEC 60898 (EN 60898) switchboard accessible by non-experts
 - IEC 60947, in all other installations (tertiary, agricultural, industrial), operated by qualified personnel.
- Network data for the point in question:
 - earthing systems (TT, TN, IT)
 - short-circuit current at the point where the circuit-breaker is implanted, which must always be less than the device's breaking capacity
 - normal network voltage.
- Data for the circuit to be protected:
 - the circuit-breaker's tripping curve:
 - the C curve: standard
 - the B curve: when dealing with a generator that can only provide a weak short-circuit current
 - the D curve: when the start-up current is considerable
 - the number of poles required by the loads.

Earth leakage protection is determined in function of the desired level of

- Protection against direct contact (break or absence of protective conductor): 30 mA (or 10 mA).
- Protection against fire: 300 mA (or 500 mA).
- Protection against indirect contact: 500 mA, 1 A, 3 A or more.
- Reference standard: corresponding to that of the circuit-breaker:
 - IEC/EN 61009: installations accessible by non specialists
 - IEC 60947-2: industrial standards.

Circuit-breakers (IEC 60947-2)

Particularity	Tripping curves					Ratings (A)	Voltage Ue (V)	Number of poles	Breaking capacity with 400 V (kA)										
	B	C	D/K	Z	MA				3	4.5	5	6	7.5	10	15	20	25	36	50
C60a	■	■				2...40 440		1, 2, 3, 4											
C60N	■	■	■			0,5...63 440		1, 2, 3, 4											
C60H	■	■	■			0,5...63 440		1, 2, 3, 4											
C60L	■	■	■	■		0,5...25 440		1, 2, 3, 4											
	■	■	■	■		32/40 440		1, 2, 3, 4											
	■	■	■			50/63 440		1, 2, 3, 4											
C60LMA Motor					■	1,6...25 440		2, 3											
					■	40 440		2, 3											
C120N	■	■	■			63...125 440		1, 2, 3, 4											
C120H	■	■	■			10...125 440		1, 2, 3, 4											
NG125N		■	■			10...125 500		1, 2, 3, 4											
NG125H		■				10...80 500		1, 2, 3, 4											
NG125L		■	■			10...80 500		1, 2, 3, 4											
NG125LMA Motor					■	4...80 500		2, 3											
P25M Motor					■	0,16...25 690		3											
C32H-DC Direct current		■				1...40 125 V DC		1											
						250 V DC		2											

Residual current circuit-breakers and Vigi modules (IEC 60947-2)

Basic circuit-breaker	Residual current circuit-breaker		Sensitivity																
	Built-in	Combined	Instantaneous							Selective 			Adjustable I/S*				Adjustable I/S/R*		
			10 mA	30 mA	100 mA	300 mA	500 mA	1 A	300 mA	500 mA	1 A	300 mA	500 mA	1 A	3 A	300 mA	500 mA	1 A	3 A
C60a		Vigi C60 AC	■	■	■	■	■	■											
C60N		Vigi C60 A		■	■	■	■		■		■								
C60H		Vigi C60 A si		■					■		■								
C60L		Vigi C60 A SiE		■					■		■								
C60LMA																			
C120N		Vigi C120 AC		■		■	■		■		■								
C120H		Vigi C120 A		■		■	■		■	■	■								
		Vigi C120 A si		■		■	■		■		■								
		Vigi C120 A SiE		■		■	■		■		■								
NG125N		Vigi NG125		■	■	■			■		■	■	■	■	■	■	■	■	■
NG125H																			
NG125L																			
NG125LMA																			

*I/S: instantaneous or selective

I/S/R: instantaneous, selective or delayed (150 ms).

Multipolar Protection

Circuit protection breakers

Overview of the modular offer

Circuit-breakers (IEC/EN 60898)

Particularity	Tripping curves				Ratings (A)	Number of poles	Breaking capacity with 400 V (kA)										
	B	C	D/K	Z	Voltage U _e (V)		3	4.5	5	6	7.5	10	15	20	25	36	50
C60a	■	■			2...40 440	1, 2, 3, 4	■										
C60N	■	■	■		0.5...63 440	1, 2, 3, 4	■	■	■	■	■						
C60H	■	■	■		0.5...63 440	1, 2, 3, 4	■	■	■	■	■	■					
C120N	■	■	■		63...125 440	1, 2, 3, 4	■	■	■	■	■	■					
C120H	■	■	■		10...125 440	1, 2, 3, 4	■	■	■	■	■	■	■				

Circuit-breakers and Vigi modules (IEC/EN 61009)

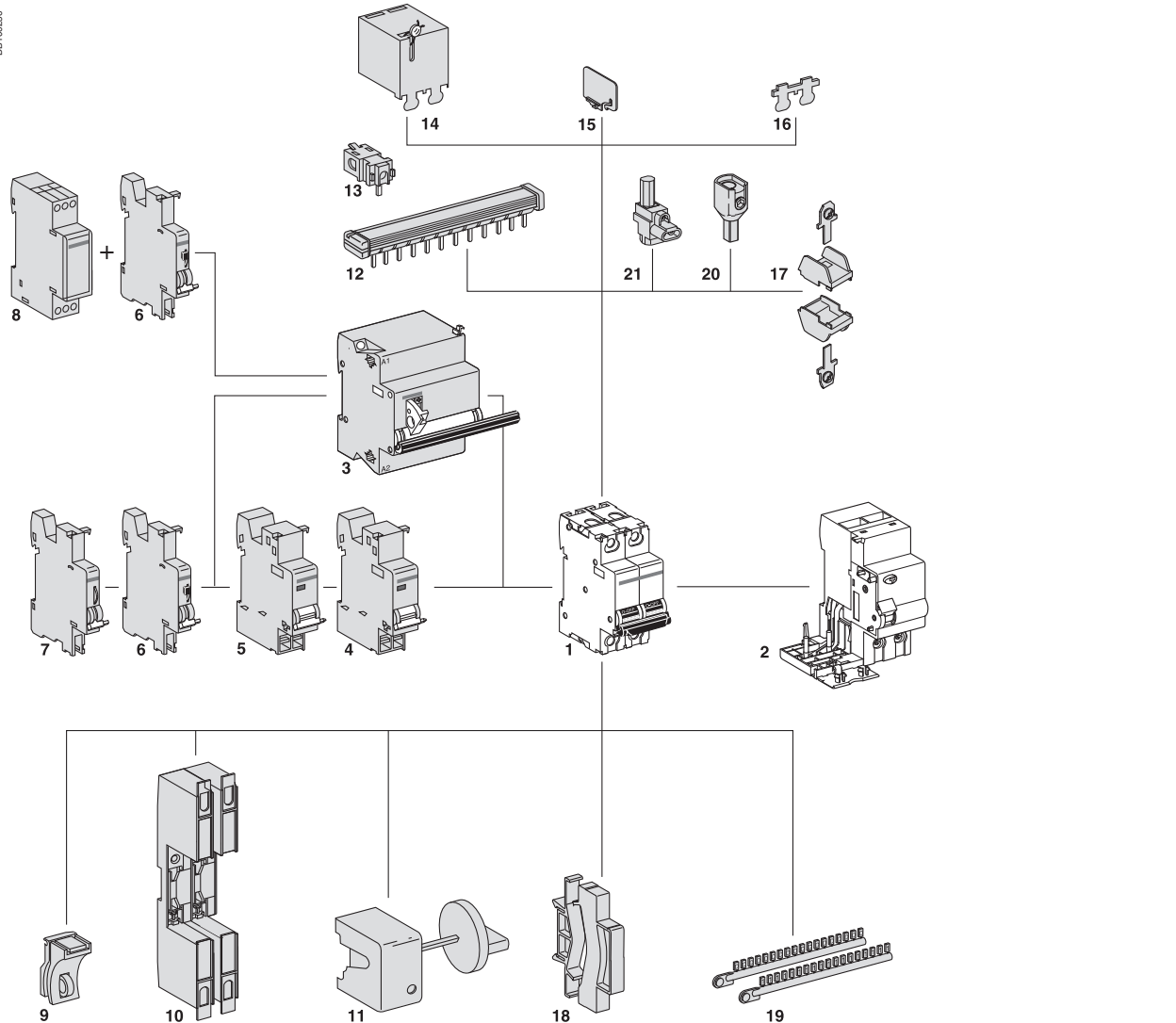
Basic circuit-breaker	Residual current circuit-breaker		Sensitivity Instantaneous							Selective S			Adjustable I/S*			Adjustable I/S/R*			
	Built-in	Combined	10 mA	30 mA	100 mA	300 mA	500 mA	1A	300 mA	500 mA	1A	300 mA	500 mA	1A	3A	300 mA	500 mA	1A	3A
C60a C60N C60H		Vigi C60 AC Vigi C60 A Vigi C60 A si Vigi C60 A SiE	■	■	■	■	■	■	■		■								
C120N C120H		Vigi C120 AC Vigi C120 A Vigi C120 A si Vigi C120 A SiE		■		■	■		■	■	■								

Residual current circuit breakers (IEC 61008)

Residual current circuit breakers		Ratings (A)	Number of poles	Sensitivity (mA) instantaneous					Selective S		
		Voltage U _e (V)		10 mA	30 mA	100 mA	300 mA	500 mA	100 mA	300 mA	500 mA
ID/RCCB	AC	25...100 230/400	2, 4	■	■	■	■	■		■	■
	A	16...100 230/400	2, 4	■	■	■	■	■	■	■	■
	A si	25...80 230/400	2, 4		■					■	
	A SiE	25...63 230/400	2, 4		■					■	
RCCB-ID	AC	100...125 230/400	2, 4		■	■	■	■			
	A	80...125 230/400	2, 4		■		■	■		■	
	A si	100...125 230/400	2, 4		■		■				
RCCB-ID	B	25...125 230/400	4		■		■	■		■	

C60/C120 circuit-breakers - C60/C120 Vigi residual current devices

DB118226



1- circuit-breaker

Auxiliaries

- 2- Vigi earth leakage module
- 3- Tm or TmC120 (2P) remote control
- 4- MN undervoltage release or MN_S time-delayed undervoltage release or MNx shunt release for emergency stopping
- 5- MX, MX+OF voltage shunt release or MSU voltage threshold release
- 6- SD fault indicating auxiliary switch
- 7- OF or OF+SD/OF auxiliary switch
- 8- ATm, ATm3 or ATm7 automated device for reclosing after fault of the protection (cable connection); the SD auxiliary is compulsory.

Accessories

- 9- padlocking facility
- 10- dividable mounting plate
- 11- rotary handle
- 12- comb busbar
- 13- insulated connector
- 14- sealable terminal shield
- 15- inter-pole barrier
- 16- screw shield
- 17- ring tongue terminal connections kit (C60 only)
- 18- spacer
- 19- clip-on markers
- 20- terminal 50 mm² Cu / Al
- 21- insulated distribution terminal

Multipolar Protection

Circuit protection

breakers

C60 circuit-breaker choice tables

Type	C60a	C60N	C60H	C60L	C60L	C60L
Current rating (A)	2...40	0,5...63	0,5...63	0,5...25	32/40	50/63
Maximum voltage rating Ue (V)	AC 440					
	DC 60 V/pole					
Min. voltage rating Ue min (V AC-DC)	12					
Insulation voltage Ui (V)	500					
Impulse voltage Uimp (kV)	6					
Number of poles	1 2, 3, 4	1 2, 3, 4	1 2, 3, 4	1 2, 3, 4	1 2, 3, 4	1 2, 3, 4
Breaking capacity AC						
EN 60898 Icn 230/400 V	3000 3000	6000 6000	10000 10000			
(A) Ics 230/400 V	3000 3000	6000 6000	7500 7500			
IEC 60947-2 Icu 130 V	10	20	30	50	50	50
(kA) 230...240 V	5 10	10 20	15 30	25 50	20 40	15 30
400...415 V	3 5	3 10	4 15	6 25	5 20	4 15
440 V	3 3	6 6	10 10	20 20	15 15	10 10
Ics	75 % Icu	75 % Icu	50 % Icu	50 % Icu	50 % Icu	50% Icu
Breaking capacity DC						
IEC 60947-2 Icu 60 V (1P)	10	15	20	25	25	25
(kA) ⁽²⁾ 125 V (2P)	10	20	25	30	30	30
125 V (3P)	20	30	40	50	50	50
250 V (4P)	25	40	50	60	60	60
Fast closing	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Isolation with positive break indication	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Adaptable Vigi module	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Auxiliaries OF, SD, OF+SD/OF	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
MSU, MN, MN[S], MX-OF, MNx	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Tm	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Connection Screwdriver Ø (mm)	6.5 mm maximum blade (POSIDRIV No. 2)					
Tightening torque (N.m)	≤ 25 A : 2					
	≤ 63 A : 3.5					
Inlet dimension (mm)	H x L	Ø				
≤ 25 A	8 x 6.9	(6.9)				
≤ 63 A	8 x 8	(8.7)				
Utilisation temperature	-25°C to +60°C					
Storage temperature	-40°C to +70°C					
Insulating material	Self-extinguishing 960°C					

⁽²⁾ the number of poles participating in breaking is given between brackets

Type	C60a	C60N	C60H	C60L
Thermal magnetic trip units	Not interchangeable and not adjustable			
Magnetic Im Curve	B C	B C D	B C D	B C D/K Z MA
Thermal In (A)	0.5	■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
Setting current at 30°C	0.75		■	
	1	■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	1.6			■ ■ ■ ■ ■
	2	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	2.5			
	3	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	4	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	6	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	6.3			
	10	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	12.5			
	13	■ ■ ■	■ ■ ■	
	15	■ ■ ■		
	16	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	20	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	25	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	32	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	40	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	50	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■
	63	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■ ■



23794



23816



23829



23842

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 with TN and IT earthing systems
- C60a circuit-breakers are used in the tertiary and industrial sectors.

Tripping curves

B curve

When the short-circuit currents are weak (generators, long cables).

- Power circuit:
 - ratings: 6 to 40 A set at 30 °C
 - tripping curve: the magnetic trip units operate between 3 and 5 In.

C curve

Cables feeding conventional loads.

- Power circuit:
 - ratings: 2 to 40 A set at 30 °C
 - tripping curve: the magnetic trip units operate between 5 and 10 In.

Technical according to IEC 60898

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - breaking capacity:
 - according to IEC 60898, Icn ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icn (kA)
2...40	1P	230/240	3
	2P, 3P, 4P	400	3

- limitation class (IEC 60898): 3.

Technical data according to IEC 60947-2

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - impulse voltage (Uimp): 6 kV
 - insulation voltage (Ui): 500 V AC
 - breaking capacity:
 - according to IEC 60947-2, Icu ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icu (kA)
2...40	1P	130	10
		230...240	5
		400...415	3 (1)
	2P, 3P, 4P	230...240	10
		400...415	5

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

General technical data

- Fast closing: allows the high inrush currents of some loads to be better held.
- Isolation with positive break indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening contacts of all the poles.
- Number of cycles (O-C): 20 000.
- Environment
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C) according to IEC 60068-1
 - weight (g):

Type	1P	2P	3P	4P
	120	240	360	480

- Connection: tunnel terminals for the following cables:
 - 16 mm² flexible or 25 mm² rigid up to 25 A ratings
 - 25 mm² flexible or 35 mm² rigid for 32 to 40 A ratings.

Multipolar Protection

Circuit protection

breakers

C60a circuit-breaker

B and C curves

IEC 60898: **3000 A**, IEC 60947-2: 5 kA

Catalogue numbers

Type	Rating (A)	Width in mod. of 9 mm	Quantity per batch	Catalogue number	
				B curve	C curve
1P	2	2	12	-	23794
	4	2	12	-	23796
	6	2	12	25225	23797
	10	2	12	25226	23798
	16	2	12	25227	23799
	20	2	12	25228	23800
	25	2	12	25229	23801
	32	2	12	25230	23802
	40	2	12	25231	23803
2P	2	4	6	-	23807
	4	4	6	-	23809
	6	4	6	25233	23810
	10	4	6	25234	23811
	16	4	6	25235	23812
	20	4	6	25236	23813
	25	4	6	25237	23814
	32	4	6	25238	23815
	40	4	6	25239	23816
3P	2	6	4	-	23820
	4	6	4	-	23822
	6	6	4	25241	23823
	10	6	4	25242	23824
	16	6	4	25243	23825
	20	6	4	25244	23826
	25	6	4	25245	23827
	32	6	4	25246	23828
	40	6	4	25247	23829
4P	2	8	3	-	23833
	4	8	3	-	23835
	6	8	3	25249	23836
	10	8	3	25252	23837
	16	8	3	25253	23838
	20	8	3	25254	23839
	25	8	3	25255	23840
	32	8	3	25256	23841
	40	8	3	25257	23842

PB100214



23794

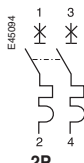


1P

PB100215



23816

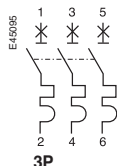


2P

PB100216



23829

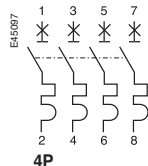


3P

PB100217



23842



4P

Multipolar Protection Circuit protection breakers

C60N circuit-breaker B, C and D curves IEC 60898: 6000 A, IEC 60947-2: 10 kA

A

I

PB100218



24067

PB100219



24335

PB100221



24080

PB100222



24694

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 with TN and IT neutral systems.
- C60N circuit-breakers are used in the tertiary and industrial sectors.

Tripping curves

B curve

When the short-circuit currents are weak (generators, long cables).

- Power circuit
 - ratings: 4 to 63 A set at 30°C
 - tripping curve: the magnetic trip units operate between 3 and 5 In.

C curve

Cables feeding conventional loads.

- Power circuit
 - ratings: 0.5 to 63 A set at 30°C
 - tripping curve: the magnetic trip units operate between 5 and 10 In.

D curve

Loads with high inrush currents (motors, transformers).

- Power circuit
 - ratings: 0.5 to 63 A set at 40°C
 - tripping curve: the magnetic trip units operate between 10 and 14 In.

Technical data according to IEC 60898

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - breaking capacity:
 - according to IEC 60898, Icn ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icn (A)
0.5...63	1P	230/400	6000
	2P, 3P, 4P	400	6000

- limitation class (IEC 60898): 3.

Technical data according to IEC 60947-2

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - impulse voltage (Uimp): 6 kV
 - insulation voltage (Ui): 500 V AC
 - breaking capacity:
 - according to IEC 60947-2, Icu ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icu (kA)
0.5...63	1P	230...240	10
		400...415	3 (1)
	2P, 3P, 4P	230...240	20
	2P, 3P, 4P	400...415	10

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

General technical data

- Fast closing: allows the high inrush currents of some loads to be better held.
- Isolation with positive break indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening contacts of all the poles.
- Number of cycles (O-C): 20 000.
- Environment:
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C) according to IEC 60068-1
 - weight (g):

Type	1P	2P	3P	4P
	120	240	360	480

- Connection: tunnel terminals for the following cables:
 - 16 mm² flexible or 25 mm² rigid up to 25 A ratings
 - 25 mm² flexible or 35 mm² rigid for 32 to 63 A ratings.

Multipolar Protection

Circuit protection

breakers

C60N circuit-breaker

B, C and D curves

IEC 60898: **6000 A**,

IEC 60947-2: 10 kA

Catalogue numbers



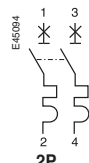
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1P



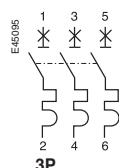
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2P



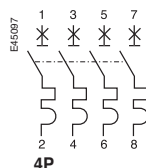
24080



3P



24694



4P

Type	Rating (A)	Width in mod. of 9 mm	Quantity per batch	Catalogue number		
				B curve	C curve	D curve
1P	0.5	2	12	-	24067	24493
	1	2	12	24045	24395	24625
	2	2	12	24046	24396	24626
	3	2	12	24047	24397	24627
	4	2	12	24048	24398	24628
	6	2	12	24049	24399	24629
	10	2	12	24050	24401	24630
	16	2	12	24051	24403	24632
	20	2	12	24052	24404	24633
	25	2	12	24053	24405	24634
	32	2	12	24054	24406	24635
	40	2	12	24055	24407	24636
	50	2	12	24056	24408	24637
	63	2	12	24057	24409	24638
2P	0.5	4	6	-	24068	24494
	1	4	6	24071	24331	24653
	2	4	6	24072	24332	24654
	3	4	6	24073	24333	24655
	4	4	6	24074	24334	24656
	6	4	6	24075	24335	24657
	10	4	6	24076	24336	24658
	16	4	6	24077	24337	24660
	20	4	6	24078	24338	24661
	25	4	6	24079	24339	24662
	32	4	6	24080	24340	24663
	40	4	6	24081	24341	24664
	50	4	6	24082	24342	24665
	63	4	6	24083	24343	24666
3P	0.5	6	4	-	24069	24495
	1	6	4	24084	24344	24667
	2	6	4	24085	24345	24668
	3	6	4	24086	24346	24669
	4	6	4	24087	24347	24670
	6	6	4	24088	24348	24671
	10	6	4	24089	24349	24672
	16	6	4	24090	24350	24674
	20	6	4	24091	24351	24675
	25	6	4	24092	24352	24676
	32	6	4	24093	24353	24677
	40	6	4	24094	24354	24678
	50	6	4	24095	24355	24679
	63	6	4	24096	24356	24680
4P	0.5	8	3	-	24070	24496
	1	8	3	24097	24357	24681
	2	8	3	24098	24358	24682
	3	8	3	24099	24359	24683
	4	8	3	24100	24360	24684
	6	8	3	24101	24361	24685
	10	8	3	24102	24362	24686
	16	8	3	24103	24363	24688
	20	8	3	24104	24364	24689
	25	8	3	24105	24365	24690
	32	8	3	24106	24366	24691
	40	8	3	24107	24367	24692
	50	8	3	24108	24368	24693
	63	8	3	24109	24369	24694

additional
information

discrimination table: p. F23-F49
power loss: page F18
derating: page F15-F16

cascading: page F19 to F22
electrical auxiliaries: p. A81 to A84
Vigi module: page A18

accessories: page A85-A86
dimensions: page A108
tripping curves: page F2-F3

Multipolar Protection Circuit protection breakers

C60H circuit-breaker B, C and D curves IEC 60898: 10000 A, IEC 60947-2: 15 kA

A

I

PB100503



25159

PB100277



24988

PB100275



25002

PB100272



24756

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 with TN and IT neutral systems.
- C60H circuit-breakers are used in the tertiary and industrial sectors.

Tripping curves

B curve

When the short-circuit currents are weak (generators, long cables).

- Power circuit
 - ratings: 6 to 63 A set at 30°C
 - tripping curve: the magnetic trip units operate between 3 and 5 In.

C curve

Cables feeding conventional loads.

- Power circuit
 - ratings: 0.5 to 63 A set at 30°C
 - tripping curve: the magnetic trip units operate between 5 and 10 In.

D curve

Loads with high inrush currents (motors, transformers).

- Power circuit
 - ratings: 0.5 to 63 A set at 40°C
 - tripping curve: the magnetic trip units operate between 10 and 14 In.

Technical data according to IEC 60898

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - breaking capacity:
 - according to IEC 60898, Icn ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icn (A)
0.5...63	1P	230/400	10000
	2P, 3P, 4P	400	10000

- limitation class (IEC 60898): 3.

Technical data according to IEC 60947-2

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - impulse voltage (Uimp): 6 kV
 - insulation voltage (Ui): 500 V AC
 - breaking capacity:
 - according to IEC 60947-2, Icu ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icu (A)
0.5...63	1P	130	30
		230...240	15
		400...415	4 (1)
	2P, 3P, 4P	230...240	30
		400...415	15
		440	10

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

General technical data

- Fast closing: allows the high inrush currents of some loads to be better held.
- Isolation with positive break indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening contacts of all the poles.
- Number of cycles (O-C): 20 000.
- Environment:
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C) according to IEC 60068-1
 - weight (g):

Type	1P	2P	3P	4P
	120	240	360	480

- Connection: tunnel terminals for the following cables:
 - 16 mm² flexible or 25 mm² rigid up to 25 A ratings
 - 25 mm² flexible or 35 mm² rigid for 32 to 63 A ratings.

Multipolar Protection

Circuit protection

breakers

C60H circuit-breaker

B, C and D curves

IEC 60898: 10000 A,

IEC 60947-2: 15 kA

Catalogue numbers

Type	Rating (A)	Width in mod. of 9 mm	Quantity per batch	Catalogue number		
				B curve	C curve	D curve
1P	0.5	2	12	-	24900	25171
	0.75	2	12	-	24901	-
	1	2	12	-	24968	25152
	2	2	12	-	24969	25155
	3	2	12	-	24970	25157
	4	2	12	-	24971	25158
	6	2	12	24643	24972	25159
	10	2	12	24644	24973	26160
	16	2	12	24646	24974	25161
	20	2	12	24647	24975	25164
	25	2	12	24648	24976	25165
	32	2	12	24649	24977	25166
	40	2	12	24650	24978	25167
	50	2	12	24651	24979	25168
	63	2	12	24652	24980	25169
2P	0.5	4	6	-	24902	25172
	0.75	4	6	-	24903	-
	1	4	6	-	24981	25183
	2	4	6	-	24982	25184
	3	4	6	-	24983	25185
	4	4	6	-	24984	25186
	6	4	6	24725	24985	25187
	10	4	6	24726	24986	25188
	16	4	6	24727	24987	25189
	20	4	6	24728	24988	25190
	25	4	6	24729	24989	25191
	32	4	6	24730	24990	25192
	40	4	6	24731	24991	25193
	50	4	6	24732	24992	25194
	63	4	6	24733	24993	25195
3P	0.5	6	4	-	24906	25173
	0.75	6	4	-	24907	-
	1	6	4	-	24994	25196
	2	6	4	-	24995	25197
	3	6	4	-	24996	25198
	4	6	4	-	24997	25199
	6	6	4	24738	24998	25200
	10	6	4	24739	24999	25201
	16	6	4	24740	25000	25202
	20	6	4	24741	25001	25203
	25	6	4	24742	25002	25205
	32	6	4	24743	25003	25207
	40	6	4	24744	25004	25208
	50	6	4	24745	25005	25209
	63	6	4	24746	25006	25210
4P	0.5	8	3	-	24908	25174
	0.75	8	3	-	24909	-
	1	8	3	-	25007	25211
	2	8	3	-	25008	25212
	3	8	3	-	25009	25213
	4	8	3	-	25010	25214
	6	8	3	24751	25011	25215
	10	8	3	24752	25012	25216
	16	8	3	24753	25013	25217
	20	8	3	24754	25014	25218
	25	8	3	24755	25015	25219
	32	8	3	24756	25016	25220
	40	8	3	24757	25017	25221
	50	8	3	24758	25018	25222
	63	8	3	24759	25019	25223

PB100503



25159



1P

PB100277



24988

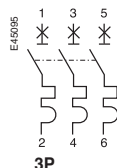


2P

PB100275



25002

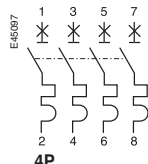


3P

PB100272



24756



4P

additional information

discrimination table: p. F23-F49
power loss: page F18
derating: page F15-F16

cascading: page F19 to F22
electrical auxiliaries: p. A81 to A84
Vigi module: page A18

accessories: page A85-A86
dimensions: page A108
tripping curves: page F2-F3

Multipolar Protection Circuit protection breakers

C60L circuit-breaker

B, C, K and Z curves

IEC 60947-2: 25 kA (≤ 25 A),
20 kA (32-40 A), 15 kA (50-63 A)

A

I



25399



25426



25439



25452

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 with TN and IT neutral systems.
- C60L circuit-breakers are used in the tertiary and industrial sectors.

Tripping curves

B curve

When the short-circuit currents are weak (generators, long cables).

- Power circuit:
 - ratings: 6 to 63 A set at 40°C
 - tripping curve: the magnetic trip units operate between 3.2 and 4.8 In.

C curve

Cables feeding conventional loads.

- Power circuit:
 - ratings: 0.5 to 63 A set at 40°C
 - tripping curve: the magnetic trip units operate between 7 and 10 In.

K curve

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

- Power circuit:
 - ratings: 1 to 63 A set at 40°C
 - tripping curve: the magnetic trip units operate between 10 and 14 In.

Z curve

Protection of electronic circuits.

- Power circuit:
 - rating: 1 to 40 A set at 40°C
 - tripping curve: the magnetic trip units operate between 2.4 and 3.6 In.

Technical data according to IEC 60947-2

- Power circuit:
 - voltage rating (Ue): 440 V AC
 - impulse voltage (Uimp): 6 kV
 - insulation voltage (Ui): 500 V AC
 - breaking capacity:
 - according to IEC 60947-2, Icu ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	breaking capacity Icn (A)
0.5...25	1P	230...240	25
		400...415	6 ⁽¹⁾
	2P, 3P, 4P	230...240	50
		400...415	25
32...40	1P	440	20
		230...240	20
	2P, 3P, 4P	400...415	5 ⁽¹⁾
		230...240	40
50...63	1P	400...415	20
		440	15
	2P, 3P, 4P	230...240	15
		400...415	30
		440	10

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

General technical data

- Fast closing: allows the high inrush currents of some loads to be better held.
- Isolation with positive break indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening contacts of all the poles.
- Number of cycles (O-C): 20 000.
- Environment:
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C) according to IEC 60068-1
 - weight (g):

Type	1P	2P	3P	4P
	120	240	360	480

- Connection: tunnel terminals for the following cables:
 - 16 mm² flexible or 25 mm² rigid up to 25 A ratings
 - 25 mm² flexible or 35 mm² rigid for 32 to 63 A ratings.

Multipolar Protection

Circuit protection breakers

C60L circuit-breaker

B, C, K and Z curves

IEC 60947-2: 25 kA (≤ 25 A),
20 kA (32-40 A), 15 kA (50-63 A)

Catalogue numbers

Type	Rating (A)	Width in mod.	Catalogue number			
			B curve	C curve	K curve	Z curve
1P	0.5	2	-	25406	-	-
	1	2	-	25392	25460	26133
	2	2	-	25393	25462	26135
	3	2	-	25394	25463	26136
	4	2	-	25395	25464	26137
	6	2	25331	25396	25465	26139
	10	2	25332	25397	25467	26141
	16	2	25333	25398	25468	26142
	20	2	25334	25399	25469	26143
	25	2	25335	25400	25470	26145
	32	2	25336	25401	25471	26146
	40	2	25337	25402	25472	26147
	50	2	25338	25403	25473	-
	63	2	25339	25404	25474	-
2P	0.5	4	-	25407	-	-
	1	4	-	25418	25478	-
	2	4	-	25419	25480	26155
	3	4	-	25420	25481	26157
	4	4	-	25421	25482	26158
	6	4	25357	25422	25483	26159
	10	4	25358	25423	25485	26161
	16	4	25359	25424	25486	26163
	20	4	25360	25425	25487	26164
	25	4	25361	25426	25488	26165
	32	4	25362	25427	25489	26166
	40	4	25363	25428	25490	26167
	50	4	25364	25429	25491	-
	63	4	25365	25430	25492	-
3P	0.5	6	-	25408	-	-
	1	6	-	25431	25496	-
	2	6	-	25432	25498	26176
	3	6	-	25433	25499	26177
	4	6	-	25434	25500	26178
	6	6	25370	25435	25501	26180
	10	6	25371	25436	25503	26182
	16	6	25372	25437	25504	26184
	20	6	25373	25438	25505	26185
	25	6	25374	25439	25506	26224
	32	6	25375	25440	25507	26225
	40	6	25376	25441	25508	26226
	50	6	25377	25442	25509	-
	63	6	25378	25443	25510	-
4P	0.5	8	-	25409	-	-
	1	8	-	25444	25514	-
	2	8	-	25445	25516	26234
	3	8	-	25446	25517	26236
	4	8	-	25447	25518	26237
	6	8	25383	25448	25519	26239
	10	8	25384	25449	25521	26241
	16	8	25385	25450	25522	26242
	20	8	25386	25451	25523	26243
	25	8	25387	25452	25524	26244
	32	8	25388	25453	25525	26245
	40	8	25389	25454	25526	26246
	50	8	25390	25455	25527	-
	63	8	25391	25456	25528	-

PB100511



25399

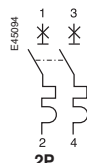


1P

PB100512



25426

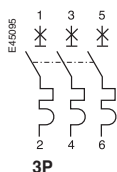


2P

PB100513



25439

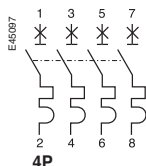


3P

PB100514



25452



4P

additional information

discrimination table: p. F23-F49
power loss: page F18
derating: page F15-F16

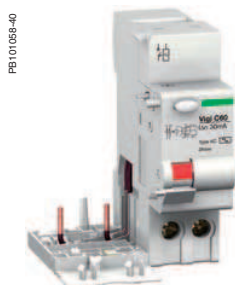
cascading: page F19 to F22
electrical auxiliaries: p. A81 to A84
Vigi module: page A18

accessories: page A85-A86
dimensions: page A108
tripping curves: page F2-F3

Type			Vigi C60											
Standard			EN 61009, IEC 60947-2 annexe B											
Type			AC			A			A si			A SiE		
Number of poles			2, 3, 4											
Voltage rating Ue (V)			130 (2P AC type)/230...400 (±10 %)											
Frequency (Hz)			50/60			50								
Current rating (A)			25	40	63	25	40	63	25	40	63	25	40	63
Sensitivity (IΔn) at 50 Hz (mA) Instantaneous	10		■			■			■			■		
	30		■	■	■	■	■	■	■	■	■	■	■	■
	100		■		■	■								
	300		■	■	■	■	■	■						
	500		■	■	■	■			■					
	1000		■	■										
Selective [S]	300 [S]							■			■		■	■
	1000 [S]							■			■		■	■
Resetting	Simultaneous (by circuit breaker)		■	■	■	■	■	■	■	■	■	■	■	■
	Separate		■	■	■	■	■	■	■	■	■	■	■	■
Utilisation temperature			-5°C to +60°C			-25°C to +60°C								
Storage temperature			-40°C to +70°C											
Test button: minimum operating voltage at 50 Hz (V)		130 V	102											
		230/400 V	176											
Rated breaking and making capacity of the residual current device IΔm (EN 61009)			Equal to the Icn of the associated circuit breaker											
Connection		Screwdriver Ø	6.5 mm blade (POSIDRIV no. 2)											
		Tightening torque (N.m)	≤ 25 A	2										
			≤ 63 A	3.5										
Terminals capacity (mm²)			≤ 25 A	25										
Rigid copper cable Cu			≤ 63 A	35										

C60 Vigi modules

Instantaneous: 10 to 1000 mA
Selective **S**: 300 mA and 1000 mA



Function

- They are used with C60 2P, 3P and 4P circuit breakers to provide:
 - protection for users against indirect contacts
 - additional protection for users against direct contacts (10 mA and 30 mA)
 - protection for electrical installations against insulation faults (fire hazard, etc.).
- Basic C60 circuit breakers retain their characteristics.

Description

The Vigi earth leakage module is electromagnetic. It operates without an auxiliary power supply. The C60 Vigi module combines the relay and toroid in a single box.

C60 Vigi modules			Type	AC	A	A si	ASiE
Applications							
Current uses				■			
Electronic loads, rectifiers, instruments, switch mode power supplies, variable speed controllers, etc...				-	■	■	■
Environment							
Disturbed networks with:	Risk of nuisance tripping due to transient voltage surges	Lightning stroke, switchgear operating on the network...		■	■	■	■
	High risk of nuisance tripping	Close lightning strokes, IT earthing system, equipment incorporating interference filters (lighting, computer systems), variable speed controllers, frequency converters, electronic lighting ballasts	Enhanced continuity of supply	-	-	■	■
	Sources of blindness	Presence of harmonics or high frequency rejections	Enhanced earth leakage protection	-	-	■	■
		Presence of DC components: equipment incorporating diodes, thyristors, triacs		-	-	■	■
Low temperatures			Use: -25°C	-	■	■	■
Humid atmospheres and/or atmospheres polluted by aggressive agents			Swimming pools, marinas, agri-food industries, water treatment plants, industrial productions sites, etc...	-	-	-	■
Tripping							
Due to sinusoidal AC currents			Whether they are applied quickly or increased slowly	■	■	■	■
Due to continuous pulsed residual currents				-	■	■	■

Instantaneous

It ensures instantaneous tripping (without time-delay).

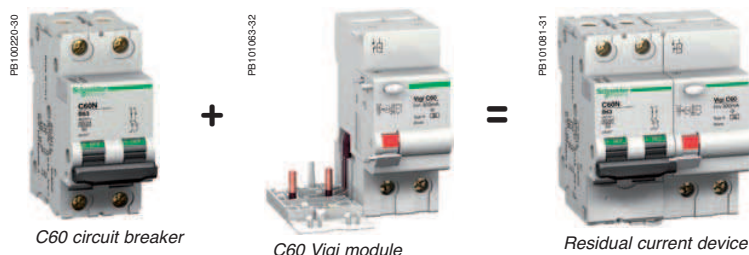
Selective **S**

Complete vertical discrimination is ensured if the following two conditions occur simultaneously:

- the downstream device is an instantaneous device and the upstream device is a selective **S** or time-delay device
- the sensitivity $I_{\Delta n}$ of the downstream device is less than $I_{\Delta n}/2$ of the upstream device.

Combination

The C60 circuit breaker + C60 Vigi module combination constitutes a residual current device in compliance with IEC 60947-2 and EN 61009.



Multipolar Protection Circuit protection breakers

C60 Vigi modules

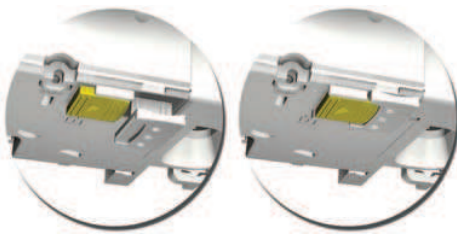
Instantaneous: 10 to 1000 mA

Selective **[S]**: 300 mA and 1000 mA

A

I

PS101082-32



Possible combinations

	Vigi C60 ≤ 25 A	Vigi C60 ≤ 40 A	Vigi C60 ≤ 63 A
C60 ≤ 25 A	■	■	■
C60 ≤ 40 A	-	■	■
C60 ≤ 63 A	-	-	■

Note: guaranteed by foolproof mechanical mounting

■ Combined C60 circuit breaker + C60 Vigi module:

- mounting without locking (disassembly possible) (fig. 1)
- mounting with locking (disassembly possible but with visible trace of disassembly as per appendix G of standard EN 61009-1) (fig. 2)
- disassembly after locking, visible trace of disassembly by breaking the lock as per appendix G standard EN 61009-1 (fig. 5).

■ Hinged captive screw shield that can be sealed with a wire, used for checking and retightening the connection terminals if required (fig. 3-4).

DB103745

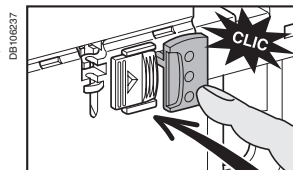


Fig. 1

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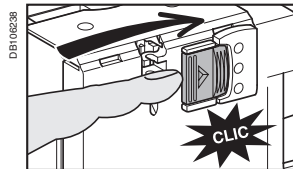
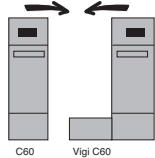


Fig. 2

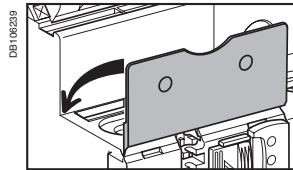


Fig. 3

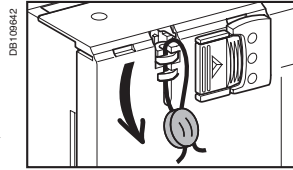


Fig. 4

DB10358

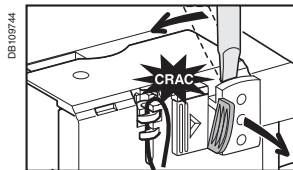
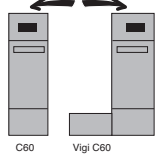


Fig. 5

Technical data

Voltage rating	130 V AC ±10 % 230...400 V AC ±10 %			
Current rating	$I_n \leq 25 \text{ A}$, $I_n \leq 40 \text{ A}$ and $I_n \leq 63 \text{ A}$			
Operating frequency	AC type: 50/60 Hz A, A si, A SiE types: 50 Hz			
Trip unit, instantaneous or selective	Fixed sensitivities for all ratings			
Test button: minimum operating voltage at 50 Hz	Vigi C60 130 V: 105 V Vigi C60 230/400 V: - 10/30/100/300 mA: 189 V - 500/1000 mA: 193 V			
Manual control, by means of a handle providing two reset modes for the C60 circuit breaker + C60 Vigi module assembly	Either with a single action Or separately The C60 Vigi module resets before the circuit breaker			
Mechanical indication	Indication of the earth fault on the front face by a red mechanical indicator on the C60 Vigi module operating handle.			
Electrical indication	By the SD indicating auxiliary switch (supplied separately)			
Operating temperature	AC type: +5°C to +60°C A, A si, A SiE types: -25°C to +60°C			
Storage temperature	-40°C to +70°C			
Connection by tunnel terminals	Flexible 16 mm ² cables or rigid 25 mm ² cables for C60 Vigi modules with ratings ≤ 25 A Flexible 25 mm ² cables or rigid 35 mm ² cables for C60 Vigi modules with ratings ≤ 40 A or ≤ 63 A.			
Weight	Type	2P	3P	4P
	Vigi ≤ 25 A	120	180	180
	Vigi ≤ 40 A	120	180	180
	Vigi ≤ 63 A	150	210	210

Accessories

- Screw shield: prevents all contact with the C60 Vigi module output terminal screws.
- Spare lock: to replace the lock, after removing a C60 Vigi module previously secured to a C60 circuit breaker.

Multipolar Protection

Circuit protection

breakers

C60 Vigi modules

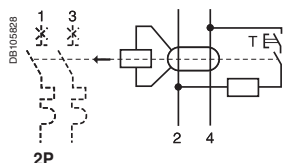
Instantaneous: 10 to 1000 mA

Selective $\mathbb{S}$: 300 mA and 1000 mA

PB101058-32



26581



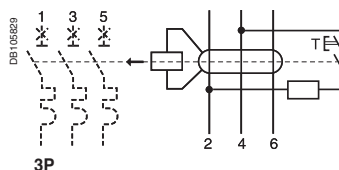
Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Cat. no.				Width in mod. of 9 mm
Type of C60 Vigi modules:				AC	A	A si	A SiE	
2P	130	≤ 25	30	26502	-	-	-	3
			300	26503	-	-	-	3
		≤ 40	30	26504	-	-	-	4
			300	26505	-	-	-	4
		≤ 63	30	26506	-	-	-	4
			300	26507	-	-	-	4
	230...400	≤ 25	10	26580	-	-	-	3
			30	26581	26743	26747	26700	3
			100	26582	26680	-	-	3
			300	26583	26745	-	-	3
			500	26584	26746	-	-	3
			1000	26585	-	-	-	3
		≤ 40	30	26600	26683	26761	26701	4
			300	26601	26685	-	-	4
			300 $\mathbb{S}$	-	-	-	26716	4
			500	26602	-	-	-	4
		≤ 63	1000	26615	-	-	-	4
			30	26611	26773	26774	26702	4
			100	26612	-	-	-	4
			300	26613	26775	-	-	4
			300 $\mathbb{S}$	-	26616	26779	26706	4
			500	26614	26776	-	-	4
			1000 $\mathbb{S}$	-	26618	26806	-	4
3P	230...400	≤ 25	30	26588	26750	26751	26719	6
			100	-	26687	-	-	6
			300	26590	26752	-	-	6
			500	26591	26753	-	-	6
		≤ 40	30	26603	-	26764	26691	7
			300	26604	-	-	-	7
		≤ 63	500	26605	-	-	-	7
			30	26620	26784	26789	26721	7
			300	26622	26790	-	-	7
			300 $\mathbb{S}$	-	26631	26794	-	7
			500	26626	26791	-	-	7
			1000 $\mathbb{S}$	-	26636	26807	-	7
	230...400	≤ 25	30	26595	26757	26756	26703	6
			100	26596	26694	-	-	6
			300	26597	26759	-	-	6
			500	26598	26760	-	-	6
		≤ 40	30	26606	26697	26767	26704	7
			300	26607	26699	-	-	7
			300 $\mathbb{S}$	-	-	-	26730	7
			500	26608	-	-	-	7
		≤ 63	30	26643	26798	26799	26705	7
			100	26644	-	-	-	7
			300	26645	26800	-	-	7
			300 $\mathbb{S}$	-	26648	26804	26707	7
			500	26646	26801	-	-	7
			1000 $\mathbb{S}$	-	26650	26808	26708	7

PB101070-32



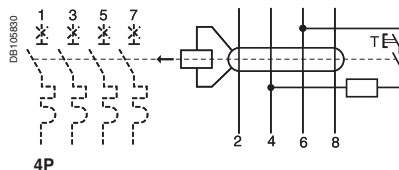
26790



PB101075-32



26756



Accessory

PB10196-23



26982

Spare

PB10197-17



26487

Type	Cat. no.	
Screw shield	Single-pole, sealable Bag of 20	26982

Type	Cat. no.	
Spare lock	Bag of 10	26487

additional
information

electrical auxiliaries: page A81
dimensions: page A108 - A109

functions

The C60H RCBO's self-contained residual current device carries out complete protection of final circuits (overcurrents and insulation faults). The neutral is not interrupted.
Protection of persons against indirect contact.
Protection of installations against fire hazards (100 mA).

Additional protection of persons against direct contact (10 and 30 mA).
A class C60H RCBO's are sensitive to the pulsed type DC component.

description

technical data

- voltage rating: 50...250 V AC
- breaking capacity:
 - IEC 1009: 10000 A
- ratings: 6...45 A at 30°C
- electrical durability (O-C cycle): 20 000
- environment:
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C)
- weight: 240 g
- connection:
 - L in : tunnel terminals for 16 mm² flexible or 25 mm² rigid cables
 - L and N out : tunnel terminals for 10 mm² flexible or 16 mm² rigid cables.

C curve

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

auxiliaries

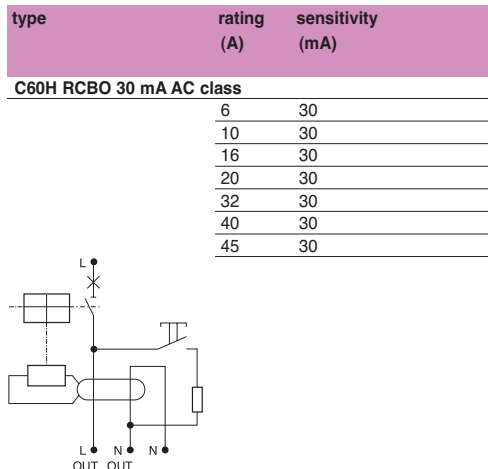
the same auxiliary functions as the C60 circuit-breaker can be added to the C60 RCBO's.

- indication:
 - **OF**: C60H RCBO ON-OFF position
 - **SD**: tripping position due to fault
- tripping:
 - **MX + OF**: shunt trip
 - **MN**: undervoltage release.

catalogue numbers



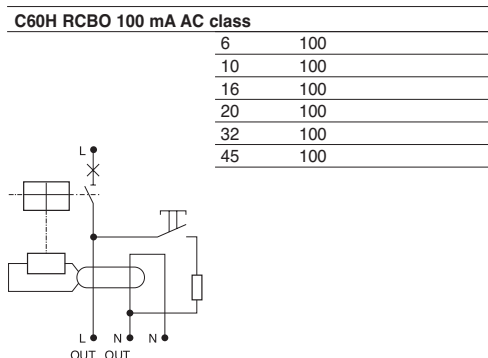
26859



catalogue number	width in mod. of 9 mm
26857	2
26858	2
26859	2
26860	2
26861	2
26862	2
26863	2



26868



26864	2
26865	2
26866	2
26867	2
26868	2
26870	2

catalogue numbers

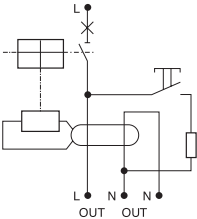


26851

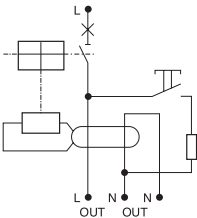


26888

type	rating (A)	sensitivity (mA)	catalogue number	width in mod. of 9 mm
C60H RCBO 10 mA A class (continued)				
	6	10	26850	2
	10	10	26851	2
	16	10	26852	2
	20	10	26853	2
	32	10	26854	2
	45	10	26856	2



C60H RCBO 30 mA A class				
	6	30	26885	2
	10	30	26886	2
	16	30	26887	2
	20	30	26888	2
	32	30	26889	2
	40	30	26890	2
	45	30	26891	2



type			C120N		C120H	
current rating (A)			63...125		10...125	
maximum voltage rating Ue (V)	AC		440			
	DC		125 V/pole			
minimum voltage rating Ue min (V AC-DC)			12			
insulation voltage Ui (V)			500			
impulse voltage Uimp (kV)			6			
number of poles			1	2, 3, 4	1	2, 3, 4
breaking capacity AC						
EN 60898 (kA)	Icn	230/400 V	10	10	15	15
	Ics		7.5		7.5	
IEC 60947.2 (kA)	Icu	130 V	20		30	
		230...240 V	10	20	15	30
		400...415 V	3 ⁽¹⁾	10	4.5 ⁽¹⁾	15
		440 V		6		10
	Ics		75 % Icu		50 % Icu	
breaking capacity DC						
IEC 60947-2 (kA) ⁽²⁾	Icu	24/48 V (1P)	10		15	
		125 V (1P)	10		15	
				10		
		250 V (2P)			15	
fast closing			■	■	■	■
isolation with positive break indication			■	■	■	■
adaptable Vigi module				■		■
auxiliaries	OF-SD, OF+SD/OF		■	■	■	■
	MN, MX-OF		■	■	■	■
	Tm		■	■	■	■
connection	screwdriver Ø (mm)		6.5 mm maximum blade (POZIDRIV No. 2)			
	tightening torque (N.m)		3.5			
	inlet dimension (mm)		H x L: 10 x 10			
utilisation temperature (°C)			-30 to +60			
storage temperature (°C)			-40 to +70			
insulating material			self-extinguishing 960 °C			

⁽¹⁾ 1-pole breaking capacity in the unearthed neutral IT system (double fault)

⁽²⁾ the number of poles participating in breaking is given between brackets

type			C120N			C120H		
thermal magnetic trip units			not interchangeable and not adjustable					
magnetic Im	curve		B	C	D	B	C	D
thermal In (A) setting current at 30°C	10					■	■	■
	16					■	■	■
	20					■	■	■
	25					■	■	■
	32					■	■	■
	40					■	■	■
	50					■	■	■
	63		■	■	■	■	■	■
	80		■	■	■	■	■	■
	100		■	■	■	■	■	■
	125		■	■	■	■	■	■

C120N circuit-breaker

B, C and D curves

EN 60898/EN 61009: **10000** -

IEC 60947-2: 10 kA

function

- protection of cables against overloads and short-circuits in final distribution
- manual control and isolation
- earth leakage protection when combined with a Vigi C120 module without temperature derating: compliance with standard: EN 61009 (refer to pages A26 to A30)
- remote tripping, indication, by adding auxiliaries common to the entire C60/C120 range (refer to pages A70 to A73).

description

Technical data

- current rating: 63 to 125 A
- voltage rating U_e max.: 440 V AC
- insulation voltage U_i : 500 V
- impulse withstand voltage U_{imp} : 6 kV
- compliance with standard EN 60898: devices accessible by unexperienced persons
- breaking capacity:
 - as in EN 60898

type	voltage (V)	breaking cap. I_{cn} (A)
1, 2, 3, 4P	230...400	10000

- as in IEC 60947.2 (I_{cu})

type	voltage (V)	breaking cap. I_{cu} (kA)
1P	130	20
	230...240	10
	400...415	3 (1)
2, 3, 4P	230...240	20
	400...415	10
	440	6

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault)

- service breaking capacity
 $I_{cs} = 75\% I_{cu}$
- positive break indication
- fast closing ensures simultaneous closing of poles
- electrical durability:
 - 63 A: 10000 cycles (O-C)
 - 80...125 A: 5000 cycles (O-C)
- limitation class: 3
- mechanical durability:
20000 cycles (O-C)
- bistable fixing pawl: simplifies disassembly
- weight (g):

1P	2P	3P	4P
205	410	615	820

- approval: IMQ
- connection:
 - flexible cables: 1.5 to 35 mm²
 - rigid cables: 1 to 50 mm²
 - terminals ensure:
 - degree of protection IP2
 - tightening of wide cross-section cables
 - pull-out withstand of cables
 - automatic guiding of cable into the correct position
- markers:
 - 4 marker clips next to the upstream terminal
 - label holder on handle (2P, 3P, 4P)
- degree of pollution: 3 (for use in an industrial environment)
- degree of protection:
 - open or surface mounted device: IP2
 - in a Pragma or Prisma enclosure: IP4 (IPxxD)

B curve

- magnetic trip units operate between 3 and 5 I_n
- protection of very long cables
- protection of networks supplied by generators

C curve

- magnetic trip units operate between 5 and 10 I_n
- protection of standard networks

D curve

- magnetic trip units operate between 10 and 14 I_n
- protection of circuits that supply high inrush current loads: transformers, motors, etc.

Multipolar Protection Circuit protection breakers

C120N circuit-breaker

D curve

EN 60898/EN 61009: **10000** -
IEC 60947-2: 10 kA

A

I

catalogue numbers



18359



18385



18351



18355

type	rating (A)	catalogue number			width in mod. of 9 mm
C120N		B curve	C curve	D curve	
1P 	63	18340	18356	18378	3
	80	18341	18357	18379	3
	100	18342	18358	18380	3
	125	18343	18359	18381	3
2P 	63	18344	18360	18382	6
	80	18345	18361	18383	6
	100	18346	18362	18384	6
	125	18347	18363	18385	6
3P 	63	18348	18364	18386	9
	80	18349	18365	18387	9
	100	18350	18367	18388	9
	125	18351	18369	18389	9
4P 	63	18352	18371	18390	12
	80	18353	18372	18391	12
	100	18354	18374	18392	12
	125	18355	18376	18393	12

additional information

auxiliaries: page A81 to A84
accessories: page A85-A86
Vigi module: page A26 to A30

discrimination table: p. F23-F49
dimensions: page A108
derating: page F17

tripping curves: page F4
power loss: F18
cascading: F19 to F22

C120H circuit-breaker

B, C and D curves

EN 60898/EN 61009: **15000** -

IEC 60947-2: 15 kA

function

- protection of cables against overloads and short-circuits in final distribution
- manual control and isolation
- earth leakage protection when combined with a Vigi C120 module without temperature derating: compliance with standard: EN 61009 (refer to pages A26 to A30)
- remote tripping, indication, by adding auxiliaries common to the entire C60/C120 range (refer to pages A70 to A73).

description

Technical data

- current rating: 10 to 125 A
- max. voltage rating U_e : 440 V AC
- insulation voltage U_i : 500 V
- impulse withstand voltage U_{imp} : 6 kV
- compliance with standard EN 60898: devices accessible by unexperienced persons
- breaking capacity:
 - as EN 60898

type	voltage (V)	breaking cap. I_{cn} (A)
1, 2, 3, 4P	230...400	15000

- as IEC 60947-2 (I_{cu})

type	voltage (V)	breaking cap. I_{cu} (kA)
1P	130	30
	230...240	15
	400...415	4.5 ⁽¹⁾
2, 3, 4P	230...240	30
	400...415	15
	440	10

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault)

- service breaking capacity
 $I_{cs} = 50\% I_{cu}$
- positive break indication
- fast closing ensures simultaneous closing of poles
- electrical durability:
 - ≤ 63 A: 10000 cycles (O-C)
 - 80...125 A: 5000 cycles (O-C)
- limitation class: 3
- mechanical durability:
20000 cycles (O-C)
- bistable fixing pawl: simplifies disassembly
- weight (g):

1P	2P	3P	4P
205	410	615	820

- approval: IMQ
- connection:
 - flexible cables: 1.5 to 35 mm²
 - rigid cables: 1 to 50 mm²
 - terminal ensure:
 - degree of protection IP2
 - tightening of wide cross-section cables
 - pull-out withstand of cables
 - automatic guiding of cable into the correct position
- markers:
 - 4 marker clips next to the upstream terminal
 - label holder on handle (2P, 3P, 4P)
- degree of pollution: 3 (for use in an industrial environment)
- degree of protection:
 - open or surface mounted device: IP2
 - in a Pragma or Prisma enclosure: IP4 (IPxxD)

B curve

- magnetic trip units operate between 3 and 5 I_n
- protection of very long cables
- protection of networks supplied by generators

C curve

- magnetic trip units operate between 5 and 10 I_n
- protection of standard networks

D curve

- magnetic trip units operate between 10 and 14 I_n
- protection of circuits that supply high inrush current loads: transformers, motors, etc.

Multipolar Protection Circuit protection breakers

C120H circuit-breaker B, C and D curves EN 60898/EN 61009: 15000 - IEC 60947-2: 15 kA

A

I

catalogue numbers



18482



18415



18426



18525

type	rating (A)	catalogue number			width in mod. of 9 mm
C120H		B curve	C curve	D curve	
1P 	10	18394	18438	18482	3
	16	18395	18439	18483	3
	20	18396	18440	18484	3
	25	18397	18441	18485	3
	32	18398	18442	18486	3
	40	18399	18443	18487	3
	50	18400	18444	18488	3
	63	18401	18445	18489	3
	80	18402	18446	18490	3
	100	18403	18447	18491	3
	125	18404	18448	18492	3
2P 	10	18405	18449	18493	6
	16	18406	18450	18494	6
	20	18407	18451	18495	6
	25	18408	18452	18496	6
	32	18409	18453	18497	6
	40	18410	18454	18498	6
	50	18411	18455	18499	6
	63	18412	18456	18500	6
	80	18413	18457	18501	6
	100	18414	18458	18502	6
	125	18415	18459	18503	6
3P 	10	18416	18460	18504	9
	16	18417	18461	18505	9
	20	18418	18462	18506	9
	25	18419	18463	18507	9
	32	18420	18464	18508	9
	40	18421	18465	18509	9
	50	18422	18466	18510	9
	63	18423	18467	18511	9
	80	18424	18468	18512	9
	100	18425	18469	18513	9
	125	18426	18470	18514	9
4P 	10	18427	18471	18515	12
	16	18428	18472	18516	12
	20	18429	18473	18517	12
	25	18430	18474	18518	12
	32	18431	18475	18519	12
	40	18432	18476	18520	12
	50	18433	18477	18521	12
	63	18434	18478	18522	12
	80	18435	18479	18523	12
	100	18436	18480	18524	12
	125	18437	18481	18525	12

additional information

auxiliaries: page A81 to A84
accessories: page A85-A86
Vigi module: page A26 to A30

discrimination table: p. F23-F49
dimensions: page A108
derating: page F17

tripping curves: page F4
power loss: F18
cascading: F19 to F22

Multipolar Protection

Circuit protection

breakers

C120 Vigi module choice tables

type		Vigi C120				
Standard		EN 61009, IEC 60947-2 annexe B				
Type		AC	A	A si	A SiE	
Number of poles		2, 3, 4			3,4	
Voltage rating Ue (V)		230...415 (±10 %)				
Frequency (Hz)		50/60			50	
Current rating (A)		125				
Sensitivity (IΔn) at 50 Hz (mA)	10					
	Instantaneous	30	■	■	■	■
		300	■	■	■	■
		500	■	■	■	
	Selective 	300 	■	■	■	■
500 			■			
1000 		■	■	■	■	
Resetting	Simultaneous (by circuit breaker)		■	■		
	Separate	■	■	■		
Utilisation temperature		-5°C to +60°C		-25°C to +40°C		
Storage temperature		-40°C to +60°C				
Test button: minimum operating voltage at 50 Hz (V)		230/415 V	176			
Rated breaking and making capacity of the residual current device IΔm (EN 61009)		Equal to the Icn of the associated circuit breaker				
Connection	Screwdriver Ø	6.5 mm blade (POSIDRIV no. 2)				
	Tightening torque (N.m)	3.5				
Terminals capacity (mm²)		≤ 125 A				
Rigid copper cable Cu		50				

function

Adaptable to C120 circuit-breakers from 10 to 125 A - 2, 3, 4P, the Vigi C120 module ensures:

- the protection of electrical installations against insulation faults
 - the protection of persons against indirect contact: medium sensitivities (300, 500, 1000 mA)
 - additional protection of persons against direct contact: high sensitivity (30 mA)
- The 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 C120 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

A class

Class A  : ensures tripping with a DC component current Vigi module for which tripping is ensured by sinusoidal AC currents as well as by pulsed DC currents whether they are quickly applied or rise slowly.

Application: loads with electronics, rectifiers, instruments.

“si” type

Reinforced continuity of supply on disturbed networks with:

- a high risk of nuisance tripping:
 - successive lightning strokes
 - IT earthing system
 - variable speed controllers, frequency converters
 - presence of electronic ballasts
 - presence of switchgear that incorporates interference filters i.e. lighting, micro-computing, etc.
- sources of blinding:
 - presence of harmonics or high frequency rejection
 - presence of DC components: diodes, thyristors, triacs
 - low temperature.

“SiE” type

The “SiE” types Vigi C120 modules are particularly suitable for use in humid environments and/or environments polluted by aggressive agents, for example swimming pools, marinas, the food-processing industry, water treatment plants, industrial sites.

They also incorporate “si” type Vigi C120 modules functions.

Instantaneous

It ensures instantaneous tripping (not time-delayed)

Selective

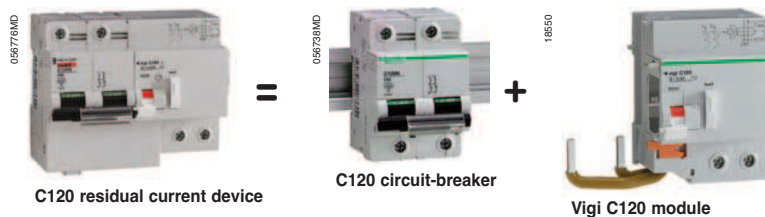
Selective  Vigi modules allow for total vertical discrimination if:

- upstream devices are  or delayed
- downstream devices are instantaneous and their sensitivity is less than $I\Delta n/2$ of the upstream device.

C120 Vigi modules

AC, A, class, “si” and “SiE” types
EN 61009-IEC 60947.2 appendix B

combination of earth leakage modules with circuit-breakers



description

Common technical data

- the Vigi C120 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  trip units
- reinforced electromagnetic compatibility

Technical data

- frequency :
 - AC and A classes: 50/60 Hz
 - “si” and “SiE” types: 50 Hz
- impulse withstand level 8/20 μ s:
 - AC and A classes:
 - 250 A for instantaneous
 - 3 kA for 
 - “si” and “SiE” types:
 - 3 kA for instantaneous
 - 5 kA for 
- remote tripping:
 - possible using an MX or MN release on circuit-breaker
- connection (identical to C120 circuit-breakers) :
 - flexible cables: 1.5 to 35 mm²
 - rigid cables: 1 to 50 mm²
- width of C120 residual current device + Vigi module:
(in number of mod. of 9 mm)

2P	3P	4P
13 (6+7)	19 (9+10)	22 (12+10)

- weight (g):

2P	3P	4P
325	500	580

- 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.
- operating temperature:
 - AC class: -5...+60°C
 - A class, “si” and “SiE” types: -25...+40°C

Multipolar Protection Circuit protection breakers

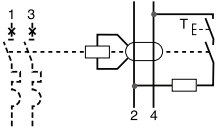
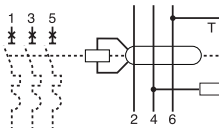
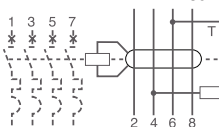
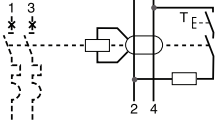
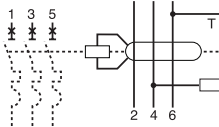
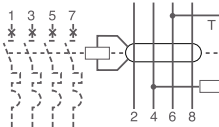
C120 Vigi Modules

AC, A, class, " si" and " SiE" types
EN 61009-IEC 60947.2 appendix B

A

I

catalogue numbers

type	voltage (V)	sensitivity (mA)	catalogue numbers
class AC C120 Vigi module			
2P 	230...415	30	18563
		300	18564
		300 [S]	18544
		500	18565
		1000 [S]	18545
3P 	230...415	30	18566
		300	18567
		300 [S]	18546
		500	18568
		1000 [S]	18547
4P 	230...415	30	18569
		300	18570
		300 [S]	18548
		500	18571
		1000 [S]	18549
class A C120 Vigi module			
2P 	230...415	30	18572
		300	18573
		300 [S]	18581
		500	18574
		500 [S]	18582
		1000 [S]	18583
3P 	230...415	30	18575
		300	18576
		300 [S]	18584
		500	18577
		500 [S]	18585
		1000 [S]	18586
4P 	230...415	30	18578
		300	18579
		300 [S]	18587
		500	18580
		500 [S]	18588
		1000 [S]	18589



18564



18566



18570



18573



18575



18579

C120 Vigi Modules

AC, A, class, " si" and " SiE" types
EN 61009-IEC 60947.2 appendix B

catalogue numbers

18592



18592

18594



18594

18598



18598

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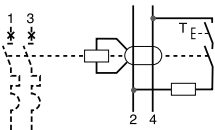
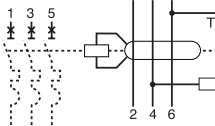
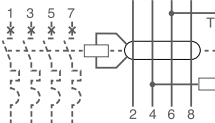
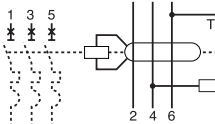
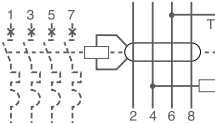


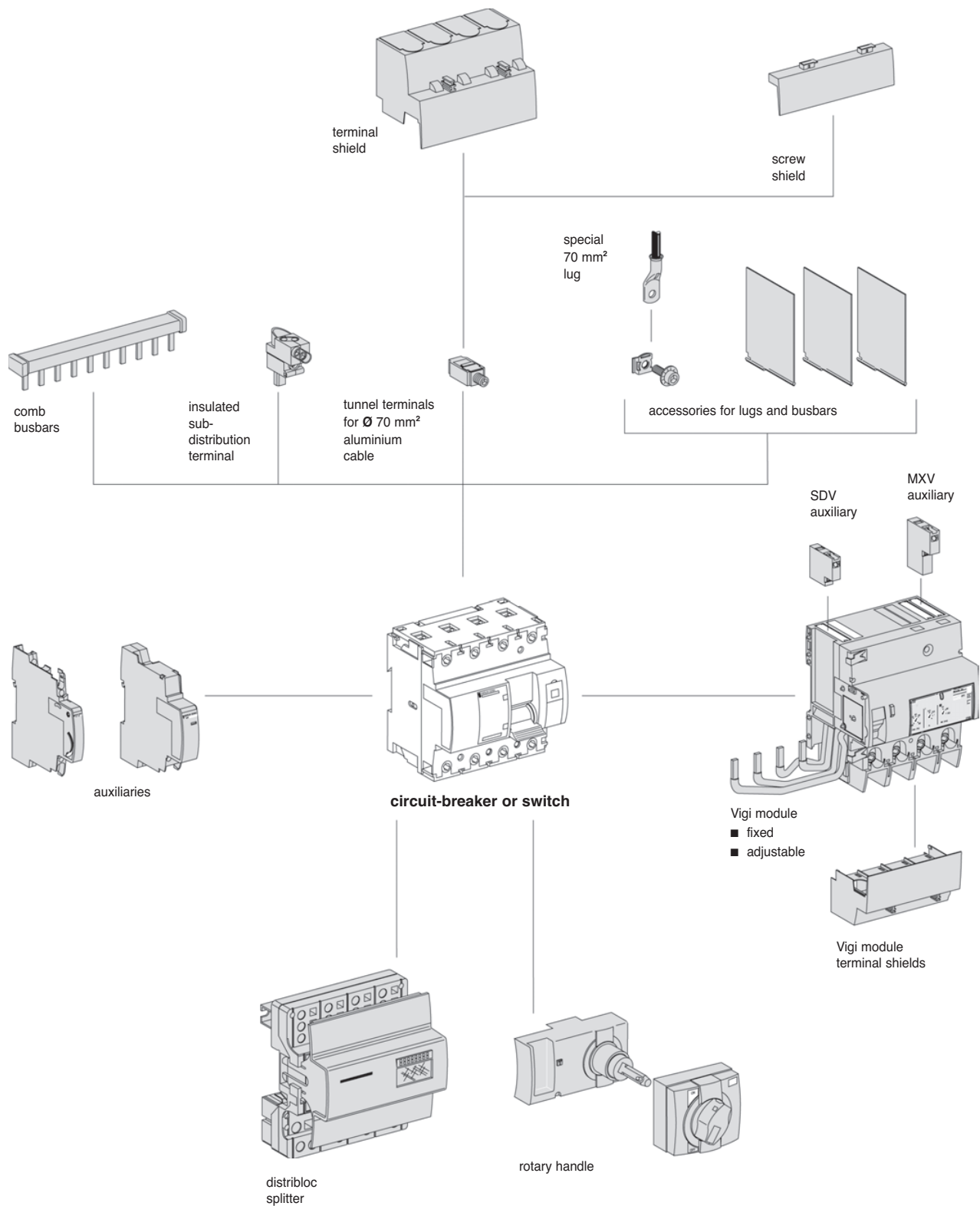
18676

PB100008



18600

type	voltage (V)	sensitivity (mA)	catalogue numbers
"si" type C120 Vigi module			
2P 	230...415	30	18591
		300	18592
		300 [S]	18556
		500	18593
		1000 [S]	18557
3P 	230...415	30	18594
		300	18595
		300 [S]	18558
		500	18596
		1000 [S]	18559
4P 	230...415	30	18597
		300	18598
		300 [S]	18560
		500	18599
		1000 [S]	18561
"SiE" type C120 Vigi module			
3P 	230...415	30	18676
		300	18677
4P 	230...415	30	18602
		300	18678
		300 [S]	18600
		1000 [S]	18601



Multipolar Protection

Circuit protection breakers

Choice of NG125 circuit-breakers

circuit-breakers

standard	number of poles	ratings	type	curves	magnetic threshold In	breaking capacity at 415 V (kA)			
						16	25	36	50
IEC 947.2	1, 2	10 to 80	NG125N	C	8				
	3, 4	10 to 125	NG125N	C	8				
	3, 4	80 to 125	NG125N	B	4				
	3, 4	80 to 125	NG125N	D	12				
	1, 2, 3, 4	10 to 80	NG125H	C	8				
	1, 2, 3, 4	10 to 80	NG125L	B, C, D	4 - 8 - 12				
	2, 3	4 to 80	NG125LMA	MA	12				

choice of circuit-breakers

type				NG125N		NG125H		NG125L		NG125LMA		
impulse voltage U _{imp} (kV)				8		8		8		8		
insulation voltage U _i (V)				690		690		690		690		
maximum voltage rating U _e (V)				500		500		500		500		
number of poles				1	2, 3, 4	1	2, 3, 4	1	2, 3, 4	-	2, 3	
breaking capacity (kA) IEC 947.2	Icu	AC	110...130 V	50	-	70	-	100	-	-	-	
			220...240 V	25	50	36	70	50	100	-	100	
			380...415 V	6	25	9	36	12.5	50	-	50	
			440 V	-	20	-	30	-	40	-	40	
		DC	500 V	6	8	6	10	6	12	6	12	
			60 V	25	-	36	-	50	-	-	-	
			125 V per pole	25	-	36	-	50	-	-	-	
			250 V	-	25 (2P)	-	36 (2P)	-	50 (2P)	-	-	
	Ics	AC	500 V	-	25 (4P)	-	36 (4P)	-	50 (4P)	-	-	
			DC	75% Icu		75% Icu		75% Icu		75% Icu		
					100% Icu		100% Icu		100% Icu		100% Icu	
tripping curves / ratings (A)	B curve	40 °C	80...125		-		10...80		-			
	C curve	40 °C	10...125		10...80		10...80		-			
	D curve	40 °C	80...125		-		10...80		-			
	MA curve	40 °C	-		-		-		4...80			
fast closing				■		■		■		■		
positive break indication				■		■		■		■		
auxiliaries				■		■		■		■		
degree of pollution 3				■		■		■		■		

function

This circuit-breaker is specially designed for functions requiring a high breaking capacity (up to 25 kA):

- modular enclosure incomer,
- main incomer in sub-distribution switchboards,
- outgoing, protection of loads directly supplied by a power switchboard.

description

common technical data

- rating: 10...125 A
- reference temperature: 40 °C
- Uimp: 8 kV
- Ui: 690 V
- maximum voltage rating: 500 V AC
- breaking capacity: as in IEC 60947.2

type	voltage (V AC)	breaking capacity (A)
1P	220...240	25000
1P	380...415	6000 (1)
2, 3, 4P	380...415	25000

(1) 1-pole breaking capacity in the IT isolated neutral system (double fault).

- isolation with positive break indication
- 3-position toggle: open-tripped-closed
- built-in padlocking facility on 3P and 4P
- fault display on front face by:
 - fault indicator
 - position of toggle: tripped
- test button to check proper operation of the tripping mechanism
- fast closing
- electrical durability: 10 000 cycles at In
- tropicalisation as in IEC 68.1: treatment 2 (relative humidity: 95 % at 55 °C)

weight (g):

type	1P	2P	3P	4P
	240	480	720	960

- compatible with the Pragma 24 and Prisma G enclosures and the Prisma P cabinets,
- degree of protection: IP20B (IP40D for the part outside the enclosure)
- connection:
 - ≤ 63 A ratings: tunnel terminals for 1.5 to 50 mm² copper cables
 - 80 to 125 A ratings: tunnel terminals for 16 to 70 mm² copper cables
 - aluminium cables, copper cables with lug or busbar (see connection accessories)
 - on 3P and 4P: upstream voltage taps on each pole, by 6.35 mm Fast-on lugs, for auxiliary circuit supply

B curve

- the magnetic trip units operate at $4 I_n \pm 20 \%$

C curve

- the magnetic trip units operate at $8 I_n \pm 20 \%$

D curve

- the magnetic trip units operate at $12 I_n \pm 20 \%$

catalogue numbers

type	rating (A)	catalogue number	width in mod. of 9 mm
NG125N B curve			
	80	18663	9
	100	18664	9
	125	18665	9
	80	18666	12
	100	18667	12
	125	18668	12

Multipolar Protection

Circuit protection

breakers

NG125N circuit-breaker

B, C and D curves

IEC 60947-2: 25 kA

catalogue numbers



18617



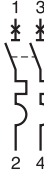
18628



18644



18662

type	rating (A)	catalogue number	width in mod. of 9 mm	
NG125N		C curve	D curve	
1P 	10	18610	-	3
	16	18611	-	3
	20	18612	-	3
	25	18613	-	3
	32	18614	-	3
	40	18615	-	3
	50	18616	-	3
	63	18617	-	3
	80	18618	-	3
2P 	10	18621	-	6
	16	18622	-	6
	20	18623	-	6
	25	18624	-	6
	32	18625	-	6
	40	18626	-	6
	50	18627	-	6
	63	18628	-	6
	80	18629	-	6
3P 	10	18632	-	9
	16	18633	-	9
	20	18634	-	9
	25	18635	-	9
	32	18636	-	9
	40	18637	-	9
	50	18638	-	9
	63	18639	-	9
	80	18640	18669	9
	100	18642	18670	9
	125	18644	18671	9
4P 	10	18649	-	12
	16	18650	-	12
	20	18651	-	12
	25	18652	-	12
	32	18653	-	12
	40	18654	-	12
	50	18655	-	12
	63	18656	-	12
	80	18658	18672	12
	100	18660	18673	12
	125	18662	18674	12

additional information

auxiliaries: page A93 to A95
power loss: page F18
cascading: page F19 to F22

accessories: page A96 to A98
Vigi module: page A39 to A45
discrimination table: p. F23-F49

dimensions: page A108
tripping curves: page F5
derating: page F16

function

This circuit-breaker is specially designed for functions requiring a high breaking capacity (up to 36 kA):

- main incomer in the sub-distribution switchboards;
- outgoing, protection of loads directly supplied by a power switchboard.

description

common technical data

- rating: 10...80 A
- reference temperature: 40 °C
- Uimp: 8 kV
- Ui: 690 V
- maximum voltage rating: 500 V AC
- breaking capacity: as in IEC 947.2

type	voltage (V) AC	breaking capacity (A)
1P	220...240	36000
1P	380...415	9000 (1)
2, 3, 4P	380...415	36000

(1) 1-pole breaking capacity in the IT isolated neutral system (double fault).

- isolation with positive break indication
- 3-position toggle: open-tripped-closed
- built-in padlocking facility on 3P and 4P
- fault display on front face by:
 - fault indicator
 - position of toggle: tripped
- test button to check proper operation of the tripping mechanism
- fast closing

- electrical durability: 10 000 cycles at In
- tropicalisation as in IEC 68.1: treatment 2 (relative humidity: 95 % at 55 °C)
- weight (g):

type	1P	2P	3P	4P
	240	480	720	960

- compatible with Pragma 24 and Prisma G enclosures and Prisma P cabinets
- degree of protection: IP20B (IP40D for the part outside the enclosure)
- connection:
 - ≤ 63 A ratings: tunnel terminals for 1.5 to 50 mm² copper cables
 - 80 A rating: tunnel terminals for 16 to 70 mm² copper cables
 - connection of aluminium cables, copper cables with lug or busbar for 3P and 4P (see connection accessories)
 - upstream voltage taps on each pole, by 6.35 mm Fast-on lugs, for auxiliary circuit supply

C curve

- the magnetic trip units operate at $8 I_n \pm 20 \%$

catalogue numbers



18712



18721

type	rating (A)	catalogue number	width in mod. of 9 mm
NG125H C curve			
1P	10	18705	3
	16	18706	3
	20	18707	3
	25	18708	3
	32	18709	3
	40	18710	3
	50	18711	3
	63	18712	3
	80	18713	3
2P	10	18714	6
	16	18715	6
	20	18716	6
	25	18717	6
	32	18718	6
	40	18719	6
	50	18720	6
	63	18721	6
	80	18722	6

NG125H circuit-breaker

C curve

IEC 947.2: 36 kA

catalogue numbers



18730



18739

type	rating	catalogue number	width in mod. of 9 mm
(A)			
NG125H C curve (continued)			
3P 	10	18723	9
	16	18724	9
	20	18725	9
	25	18726	9
	32	18727	9
	40	18728	9
	50	18729	9
	63	18730	9
	80	18731	9
4P 	10	18732	12
	16	18733	12
	20	18734	12
	25	18735	12
	32	18736	12
	40	18737	12
	50	18738	12
	63	18739	12
	80	18740	12

function

This circuit-breaker is specially designed for functions requiring a high breaking capacity (up to 50 kA):
- outgoer, protection of loads directly supplied by a power switchboard.

description

common technical data

- rating: 10...80 A
- reference temperature: 40 °C
- Uimp: 8 kV
- Ui: 690 V
- maximum voltage rating: 500 V AC
- breaking capacity: as in IEC 947.2.

type	voltage (V) AC	breaking capacity (A)
1P	220...240	50000
1P	380...415	12500 (1)
2, 3, 4P	380...415	50000

(1) 1-pole breaking capacity in the IT isolated neutral system (double fault).

- isolation with positive break indication
- 3-position toggle: open-tripped-closed
- built-in padlocking facility on 3P and 4P
- fault display on front face by:
 - fault indicator
 - position of toggle: tripped
- test button to check proper operation of the tripping mechanism
- fast closing

- electrical durability: 10 000 cycles at In
- tropicalisation as in IEC 68.1: treatment 2 (relative humidity: 95 % at 55 °C)
- weight (g):

type	1P	2P	3P	4P
	240	480	720	960

- compatible with Pragma 24 and Prisma G enclosures and Prisma P cabinets
- degree of protection: IP20B (IP40D for the part outside the enclosure)
- connection:
 - ≤ 63 A ratings: tunnel terminals for 1.5 to 50 mm² copper cables
 - 80 A rating: tunnel terminals for 16 to 70 mm² copper cables
 - aluminium cables, copper cables with lug or busbar (see connection accessories)
 - on 3P and 4P: upstream voltage taps on each pole, by 6.35 mm Fast-on lugs, for auxiliary circuit supply

B curve

- the magnetic trip units operate at $4 I_n \pm 20 \%$

C curve

- the magnetic trip units operate at $8 I_n \pm 20 \%$

D curve

- the magnetic trip units operate at $12 I_n \pm 20 \%$

Multipolar Protection

Circuit protection

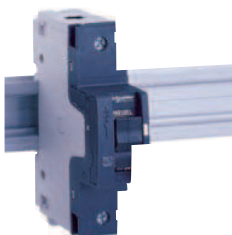
breakers

NG125L circuit-breaker

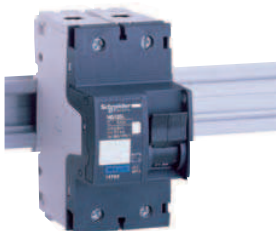
B, C and D curves

IEC 947.2: 50 kA

catalogue numbers



18784



18793



18806



18862

type	rating (A)	catalogue number			width in mod. of 9 mm
NG125L		B curve	C curve	D curve	
1P	10	18741	18777	18830	3
1	16	18742	18778	18831	3
1	20	18743	18779	18832	3
1	25	18744	18780	18833	3
1	32	18745	18781	18834	3
1	40	18746	18782	18835	3
1	50	18747	18783	18836	3
1	63	18748	18784	18837	3
2	80	18749	18785	18838	3
2P	10	18750	18788	18839	6
1 3	16	18751	18789	18840	6
1 3	20	18752	18790	18841	6
1 3	25	18753	18791	18842	6
1 3	32	18754	18792	18843	6
1 3	40	18755	18793	18844	6
1 3	50	18756	18794	18845	6
1 3	63	18757	18795	18846	6
2 4	80	18758	18796	18847	6
3P	10	18759	18799	18848	9
1 3 5	16	18760	18800	18849	9
1 3 5	20	18761	18801	18850	9
1 3 5	25	18762	18802	18851	9
1 3 5	32	18763	18803	18852	9
1 3 5	40	18764	18804	18853	9
1 3 5	50	18765	18805	18854	9
1 3 5	63	18766	18806	18855	9
2 4 6	80	18767	18807	18856	9
4P	10	18768	18810	18857	12
1 3 5 7	16	18769	18811	18858	12
1 3 5 7	20	18770	18812	18859	12
1 3 5 7	25	18771	18813	18860	12
1 3 5 7	32	18772	18814	18861	12
1 3 5 7	40	18773	18815	18862	12
1 3 5 7	50	18774	18816	18863	12
1 3 5 7	63	18775	18817	18864	12
2 4 6 8	80	18776	18818	18865	12

additional information

auxiliaries: page A93 to A95
power loss: page F18
cascading: page F19 to F22

accessories: page A96 to A98
Vigi module: page A39 to A45
discrimination table: p. F23-F49

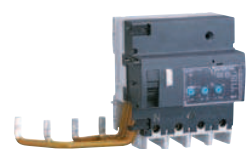
dimensions: page A108
tripping curves: page F5
derating: page F16



NG125
residual current
circuit-breaker or device



NG125
circuit-breaker or
switch-disconnector



NG125
Vigi module

Vigi module A class		10 - 63 A		80 - 125 A	
		pole	page	pole	page
adjustable	300, 500, 1000 mA instantaneous, selective [S]			3P, 4P	A44-A45
	300, 500, 1000, 3000 mA instantaneous, selective, delayed	3P, 4P	A44-A45	3P, 4P	A44-A45
non adjustable	30 mA	2P, 3P, 4P	A41-A42	3P, 4P	A41-A42
	300 mA	2P, 3P, 4P	A44-A45	4P	A44-A45
	300 mA selective [S]	2P, 3P, 4P	A44-A45		
	1000 mA selective [S]	2P, 3P, 4P	A44-A45		

Vigi module AC class		10 - 63 A	
		pole	page
non adjustable	30 mA	2P, 3P, 4P	A41-A42
	300 mA	2P, 3P, 4P	A44-A45

Vigi module "si" type		80 - 125 A	
		pole	page
adjustable	300, 500, 1000 mA instantaneous, selective, delayed		
		3P, 4P	A45
non adjustable	30 mA	3P, 4P	A42

High sensitivity Vigi NG125

30 mA instantaneous, IEC 60947-2

function

The Vigi NG125 residual current device is electromechanical. It completes the NG125 circuit-breakers to provide additional protection of persons against direct contact.

Since it operates without an auxiliary source of supply, its scope of application is extensive. The circuit-breakers retain their properties.

AC class

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

A class

Class A  : ensures tripping with a DC component current Vigi module for which tripping is ensured by sinusoidal AC currents as well as by pulsed DC currents whether they are quickly applied or rise slowly.

Application: loads with electronics, rectifiers, instruments.

“si” type

Reinforced continuity of supply on disturbed networks with:

- a high risk of nuisance tripping:
 - successive lightning strokes
 - IT earthing system
 - variable speed controllers, frequency converters
 - presence of electronic ballasts
 - presence of switchgear that incorporates interference filters i.e. lighting, micro-computing, etc.
- sources of blinding:
 - presence of harmonics or high frequency rejection
 - presence of DC components: diodes, thyristors, triacs
 - low temperature.

It is particularly suitable for use in humid environments and/or environments polluted by aggressive agents, for example swimming pools, marinas, the food-processing industry, water treatment plants, industrial sites.

Instantaneous

It ensures instantaneous tripping (not time-delayed)

Selective and R

Selective  and R Vigi modules allow for total vertical discrimination if:

- downstream devices are instantaneous and their sensitivity is less than $I\Delta n/2$ of the upstream device.
- and if the non-response time of the upstream device is ≥ 1.2 times the opening time of the downstream device.

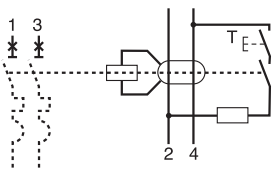
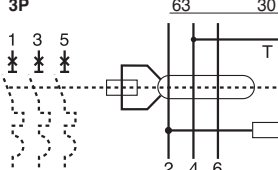
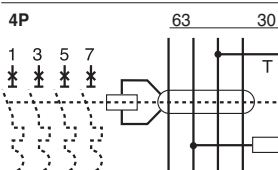
technical data

- in the presence of equipment containing rectifying devices (diodes, thyristors, triacs), use an A class instantaneous residual current circuit-breaker guaranteeing tripping on detection of a DC component
- incorporates in a single case:
 - the residual current relay
 - the toroid
- connection to the circuit-breaker by rigid links (compact size) insulated by a wire shield (supplied) (degree of protection IP40D)
- earth fault display on the front face of the Vigi module by reset handle
- voltage rating: 230...415 V AC
- frequency: 50/60 Hz
- Uimp: 8 kV
- Ui: 690 V
- rated current: 63 A or 125 A with locating device:
 - 63 A for 63 A circuit-breakers
 - 125 A for 80, 100 and 125 A circuit-breakers
- auxiliaries that can be plugged onto Vigi 125 A:
 - remote tripping by MXV,
 - remote indication of earth fault trip by SDV switch
- weight (g) of Vigi only:

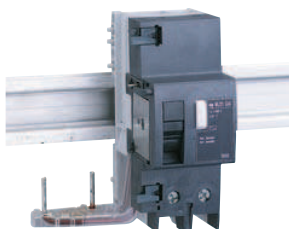
type	2P	3P	4P
5 mod.	250		
9 mod.		410	450
11 mod.		750	800

- connection:
 - ≤ 63 A ratings: tunnel terminals for 1.5 to 50 mm² copper cables
 - 80 to 125 A ratings: tunnel terminals for 16 to 70 mm² copper cables
 - aluminium cables, copper cables with lug (see connection accessories).

catalogue numbers

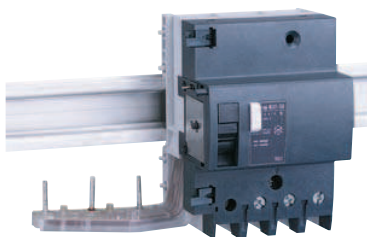
type	rating ≤ (A)	sensitivity (mA)	catalogue numbers	width in mod. of 9 mm
AC class ~				
2P	63	30	19000	5
				
3P	63	30	19002	9
				
4P	63	30	19004	9
				

054381



19000

185166



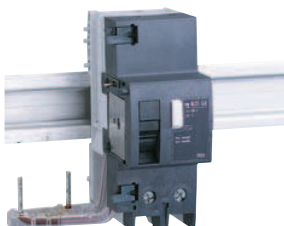
19002

High sensitivity Vigi NG125

30 mA instantaneous,

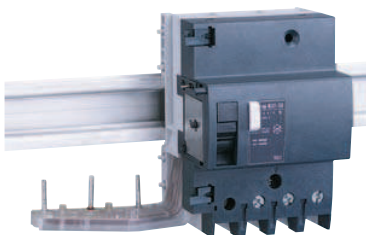
IEC 60947-2

054381



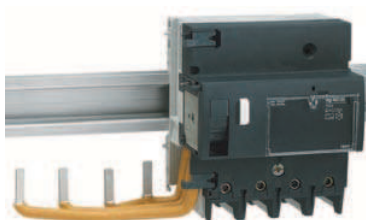
19010

054383



19013

057486



19015

catalogue numbers

type	rating ≤ (A)	sensitivity (mA)	catalogue numbers	width in mod. of 9 mm
A class				
2P	63	30	19010	5
			19008 (1)	5
3P	63	30	19013	9
	125	30	19039	11
4P	63	30	19015	9
	125	30	19041	11
(1) voltage rating: 110...220 V AC				
"si" type				
3P	125	30	19100	11
4P	125	30	19101	11

function

The Vigi NG125 residual current release is electromechanical and operates without an auxiliary source of supply. Its scope of application is therefore extensive.

- It completes the NG125 circuit-breakers to provide:
 - protection of persons against indirect contact
 - protection of electrical installations against insulation faults
 - total vertical discrimination is guaranteed on an earth fault provided that there is both:
 - a 1-index deviation in sensitivity
 - a 1-index deviation in time delay
- The circuit-breakers retain their properties.

AC class

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

A class

Class A  : ensures tripping with a DC component current Vigi module for which tripping is ensured by sinusoidal AC currents as well as by pulsed DC currents whether they are quickly applied or rise slowly.

Application: loads with electronics, rectifiers, instruments.

“si” type

Reinforced continuity of supply on disturbed networks with:

- a high risk of nuisance tripping:
 - successive lightning strokes
 - IT earthing system
 - variable speed controllers, frequency converters
 - presence of electronic ballasts
 - presence of switchgear that incorporates interference filters i.e. lighting, micro-computing, etc.
- sources of blinding:
 - presence of harmonics or high frequency rejection
 - presence of DC components: diodes, thyristors, triacs
 - low temperature.

It is particularly suitable for use in humid environments and/or environments polluted by aggressive agents, for example swimming pools, marinas, the food-processing industry, water treatment plants, industrial sites.

Instantaneous

It ensures instantaneous tripping (not time-delayed)

Selective and R

Selective  and R Vigi modules allow for total vertical discrimination if:

- downstream devices are instantaneous and their sensitivity is less than $I\Delta n/2$ of the upstream device.
- and if the non-response time of the upstream device is ≥ 1.2 times the opening time of the downstream device.

Medium sensitivity Vigi NG125

instantaneous, selective, delayed (300 to 3000 mA), IEC 60947-2

technical data

- incorporates in a single case:
 - the residual current relay
 - the toroid
- connection to the circuit-breaker by rigid links (compact size) insulated by wire shield supplied (degree of protection IP40D)
- earth fault display:
 - on the front face of the Vigi by reset handle
- voltage rating: 230...415 V AC
- frequency: 50/60 Hz
- Uimp: 8 kV
- Ui: 690 V
- 8/20 μ s impulse withstand
 - $\square$ or adjustable: 5 kA
 - instantaneous: 3 kA
- rated current: 63 or 125 A with locating device:
 - 63 A: for $\leq$ 63 A circuit-breakers
 - 125 A: for 80 - 100 - 125 A circuit-breakers.

specific technical data of the adjustable Vigi

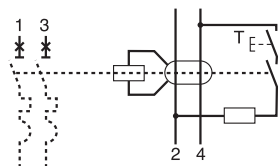
- $I_{\Delta n}$ sensitivity adjustable by index: 300, 500, 1000, 3000 mA
- adjustable tripping time:
 - instantaneous
 - selective: 60 ms
 - delayed: 150 ms
- leakage current indication on 3P and 4P 300...3000 I/S/D:
 - on the front face by LED
 - remotely, by 250V - 1A (low level) potential-free NO contact, connected by 2 x 1.5 mm² plate terminal
 - threshold setting by potentiometer from 10 to 50 % of $I_{\Delta n}$
- disconnection essential for dielectric testing by built-in pushbutton
- auxiliaries plugged onto 125 A and 63 A Vigi I / S / D:
 - remote tripping by MXV
 - remote indication of earth fault trip by SDV switch
- weight (g) of Vigi only

type	2P	3P	4P
5 mod.	250		
9 mod.		410	450
11 mod.		750	800

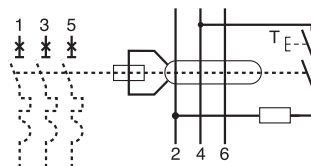
- connection:
 - $\leq$ 63 A ratings: tunnel terminals for 1.5 to 50 mm² copper cables
 - 80 to 125 A ratings: tunnel terminals for 16 to 70 mm² copper cables
 - aluminium cables, copper cables with lug (see connection accessories).

catalogue numbers

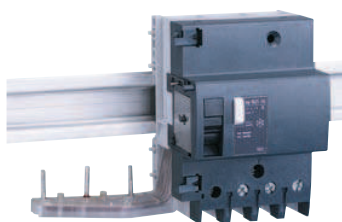
type	rating $\leq$ (A)	sensitivity (mA)	catalogue numbers	width in mod. of 9 mm
AC class ~				
2P	63	300	19001	5



3P	63	300	19003	9
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18596



19003

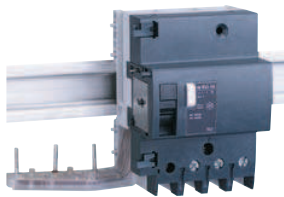
catalogue numbers

type	rating ≤ sensitivity		catalogue numbers	width in mod. of 9 mm
	(A)	(mA)		
AC class ~ (continued)				
4P	63	300	19005	9
A class ~				
2P	63	300	19012	5
		300	19009 (1)	5
		300 [S]	19030	5
		1000 [S]	19031	5
3P	63	300	19014	9
		300 [S]	19032	9
		1000 [S]	19033	9
		300...3000 I/S/R	19036	11
		300...3000 I/S/R	19053 (2)	11
	125	300...1000 I/S	19044	11
		300...3000 I/S/R	19047	11
		300...3000 I/S/R	19055 (2)	11
4P	63	300	19016	9
		300 [S]	19034	9
		1000 [S]	19035	9
		300...3000 I/S/R	19037	11
		300...3000 I/S/R	19054 (2)	11
	125	30	19040	11
		300	19042	11
		300 [S]	19043	11
		300...1000 I/S	19046	11
		300...3000 I/S/R	19049	11
		300...3000 I/S	19056 (2)	11
"si" type ~				
3P	125	300...3000 I/S/R	19106	11
4P	125	300...3000 I/S/R	19107	11

(1) voltage rating: 110...220 V AC

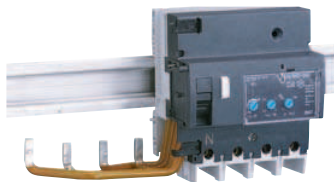
(2) voltage rating: 440...500 V AC, without early warning function

05-4393



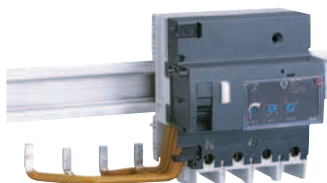
19033

05-4385



19049

05-7484



19107

Multipolar Protection

Circuit protection breakers

C60H-DC

C curve



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

IEC / EN 60947-2



UL1077

(Supplementary Protector TC 3)



GB 14048.2

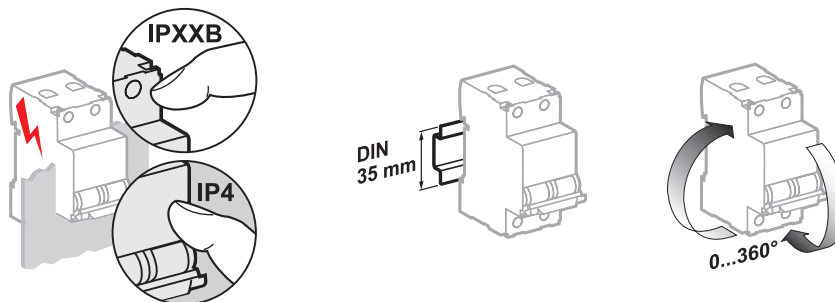
Catalogue numbers				
Operating voltage	12...250 V DC		12...500 V DC	
Rated voltage	250 V DC		500 V DC	
Number of poles	1P		2P	
Curve	C		C	
Number of modules of 9 mm	2		4	
Diagrams	 Supply from above or below, observing the polarity		 Supply from above Supply from below	
Standards	UL1077	IEC 60947-2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

* At 25°C / 77°F see temperature derating module 92515.

Technical data

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

Electrical technical data		
Rated service breaking capacity (Ics)		75 % of the ultimate breaking capacity (Icu)
Power loss		see module 92517
Magnetic tripping (Ii)		8.5 In (± 20 %) (compatible with curve C)
Impulse voltage (Uimp)		6 kV
Endurance (O-C)		
Electrical		■ 3,000 cycles (where L/R=2 ms) ■ 6,000 cycles where the circuit is resistive
Mechanical		20,000 cycles
Complementary technical data		
Degree of pollution		3
Category		A (no delay in accordance with IEC / EN 60947-2 standards)
Weight	1P	128 g / 4.51 oz
	2P	256 g / 9.03 oz
Environment		
Tropicalisation		Relative humidity: 95 % at 55°C / 131°F in accordance with IEC 60068-2 and GB 14048.2 standards
Temperature	Operating	-25°C to 70 °C / -13°F to 158°F
	Storage	-40°C to 85°C / -40°F to 185°F



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

Multipolar Protection

Circuit protection

breakers

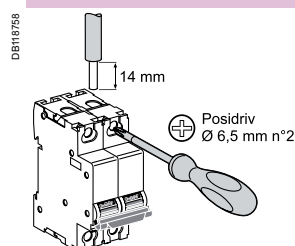
C60H-DC

C curve



C60 accessories

Connection



Rating	Tightening torque	Without accessory			With connection accessories					
		Copper cables UL 486A file no. #E216919			Terminal Al / Cu	Ring tongue terminal screw connection	Insulated distribution terminal			
		rigids	flexibles	with end piece			rigid cables	flexible cables		
		DB112804	DB110754	DB110753	DB110755		DB110756		DB110757	
										
≤ 25 A	2.5 N.m / 22 lb.in	2.5 to 25 mm² #14 - #4 AWG	2.5 to 16 mm² #14 - #6 AWG		50 mm² / 1 AWG	Ø 5 mm	3 x 16 mm² 3 x 6 AWG	3 x 10 mm² 3 x 8 AWG		
> 25 A	3.5 N.m / 31 lb.in	2.5 to 35 mm² #14 - #2 AWG	2.5 to 25 mm² #14 - #4 AWG		-					

1	Insulated connector	(see module 91906)
2	Comb busbar	(see module 91906)
3	Terminal 50 mm ² Al / Cu	27060
4	Ring tongue terminal screw connection	27053
5	Ring tongue terminal connections kit Ø 5 mm, (upstream/downstream)	17400
6	Insulated distribution terminal	4 pieces 19091 3 pieces 19096

Assembly

7	Sealable terminal shield	26976
8	Inter-pole barrier	27001
9	Rotary handle	
	Switching sub-assembly	27046
	Disconnectable handle	27047
	Fixed handle	27048
10	Screw shield	26981
11	Padlocking accessory (to be locked in the "open" position)	26970
12	Spacer	27062
13	Dividable mounting plate	26996
14	Marker strip	(see module 91900)

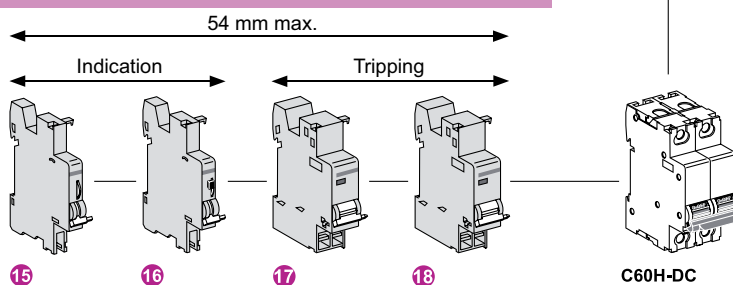
C60 auxiliaries (see modules 90081 - 91103)

Indication

- 15 SD fault indicating switch
- 16 OF open/closed contact

Tripping

- 17 MN undervoltage release
- 18 MX + OF shunt release



- The electrical auxiliaries must be installed to the left of the circuit breaker and within a width of 54 mm.
- If the auxiliary SD contacts are associated with the tripping auxiliaries (MN, MX, etc.), they must be installed to the left of these auxiliaries.

Multipolar Protection Circuit protection breakers

C60NA-DC



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FB105203-50



The C60NA-DC is a DC switch disconnecter dedicated to array isolation and control in photovoltaic installation with Voc until 650 V DC.

Associated with string protections devices (eg: C60PV-DC) it shall be installed in the array box (see application diagram).

It isolates the PV field connected at the array to the rest of the PV field to allow maintenance on PV string and PV string protections (eg: C60PV-DC or fuses).

It can be padlocked in off position to guarantee safety interventions.

As fault current may flow in opposite direction of normal operating current, C60NA-DC is able to switch multi directionnal current.

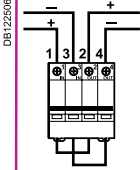
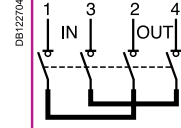
C60NA-DC is not polarity sensitive: (+) and (-) wires can inversed without any risk.

The C60NA-DC is:

- compatible with C60 auxiliaries (MN, MX, OF, SD)
- delivered with three inter-pole barrier to provide increased isolation distance between two adjacent connectors.

IEC / EN 60947-3



Main characteristics	
Operating voltage (Ue)	20 A: 650 V DC
	30 A: 500 V DC
	40 A: 400 V DC
	50 A: 300 V DC
	1,000 V DC
Rated insulation voltage (Ui)	1,000 V DC
Rated operational current (Ie)	50 A
Impulse voltage (Uimp)	6 kV
Electrical connection	By the top for In and Out
Number of poles	2P
Number of modules of 9 mm	8
Diagrams	 
Standards	IEC 60947-3 EN 60947-3
Catalogue number	MGN61690

Additional characteristics			
Rating (A)	Voltage drop (mV)	Impedance (mΩ)	Power loss (W)
20 A	100	5.02	2
30 A	151	5.02	4.53
40 A	201	5.02	8.04
60 A	251	5.02	12.55

Technical data

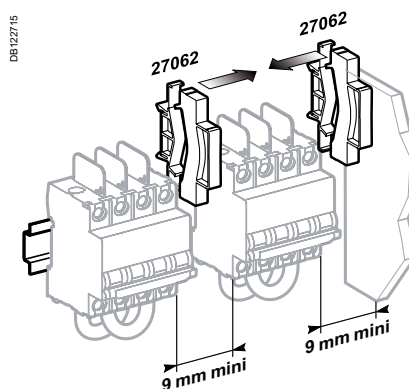
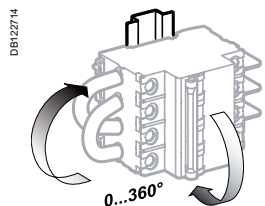
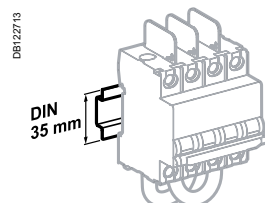
- Position contact indication - suitability for isolation according to IEC/EN 60947-3 standard.
- The presence of the green strip guarantees physical opening of the contacts and allows operations to be performed on the downstream circuit in complete safety.
- Increased product service life thanks to fast closing independent of the speed of actuation of the toggle.
- Pre-wired product: Input / Output on the same side.

Endurance (O-C)	
Electrical	1,500 cycles
Mechanical	20,000 cycles
Complementary technical data	
Degree of pollution	2
Category	DC21A
Weight	530 g / 18.69 oz
Environment	
Tropicalisation	Relative humidity: 95 % at 55°C / 131°F in accordance with IEC 60068-2 and GB 14048.2 standards
Temperature	Operating Storage
	-25°C to 70 °C / -13°F to 158°F -40°C to 85°C / -40°F to 185°F



Moreover it is recommended to use:

- a terminal Screw Shield snaps onto the front of the C60NA-DC protective devices to provide greater insulation of the terminal screws
- a Spacer clips 9 mm in each side to provide isolation.



Required to have a 9 mm space isolation in each side

Multipolar Protection Circuit protection breakers

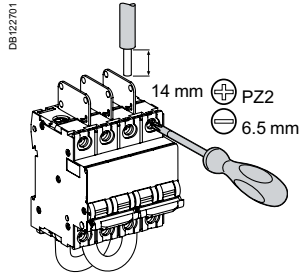
C60NA-DC



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Connection

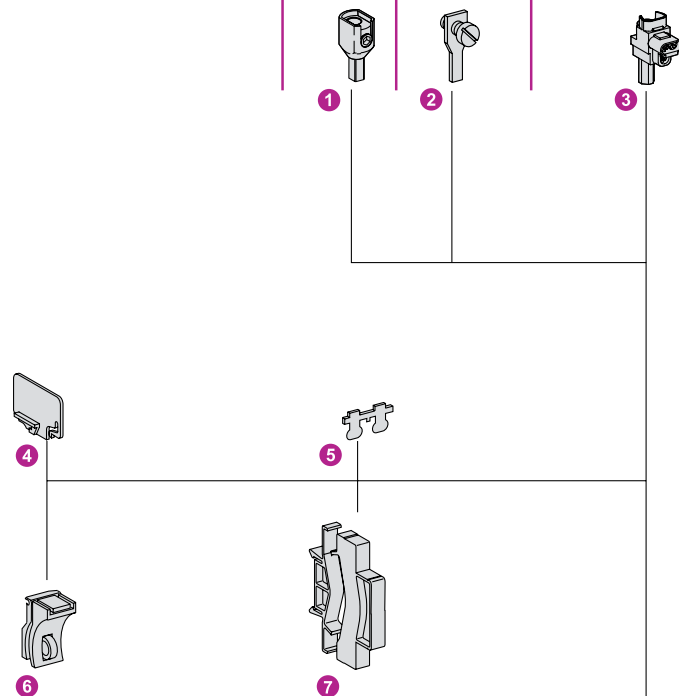


Rating		Without accessory		With accessories		Multi-cables terminal	
		Copper cables UL 486A file no. #E216919		50 mm ² Cu/Al Terminal	Screw on connection for ring terminal	Rigid cables	Flexible cables
		Rigids	Flexibles with ferrule				
		DB112804	DB112805	DB118755	DB118756	DB118757	
50 A	3.5 N.m	1 to 35 mm ²	1 to 25 mm ²	50 mm ²	Ø 5 mm	3 x 16 mm ²	3 x 10 mm ²

1	Terminal 50 mm² Al / Cu	27060	
2	Ring tongue terminal screw connection	27053	
3	Insulated distribution terminal	4 pieces	19091
		3 pieces	19096

Assembly

4	Inter-pole barrier	27001
5	Screw shield	26981
6	Padlocking accessory (to be locked in the "open" position)	26970
7	Spacer	27062



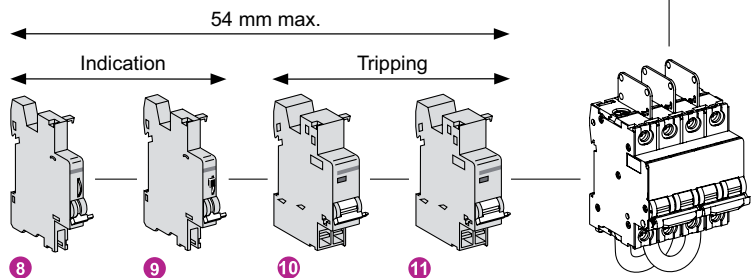
C60 auxiliaries (see modules 90081 - 91103)

Indication

- 8 SD fault indicating switch
- 9 OF open/closed contact

Tripping

- 10 MN undervoltage release
- 11 MX + OF shunt release



The electrical auxiliaries must be installed to the left of the circuit breaker and within a width of 54 mm.
If the auxiliary SD contacts are associated with the tripping auxiliaries (MN, MX, etc.), they must be installed to the left of these auxiliaries.

Multipolar Protection

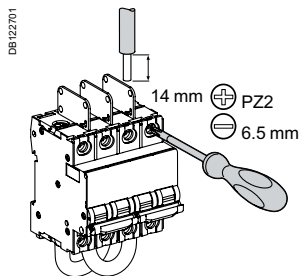
Circuit protection

breakers

C60NA-DC



Connection

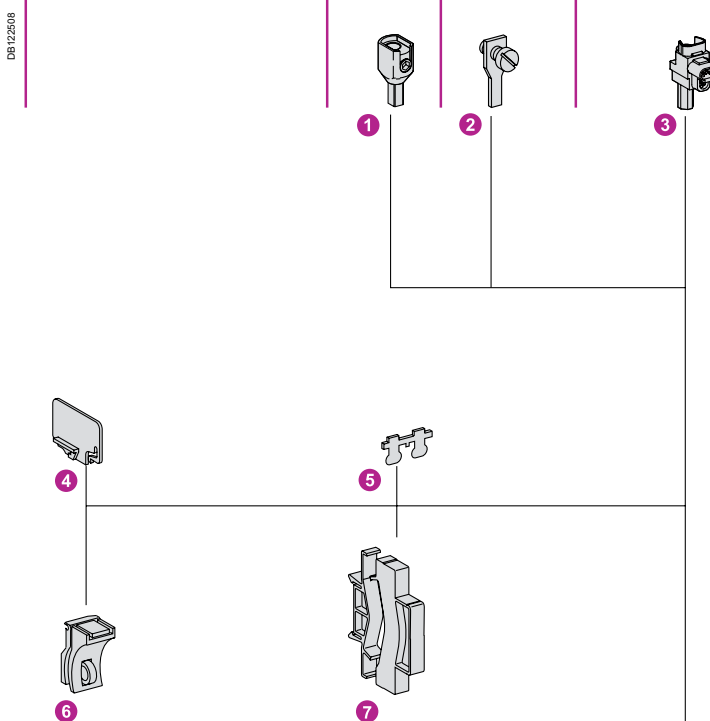


Rating	Tightening torque	Without accessory		With accessories		Multi-cables terminal	
		Copper cables UL 486A file no. #E216919		50 mm ² Cu/Al Terminal	screw on connection for ring terminal	Rigid cables	Flexible cables
		Rigids	Flexibles with ferrule				
		DB112804	DB112805	DB118755	DB118756	DB118757	
50A	3.5 N.m	1 to 35 mm ²	1 to 25 mm ²	50 mm ²	Ø 5 mm	3 x 16 mm ²	3 x 10 mm ²

1	Terminal 50 mm ² Al / Cu	27060
2	Ring tongue terminal screw connection	27053
3	Insulated distribution terminal	4 pieces 19091
	3 pieces	19096

Assembly

4	Inter-pole barrier	27001
5	Screw shield	26981
6	Padlocking accessory (to be locked in the "open" position)	26970
7	Spacer	27062



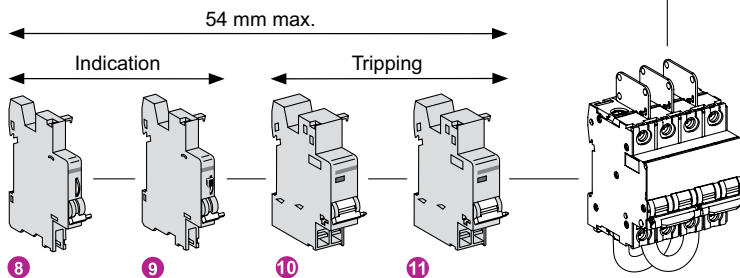
C60 auxiliaries (see modules 90081 - 91103)

Indication

- 8 SD fault indicating switch
- 9 OF open/closed contact

Tripping

- 10 MN undervoltage release
- 11 MX + OF shunt release



Multipolar Protection Circuit protection breakers

C60PV-DC C curve



A
I

PS1 05290-50



The C60PV-DC is a DC circuit breaker dedicated to multi string photovoltaic installations with V_{oc} until 650 V DC.

Associated with junction box switch (eg: C60NA-DC), C60PV-DC shall be installed in the end of each PV strings. It isolates PV string and protect it from reverse fault current (see application diagram). It can be padlocked in off position to guarantee safety in case of inverter removal (see C60 accessories).

As fault current may flow in opposite direction of normal operating current, C60PV-DC is able to detect and protect any bidirectional current.

C60PV-DC is not polarity sensitive: (+) and (-) wires can be reversed without any risk.

The C60PV-DC is:

- compatible with C60 auxiliaries (MN, MX, OF, SD)
- delivered with three inter-pole barriers to provide increased isolation distance between two adjacent connectors.

IEC / EN 60947-2



Main characteristics	
Operating voltage (U_e)	650 V DC
Rated insulation voltage (U_i)	1,000 V DC
Breaking capacity (I_{cu})	1.5 kA
Impulse voltage (U_{imp})	6 kV
Electrical connection	By the top for In and Out
Number of poles	2P
Curve	C
Number of modules of 9 mm	8
Diagrams	
Standards	IEC 60947-2 EN 60947-2
Rating (A)	Catalogue numbers
10	MGN61650
16	MGN61651
20	MGN61652

Additional characteristics			
Rating (A)	Voltage drop (mV)	Impedance (mΩ)	Power loss (W)
10 A	689	68.9	6.89
16 A	656	41	10.496
20 A	594	29.7	11.88

Technical data

- Tripping curves: C curve - Overcurrent protection for any
- Tripping curves: C curve - Overcurrent protection for any type of application.
 - Position contact indication - suitability for isolation according to IEC/EN 60947-2 standard.
 - The presence of the green strip guarantees physical opening of the contacts and allows operations to be performed on the downstream circuit in complete safety.
 - Increased product service life thanks to fast closing independent of the speed of actuation of the toggle.
 - Pre-wired product: Input / Output on the same side.

Electrical technical data

Rated service breaking capacity (Ics)	100 % of the Icu
Magnetic tripping (Ii)	8.5 In (± 20 %) (compatible with curve C)

Endurance (O-C)

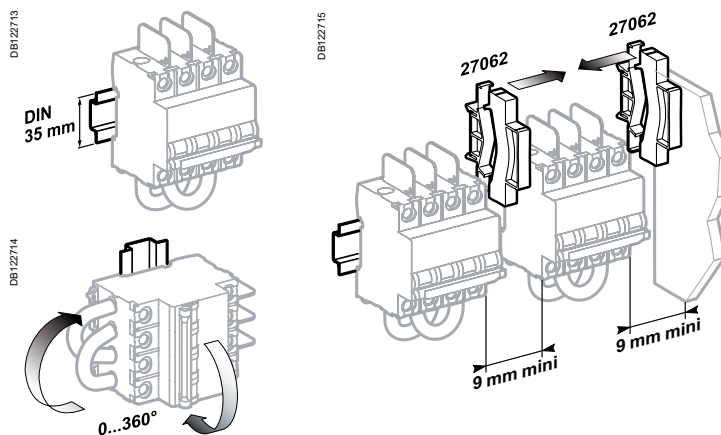
Electrical	1,500 cycles (where L/R=2 ms)
Mechanical	20,000 cycles

Complementary technical data

Degree of pollution	2
Category	A (no delay in accordance with IEC / EN 60947-2 standards)
Weight	530 g / 18.69 oz

Environment

Tropicalisation	Relative humidity: 95 % at 55°C / 131°F in accordance with IEC 60068-2 and GB 14048.2 standards
Temperature	Operating: -25°C to 70 °C / -13°F to 158°F
	Storage: -40°C to 85°C / -40°F to 185°F



Required to have a
9 mm space isolation
in each side

Multipolar Protection

Circuit protection

breakers

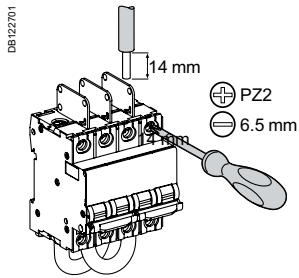
C60PV-DC

C curve



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Connection

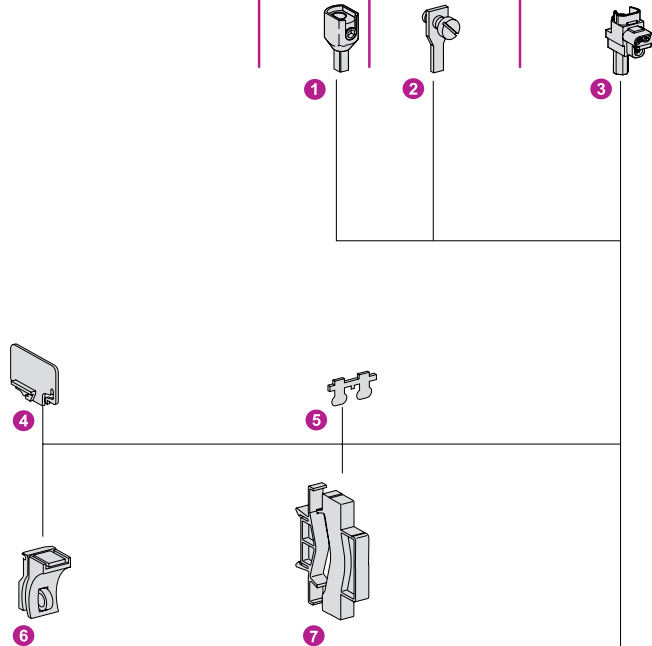


Rating	Tightening torque	Without accessory		With accessories		Multi-cables terminal	
		Copper cables UL 486A file no. #E216919		50 mm ² Cu/Al Terminal	Ring tongue terminal screw connection	Rigid cables	Flexible cables
		Rigids	Flexibles with ferrule				
		DB112804	DB112805	DB118755	DB118756	DB118757	
≤ 20 A	2.5 N.m	1 to 25 mm ²	1 to 16 mm ²	50 mm ²	Ø 5 mm	3 x 16 mm ²	3 x 10 mm ²

1	Terminal 50 mm ² Al / Cu	27060
2	Ring tongue terminal screw connection	27053
3	Insulated distribution terminal	4 pieces 19091
	3 pieces	19096

Assembly

4	Inter-pole barrier	27001
5	Screw shield	26981
6	Padlocking accessory (to be locked in the "open" position)	26970
7	Spacer	27062



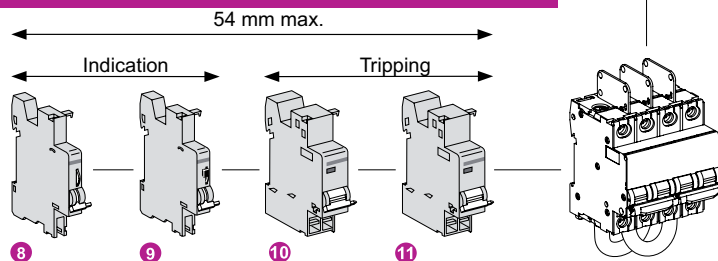
C60 auxiliaries (see modules 90081 - 91103)

Indication

- 8 SD fault indicating switch
- 9 OF open/closed contact

Tripping

- 10 MN undervoltage release
- 11 MX + OF shunt release



The electrical auxiliaries must be installed to the left of the circuit breaker and within a width of 54 mm. If the auxiliary SD contacts are associated with the tripping auxiliaries (MN, MX, etc.), they must be installed to the left of these auxiliaries.

Multipolar Protection

Circuit protection breakers

SW60-DC



The SW60-DC is a DC main switch disconnecter dedicated to main isolation and control in photovoltaic installation with V_{oc} until 1000 V DC.

Associated with string protections devices (eg: C60PV-DC) and junction box switch (eg: C60NA-DC), SW60-DC shall be installed between the PV field and the inverter (see application diagram).

It isolates the PV field to allow safe maintenance on inverter.

It can be padlocked in off position to guarantee safety in case of inverter removal (see C60 accessories).

SW60-DC is polarity sensitive: (+) and (-) has to be respected for connection.

The SW60-DC is:

- compatible with C60 auxiliaries (MN, MX, OF, SD)
- delivered with three inter-pole barrier to provide increased isolation distance between two adjacent connectors.

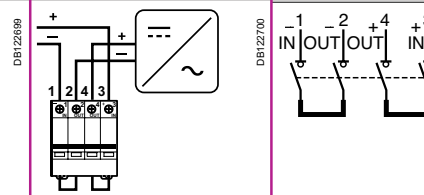
IEC / EN 60947-3



General technical data

Operating voltage (Ue)	1000 V DC
Rated insulation voltage (Ui)	1000 V DC
Rated operational current (Ie)	63 A
Impulse voltage (Uimp)	6 kV
Electrical connection	By the top for In and Out
Number of poles	2P
Number of modules of 9 mm	8

Diagrams



Standards	IEC 60947-3 EN 60947-3
Catalogue number	MGN61700

Additional characteristics

Rating (A)	Voltage drop (mV)	Impedance (mΩ)	Power loss (W)
63 A	316	5.02	19.908

Multipolar Protection Circuit protection breakers

SW60-DC



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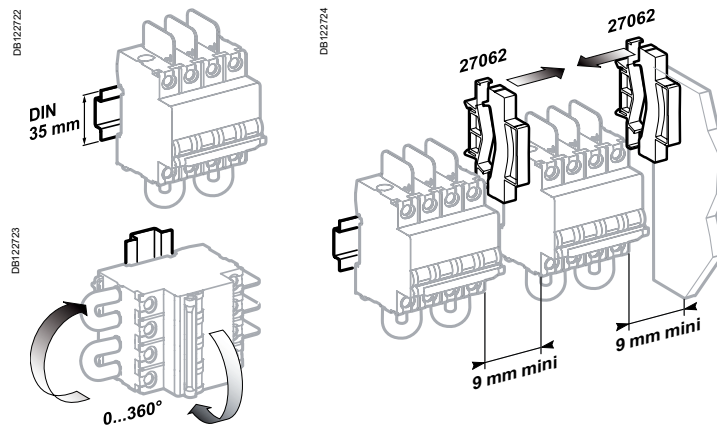
Technical data

- Position contact indication - suitability for isolation according to IEC/EN 60947-3 standard.
- The presence of the green strip guarantees physical opening of the contacts and allows operations to be performed on the downstream circuit in complete safety.
- Increased product service life thanks to fast closing independent of the speed of actuation of the toggle.
- Pre-wired product: Input / Output on the same side.

Endurance (O-C)		
Electrical		3,000 cycles
Mechanical		20,000 cycles
Complementary technical data		
Degree of pollution		2
Category		DC21A
Weight		530 g / 18.69 oz
Environment		
Tropicalisation		Relative humidity: 95 % at 55°C / 131°F in accordance with IEC 60068-2 and GB 14048.2 standards
Temperature	Operating	-25°C to 70 °C / -13°F to 158°F
	Storage	-40°C to 85°C / -40°F to 185°F

Moreover it is recommended to use:

- a terminal Screw Shield snaps onto the front of the SW60-DC protective devices to provide greater insulation of the terminal screws.
- a Spacer clips 9 mm in each side to provide isolation.



Required to have a
9 mm space isolation
in each side



Failure to match polarity during connection may lead to a fire hazard and/or serious injury.
The connection polarity must be observed (marked on the front panel).
Use only with direct current.



Multipolar Protection

Residual current circuit breakers

Residual current circuit-breaker choice tables

		RCCB-ID																	
class or type		AC					A					si				SiE			
number of poles		2P, 4P																	
voltage rating Ue (V)		2P: 230 V AC, -15...+10 % 4P: 230/400 V AC, -15...+10 %																	
current rating Ie (A)		25	40	63	80	100	16	25	40	63	80	100	25	40	63	80	25	40	63
sensitivity (mA)		□					□					□				□			
10		■					■					■				■			
30		■					■					■				■			
100		■					■					■				■			
300		■					■					■				■			
500		■					■					■				■			
100 [S]		□					□					□				□			
300 [S]		■					■					■				■			
500 [S]		■					■					■				■			
operating temperature		-5...+40 °C					-25...+40 °C												
storage temperature		-40...+60 °C																	
protected against supply overvoltages		max.: Ue +10 %																	
permanent value		50/60 Hz												50 Hz					
operating frequency																			
electrical withstand (IEC)		61008 61009																	
insulation resistance (IEC)		61008 - 61009 61000-8 - 61000-9																	
tunnel terminals tight. torque		3.5 N.m																	
entry dimension		8 mm																	
pull-out withstand		100 N																	
self-extinguishing (as in IEC 60695-2-1)		960 °C, 30 s on the insulated parts linked to a potential 650 °C, 30 s on the insulated parts not linked to a potential as in IEC 61008																	
humid heat																			
auxiliaries		OF.S + MN, MN[S], MX+OF, OF, SD, OF+SD/OF, MNx, MSU																	
min. operating threshold for the PB test		115 VAC																	

□ 2P ■ 2P, 4P x 4P

Multipolar Protection

Residual current

circuit breakers

Residual current circuit-breaker

choice tables

A

II

	RCCB-ID	RCCB-ID 100/125A						
class or type	B type (no auxiliaries)	AC		A			si	
number of poles	4P	2P, 4P						
voltage rating Ue (V)	230/400, -15...+10 %	2P: 230 V AC, +10 % 4P: 230/400 V AC, +10 %						
current rating Ie (A)	63	100	125	80	100	125	100	125
sensitivity (mA)	10							
	30	x	■	x	■	■	x	■
	100	x	x					
	300	x	■		■	■	x	■
	500	x			x	x		
	100 							
	300 			x				
	500 							
operating temperature	-25...+40 °C	-25...+40 °C						
storage temperature	-40...+60 °C							
protected against supply overvoltages	max.: Ue +10 %							
permanent value	50 Hz							
operational frequency								
electrical withstand (IEC)	61008 61009							
insulation resistance (IEC)	61008 - 61009 61000-8 - 61000-9							
tunnel terminals tight. torque	3.5 N.m	3 N.m						
entry dimension	8 mm							
pull-out withstand	100 N							
self-extinguishing	960 °C, 30 s on the insulated parts linked to a potential							
(as in IEC 60695-2-1)	650 °C, 30 s on the insulated parts not linked to a potential							
humid heat	as in IEC 61008							
auxiliaries	none	OFsp						
min. operating threshold for the PB test	115 V AC	2P: 100 V AC 4P: 185 V AC						

■ 2P, 4P x 4P

Level relative to the electromagnetical compatibility of RCDs

test (IEC 61543)	required normative level	test verdict	required internal level			
			instantan. RCD AC, A, B classes	[S] type RCD AC, A, B classes	instantan. RCD "si" and "siE" types	DDR type [S] "si" and "siE" types
voltage impulse: 1.2/50 μ s earth leakage mode: common mode: (T2.3)	(IEC 61000-4-5) 4 kV under 2 Ω 5 kV under 2 Ω	5.1.2	5 kV 8 kV	5 kV 8 kV	5 kV 8 kV	5 kV 8 kV
rapid transient in bursts (T2.2)	(IEC 61000-4-4) 4 kV	5.1.2	4 kV	4 kV	4 kV	4 kV
sinusoidal wave absorbed by the current (T2.4)	(IEC 61008-61009) 200 A	5.1.4	200 A	400 A	400 A	400 A
current impulse 8/20 μ s	(IEC 61008-61009) for [S] type only:	5.1.2		3 kA 10 kA	1.5 kA	5 kA > 200 A
current impulse 10 / 1000 μ s electrostatic discharge (T3.1)	(IEC 61000-4-2) in the air: 8 kV at contact: 6 kV	5.1.3	8 kV 6 kV	8 kV 6 kV	8 kV 6 kV	8 kV 6 kV

Test verdict:

5.1.1: non tripping during the test under 0.3 IDn stacked and tripping during the test under 1.25 IDn stacked

5.1.2: non-tripping during the test, after the tripping test under IDn

5.1.3: tripping is possible during the test, after the tripping test under IDn

5.1.4: see IEC 61008/61009

Multipolar Protection

Residual current circuit breakers

A and AC class, “si” and “SiE” type RCCB-ID 10 mA, 30 mA, 100 mA, 300 mA and 500 mA instantaneous 100 mA^S, 300 mA^S, 500 mA^S

function

Residual current circuit-breakers ensure:

- the control and isolation of electrical circuits
- the protection of persons against direct and indirect contacts
- the protection of installations against insulation faults.

They conform to both the residual current device standard IEC 61008 and to switch standards IEC 60947-1 and IEC 60947-3.

Residual current circuit-breakers are used in the housing, tertiary and industrial sectors.

AC class

Tripping is ensured for sinusoidal, alternative currents, whether they are quickly applied or slowly increased.

A class

Tripping is ensured for sinusoidal, alternating residual as well as for pulsed DC residual currents, whether they are quickly applied or slowly increased.

Application: loads with electronics, rectifiers, instruments.

“si” type

Reinforced continuity of supply on disturbed networks with:

- a high risk of nuisance tripping:
 - successive lightning strokes
 - IT earthing system
 - variable speed controllers, frequency converters
 - presence of electronic ballasts
 - presence of switchgear that incorporates interference filters i.e. lighting, micro-computing, etc.
- sources of blinding:
 - presence of harmonics or high frequency rejection
 - presence of DC components: diodes, thyristors, triacs
 - low temperature.

“SiE” type

The RCCB/ID “SiE” types are particularly suitable for use in humid environments and/or environments polluted by aggressive agents, for example swimming pools, marinas, the food-processing industry, water treatment plants, industrial sites.

They also incorporate RCCB/ID “si” functions.

Instantaneous

It ensures instantaneous tripping (not time-delay).

Selective ^S

Total discrimination can be achieved using a non-selective residual current device placed downstream.

description

The residual current trip unit is electromechanical. It functions without an auxiliary source.

Technical data

- voltage rating:
 - 230...400 V AC, -15...+10 %
- frequency rating:
 - AC and A classes: 50/60 Hz
 - “si” and “SiE” types: 50 Hz
- current rating (Ith) at 40 °C: 16...100 A
- as in IEC 61008:
 - breaking and making capacity:
 - rated residual (IΔm): 2.5 kA
 - rated (Im): 1.5 kA
- as in IEC 60947-3:
 - isolation with positive break indication, opening is indicated by a green strip on the device operating handle. This indicator shows that all poles are open.
 - rated impulse with stand
 - voltage (Uimp): 6 kV
 - insulation voltage (Ui): 440 V
 - utilization category:
 - AC 23A rating ≤ 63 A
 - AC 22B ratings 80 and 100 A

Multipolar Protection Residual current circuit breakers

A and AC class, "si" and "SiE" type RCCB-ID 10 mA, 30 mA, 100 mA, 300 mA and 500 mA instantaneous 100 mA[S], 300 mA[S], 500 mA[S]

A

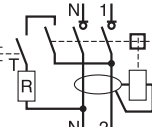
II

- padlocking in the "tripped" position is possible using the padlocking device (not supplied) (see page A75)
- protected against nuisance tripping due to transient overvoltages (lightning, switchgear operation on the network, etc.)
- impulse withstand level 8/20 μ s:
- AC and A classes:
 - 250 A for instantaneous
 - 3 kA for [S]
- "si" and "SiE" type:
 - 3 kA for instantaneous
 - 5 kA for [S]
- short-circuit current withstand ($I_{\Delta c} = I_{nc}$): 10 kA with 100 A fuse upstream
- number of operations (O-C): 20 000
- trip units with fixed sensitivities for all ratings:
- instantaneous trip unit
- selective trip unit: total vertical selectivity can be achieved using 30 mA residual current devices placed downstream
- indication:
 - mechanical: earth fault indication on front panel by means of a mechanical indicator
 - electrical: using auxiliaries (see page A70-A73)
- remote tripping: using auxiliaries (see page A70-A73)
- environment:
 - tropicalisation: treatment 2 (relative humidity 95 % at 55 °C)
 - operating temperature:
 - AC class: -5...+40°C
 - A class, "si" and "SiE" type: -25...+40°C
 - storage temperature: -40...+60°C
 - weight (g):

- connection using tunnel terminals for flexible 35 mm² cable or rigid 50 mm² cable
- can be directly connected using comb busbars on 2P residual current circuit-breakers
- conform with standards:
 - IEC 61008
 - IEC 60947-1
 - IEC 60947-3.

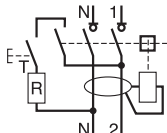
type	2P	4P
	230	450

catalogue numbers

type	voltage (VAC)	rating (A)	sensitivity (mA)	catalogue number	width in mod. of 9 mm	
AC class RCCB-ID residual current circuit-breakers				EN 61008 230 V	BSEN 61008 240 V	
	230	16	10	-	23081	4
		25	10	23008	16200	4
		40	30	23009	16201	4
			300	23011	16202	4
			30	23014	16204	4
			100	23015	16205	4
			300	23016	16206	4
		63	500	23017	-	4
			30	23018	16208	4
			100	-	16209	4
			300	23021	16210	4
			300 [S]	23028	-	4
		80	500	23022	-	4
			500 [S]	23029	-	4
			30	23020	16212	4
			100	-	16213	4
			100 [S]	-	23111	4
		100	300	23030	16214	4
			300 [S]	23032	-	4
			500	23026	-	4
500 [S]	23033		-	4		
30	-		23101	4		
100	-		23102	4		
300	23034		23103	4		
300 [S]	23035	23116	4			



23011



Multipolar Protection

Residual current circuit breakers

A and AC class, "si" and "SiE"
type RCCB-ID 10 mA, 30 mA, 100 mA,
 300 mA and 500 mA instantaneous 100
 mA^[S], 300 mA^[S], 500 mA^[S]

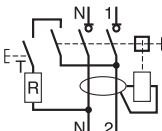
catalogue numbers

type	voltage (V CA)	rating (A)	sensitivity (mA)
------	-------------------	---------------	---------------------

catalogue number	width in mod. of 9 mm
EN 61008 230 V	BSEN 61008 240 V

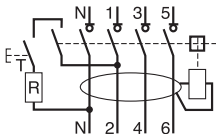
"si" type RCCB-ID residual current circuit-breakers

2P	230	25	30
		40	30
		63	30
			300 ^[S]
		80	300 ^[S]



23523	16234	4
23524	16237	4
23525	16240	4
23363	16246	4
23372	16247	4

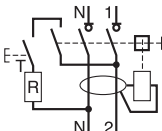
4P	230/400	25	30
		40	30
		63	30
			300 ^[S]
		80	30



23526	16321	8
23529	16324	8
23530	16327	8
23392	16334	8
23390	-	8
23394	16335	8

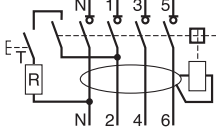
"SiE" type RCCB-ID residual current circuit-breakers

2P	230	25	30
		40	30
			300 ^[S]
		63	30
			300 ^[S]



23300	-	4
23307	-	4
23314	-	4
23352	-	4
23355	-	4

4P	230/400	25	30
		40	30
			300 ^[S]
		63	30
			300 ^[S]



23377	-	8
23379	-	8
23398	-	8
23383	-	8
23401	-	8



23525

05/420



23530

PB 10/0002



23355

PB 10/0003



23383

Multipolar Protection Residual current circuit breakers

A and AC class, "si" and "SiE" type RCCB-ID 10 mA, 30 mA, 100 mA, 300 mA and 500 mA instantaneous 100 mA[S], 300 mA[S], 500 mA[S]

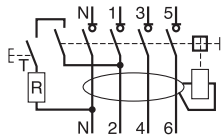
A
II

catalogue numbers

type	voltage (V CA)	rating (A)	sensitivity (mA)	catalogue number	width in mod. of 9 mm
				EN 61008 400 V	BS EN 61008 415 V

AC class RCCB-ID residual current circuit-breakers

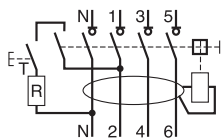
4P	230/400	25	30	23038	16251	8
			300	23040	16252	8
		40	30	23042	16254	8
			100	15176	16255	8
			300	23045	16256	8
			300 [S]	23062	-	8
			500	23046	-	8
			500 [S]	23063	-	8
		63	30	23047	16258	8
			100	15177	16259	8
			300	23049	16260	8
			300 [S]	23066	16265	8
			500	23051	-	8
			500 [S]	23067	-	8
		80	30	23061	16261	8
			300	23054	16263	8
			300 [S]	23069	16266	8
			500	23055	-	8
			500 [S]	23070	-	8
			100	23056	-	8
			300	23059	-	8
			300 [S]			



23049

A class RCCB-ID residual current circuit-breakers

2P	230	16	10	23415		4
			25	23353		4
			30	23354		4
			300	23356		4
		40	30	23358		4
			300	23360		4
			300 [S]	23265		4
			30	23362		4
		63	300	23364		4
			300 [S]	23370		4
			500 [S]	23371		4
			80	23272		4
		100	300 [S]	23279		4
4P	230/400	25	30	23378		8
			300	23380		8
			500	23381		8
			30	23382		8
		40	100	23304		8
			100 [S]	23490		8
			300	23384		8
			300 [S]	23399		8
			500	23385		8
			30	23386		8
		63	100 [S]	23494		8
			300	23388		8
			300 [S]	23402		8
			500	23389		8
		80	300	23326		8
			300 [S]	23284		8
			500 [S]	23376		8
			100	23294		8
			300 [S]			



additional
information

auxiliaries: page A81 to A84
accessories: page A85-A86
dimensions: page A110

Multipolar Protection

Residual current circuit breakers

RCCB-ID 100 / 125 A

AC and A class, "si" type

30 mA, 100 mA, 300 mA and 500 mA instantaneous, 300 mA 



16973



16921



16940



16938



16939

function

The residual current circuit-breakers are used to:

- control electric circuits
- protect people against direct and indirect contacts
- protect installations against insulation faults.

The residual current circuit-breakers are used in the tertiary sector and industry

AC class

Tripping is ensured for slowly increasing sinusoidal AC residual currents, whether applied suddenly or increasing slowly.

A class

Tripping is ensured for sinusoidal AC residual currents and for pulsed DC residual currents, whether applied suddenly or increasing slowly.

"si" type

This type monitors circuits while ensuring tripping and enhancing both continuity of supply and safety.

- It is used for pulsed DC component currents:
 - applied suddenly
 - varying progressively.
- It is recommended for use in environments disturbed by:
 - extreme atmospheric conditions
 - harmonic generating loads.

Instantaneous

It ensures instantaneous tripping (not time-delay).

Selective

It ensures total discrimination with a non-selective RCD placed downstream.

Technical data

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

- Voltage rating:
 - 2P: 230 V AC, +10 %, -15 %.
 - 4P: 230/400 V AC, +10 %, -15 %.
- Frequency rating: 50 Hz.
- Current rating (I_n): 80, 100 or 125 A
- Making and breaking capacity, rated residual current (I_{Δm}=I_m) as per standard IEC 61008: 10 I_n.
- Protected against nuisance tripping due to transient overvoltages (lightning stroke, device switching on the network, etc.).
- Level of immunity in 8/20 μs wave:
 - AC and A class:
 - 250 A for instantaneous
 - 3 kA for 
 - "si" type: 3 kA
- Tripping time at:
 - I_{Δn}: ≤ 300 ms
 - 5I_{Δn}: ≤ 40 ms.
- Short-circuit current withstand (I_{Δc}=I_{nc}): see the circuit-breaker or fuse coordination table with RCCB-ID.
- Number of operating cycles (O-C):
 - mechanical: > 5 000
 - electrical: > 2 000.
- Releases with fixed sensitivities for all ratings:
 - instantaneous release
 - selective release: allows total vertical discrimination with the 30 mA residual current devices placed downstream.
- Test button used to check proper operation of the tripping mechanism.
- Indication of RCCB-ID status by 3-position toggle and mechanical indicator on the front face:
 - closed (red indicator)
 - tripped on fault (green indicator)
 - open (green indicator).
- Environment :
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C)
 - operating temperature: +25°C to +40°C
 - storage temperature: -40°C to +60°C.
- Weight (g):
 - 2P: 230
 - 4P: 420.

Multipolar Protection Residual current circuit breakers

RCCB-ID 100 / 125 A AC and A class, "si" type 30 mA, 100 mA, 300 mA and 500 mA instantaneous, 300 mA S

A

II

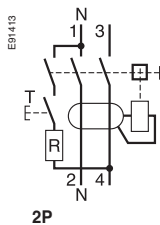
- Connection:
 - by tunnel terminal for flexible or rigid cable:
 - 1x1.5 to 50 mm²
 - 2x1.5 to 16 mm².
- Degree of protection:
 - IP40 on front face
 - IP20 at terminals.
- **Complies with standards:**
 - IEC 61008/EN 61008
 - VDE 0664.
- **OFsp auxiliary**
 - Electrical indication: by OFsp auxiliary mounted to the left. kt has a double changeover switch indicating the "open" or "closed" position of the RCCB-ID 100/125A
 - Weight (g): 40.
 - Connection: by tunnel terminal for 0.5 to 1.5 mm² cable.
- **Accessories**
 - 2P and 4P sealable screw shield:
 - prevents all contact with device terminal screws, degree of protection IP40
 - optional sealing.

Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Width in mod. of 9 mm	Cat. no.	
RCCB-ID special residual current circuit breakers, AC class						
2P	230	125	30	4	16966	
			300	4	16967	
4P	230/400	100	30	8	16900	
			100	8	16901	
		125	30	8	16905	
			100	8	16906	
			300	8	16907	
			500	8	16908	
RCCB-ID special residual current circuit breakers, A class						
2P	230	100	30	4	16968	
			300	4	16969	
		125	30	4	16970	
			300	4	16971	
4P	230/400	80	30	8	16909	
			30	8	16910	
		100	300	8	16911	
			500	8	16912	
			125	30	8	16924
				300	8	16926
				300S	8	16925
				500	8	16927
RCCB-ID special residual current circuit breakers, “si” type						
2P	230	125	30	4	16972	
			300	4	16973	
4P	230/400	100	30	8	16915	
			300	8	16916	
		125	30	8	16920	
			300	8	16921	
Type	Voltage (V AC)		Contact (A)	Width in mod. of 9 mm	Cat. no.	
OFsp auxiliary switch						
	230 V AC (AC15)		6	1	16940	
	230 V DC (DC13)		1			
Type				Number of pole	Cat. no.	
Accessories						
Screw shield (set of 10) upstream / downstream				2	16938	
				4	16939	



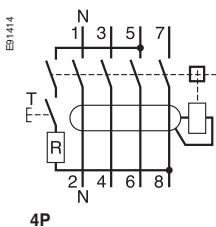
16973



2P



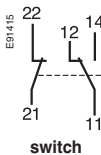
16921



4P



16940



switch



16938



16939

additional
information

dimensions: page A110

Multipolar Protection

Residual current circuit breakers

RCCB-ID 25...125 A

B type

30 mA, 300 mA

and 500 mA instantaneous, 300 mA 

Protection of people against direct and indirect contacts.

Protection of installations against insulation faults.

Control and isolation of on-load electrical circuits already protected against overloads and short-circuits.



16766

Description

B type

The RCCB-ID B type residual current circuit-breakers provide specific protection of three-phase installations and people even in the presence of DC fault currents on the network generated by:

- three-phase controllers and variable speed drives
- three-phase battery chargers and inverters
- three-phase backed-up power supplies.

They are a requirement for three-phase supplied applications, when class I equipment installed downstream from the RCCB-ID are likely to produce DC component fault currents (pure DC fault)  .

They include and also guarantee protection against fault currents:

- sinusoidal AC residual currents  (AC type)
- pulsed DC residual currents  (A type).

They can be adapted, without exception, to all the application cases defined in standards IEC 60364 and EN 50178.

The B type RCCB-ID combination with variable speed drives of the Telemecanique brand has been successfully tested and validated.

Instantaneous

It ensures instantaneous tripping (without time delay).

Selective

It ensures total discrimination with a non-selective RCD placed downstream.

RCCB-ID 25...125 A, B type

Technical data

Compliance with standards	IEC 61008, EN 61008, VDE 0664
Voltage rating	230/400 V AC, +10%, -15%
Frequency rating	50 Hz
Current rating (In)	25, 40, 63, 80 or 125 A
Making and breaking capacity, rated residual current (I _{Δn} = I _m) as per standard IEC 61008	10 In with 500 A minimum
Protected against nuisance tripping due to transient overvoltages (lightning stroke, device switching on the network, etc.)	
Level of immunity in 8/20 μs wave	3 kA
Tripping time	I _{Δn} : ≤300 ms 5I _{Δn} : ≤40 ms
Short-circuit current withstand (I _{Δc} = I _{nc})	See the circuit-breaker or fuse coordination table with B type RCCB-ID (page A57)
Number of operating cycles (O-C)	Mechanical: > 5 000 Electrical: > 2 000
Releases with fixed sensitivities for all ratings	Instantaneous release Selective release  : allows total vertical discrimination with the 30 mA RCDs placed downstream
Test button	Checks proper operation of the tripping mechanism Working range: 185...440 V AC
Indication of RCCB-ID status	By 3-position toggle and mechanical indicator on the front face: closed (red indicator) tripped on fault (red indicator) open (green indicator) By OFsp auxiliary switch (optional)
Tropicalisation	Treatment 2 (relative humidity 95% at 55°C)
Operating temperature	-25°C to +40°C
Storage temperature	-40°C to +60°C
Weight (g)	500
Degree of protection	IP40 on front face IP20 at terminals
Connection by tunnel terminal	Flexible or rigid cable: 1 x 1.5 to 50 mm² or 2 x 1.5 to 16 mm²

Multipolar Protection Residual current circuit breakers

RCCB-ID 25...125 A B type 30 mA, 300 mA and 500 mA instantaneous, 300 mA

A

II

PE101616-40-1



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062075N



16940

PB100572



16939

Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Width in mod. of 9 mm	Cat. no.
RCCB-ID residual current circuit-breakers					
4P	230/400	25	30	8	16750
			300	8	16751
			500	8	16752
		40	30	8	16753
			300	8	16754
			500	8	16755
	500	63	30	8	16756
			300	8	16757
			300	8	16758
		80	500	8	16759
			30	8	16760
			300	8	16761
	125	125	300	8	16762
			30	8	16763
			300	8	16764
			300	8	16765
			500	8	16766

OFsp auxiliary

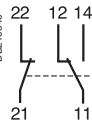
Electrical indication: by OFsp auxiliary mounted to the left. It has a double changeover switch indicating the "open" or "closed" position of the B type RCCB-ID

Weight (g) 40

Connection by tunnel terminal Flexible or rigid cable: 0.5 to 1.5 mm²

Type	Voltage (V AC)	Contact (A)	Width in mod. of 9 mm	Cat. no.
OFsp	230 V AC (AC15)	6	1	16940
	230 V DC (DC13)	1		

DB10546



Accessory

4-pole sealable screw shield	Prevents contact with device terminal screws
Degree of protection	IP40

Type	Number of poles	Cat. no.
Screw shield (set of 10 parts) upstream/downstream	4	16939

Multipolar Protection

Residual current circuit breakers

RCCB-ID 25...125 A

B type

30 mA, 300 mA

and 500 mA instantaneous, 300 mA 

Coordination tables, max. short-circuit current (kA rms)

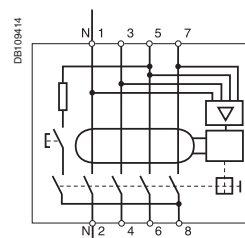
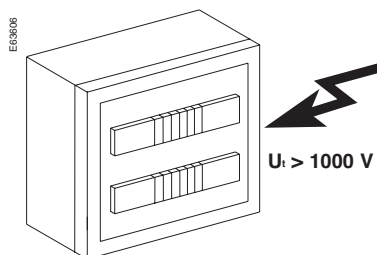
Circuit-breakers / B type RCCB-ID coordination (IEC 60947-3)

Circuit-breaker	multi 9						Compact	
	C60N	C60H	C60L	C120N	NG125N	NG125H	NS100	NS160
				C120H		NG125L		
RCCB-ID, B type								
400/415 V 25 A	10	15	25	7	15	15	4	
network 40 A	10	15	20	7	15	15	4	4
63 A	10	15	15	7	15	15	4	4
80 A				7	15	15	4	4
125 A				5	10			4

Fuses / B type RCCB-ID coordination (IEC 60947-3)

gl or gG fuse (A)	16	25	32	40	50	63	80	100	125
RCCB-ID, B type									
400/415 V 25 A	100	100							
network 40 A	100	100	100	80					
63 A	100	100	100	80	50	30			
80 A	100	100	100	80	50	30	20		
125 A	100	100	100	80	50	30	20	10	10

Dielectric test



⚠ To perform the dielectric test, disconnect terminals 3, 5, 7 and 4, 6, 8.

Multipolar Protection Residual current circuit breakers

RED, REDs, REDtest Selection table

A

II

The RED, REDs and REDtest **RE**sidual **cu**rrent **D**evice**s** offer the following functions:

- protection of people against direct and indirect contacts
- protection of installations against insulation faults
- disconnection of on-load electric circuits, already protected against overloads and short-circuits
- automatic restart after insulation monitoring of the downstream circuit
- automatic and periodical test of the device, without breaking downstream circuit (REDtest).

Selection table

Type	RED	REDs	REDtest
			
Technical data			
Earth leakage protection compliance with standards IEC 61008, EN 61008			
	■ 2P	■ 2P	■ 2P
Current rating (In)	25, 40, 63 A	25, 40, 63 A	25, 40, 63 A
Sensibility	30 mA	30, 300 mA	30, 300 mA
Type	A	A	A
Recloser			
	■	■ with prolonged insulation monitoring	■
Autotest			
	-	-	■
Power supply			
From the top	■	■	■
From the bottom	■	■	-
Indication			
Mechanical	By O-I (open-closed) 2-position lever	By O-I (open-closed) 2-position lever	By O-I (open-closed) 2-position lever
Luminous	1 LED	2 LEDs	2 LEDs
Remote	-	1 built-in auxiliary contact	1 built-in auxiliary contact

Multipolar Protection

Residual current circuit breakers

RED 25...63 A

A type - 30 mA

Protection of people against direct and indirect contacts.

Protection of installations against insulation faults.

Disconnection of on-load electric circuits, already protected against overloads and short-circuits.

Automatic restart after insulation monitoring of the downstream circuit.

PE10179-50



18681

Description

The RED, **R**esidual current **D**evice recloser, is made up of a residual current device and a recloser.

A type

The RED **phase-to-neutral** residual current devices provide **A type** earth leakage protection: tripping due to sinusoidal AC residual currents as well as by continuous pulsed residual currents, whether they are applied quickly or increased slowly.

RED 25...63 A, A type

Common technical data

Power supply	From top and bottom
Voltage rating (Ue)	230 V AC, +10 %, -15 %
Frequency rating	50 Hz
Current rating (In)	25, 40, 63 A
Impulse withstand voltage (Uimp)	4 kV
Insulation voltage (Ui)	500 V
8/20 μ s wave immunity level	250 A
Tropicalisation	Treatment 2 (relative humidity: 95 % at 55°C)
Operating temperature	-5°C to +40°C
Storage temperature	-20°C to +60°C
Weight (g)	350
Protection class	IP20 at terminals
Connection by tunnel terminal with guard	25 mm ² flexible cable or 35 mm ² rigid cable
Mounting	On DIN rail

Residual current device

Compliance with standards	IEC 61008, EN 61008
Making and breaking capacity, rated residual current (I Δ m=Im)	630 A
Breaking capacity in association with protection device	6000 A (gL 63 A)
Tripping time	I Δ n : $\leq$ 300 ms 5I Δ n : $\leq$ 40 ms
Short-circuit current withstand (I Δ c = Inc)	See coordination table of circuit-breaker or fuse with A type RED (page A60)
Number of cycles (O-C)	Mechanical: 1,000
Fixed sensitivity releases for all ratings	Instantaneous release
Test button min operating voltage	100 V

Recloser technical data

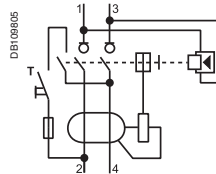
Max duration of a restart cycle	90 s
Number of restart operations	15/hour
Maximum number of consecutive restart attempts (if no earth fault)	3
Min interval between 2 closings	180 s
Insulation fault presence monitoring	Yes
Restart in event of transient insulation fault	Yes
Stopping restart cycle if insulation fault present	Yes

Indication

RED status indication	Mechanical: by O-I (open-closed) 2-position lever Electrical: by 1 red indicator light on the front panel
-----------------------	---

Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Width in mod. of 9 mm	Cat. no.
RED residual current devices					
2P	230	25	30	8	18681
		40	30	8	18683
		63	30	8	18685



Coordination table, max short-circuit current (kA rms) Multi 9 circuit-breaker, fuse / A type RED coordination

	Multi 9 circuit-breakers					Fuse
	iDPN	iDPNN	C60	C120	NG125	gL 63
RED A type						
Network 25 A	6	6	6	6	6	6
230 V 40 A	6	6	6	6	6	6
L/N 63 A	-	-	6	6	6	6

Dimensions

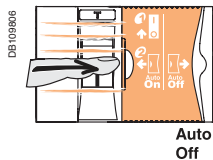


Fig. 1

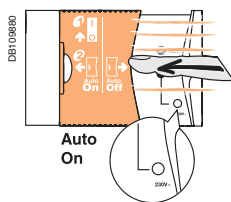
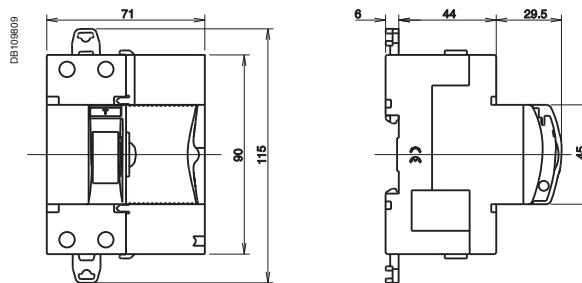


Fig. 2



Operation

Recloser

The built-in automatic recloser automatically recloses the residual current device after checking insulation of the downstream circuit. If the circuit is faulty, then RCD reclosing is prohibited.

Residual current device

The RED operates in the residual current device mode without automatic restart when the sliding cover is open, i.e. to the right in the Auto Off position (Fig. 1).

The automatic restart mode is activated when the sliding cover is closed, i.e. to the left in the Auto On position (Fig. 2).

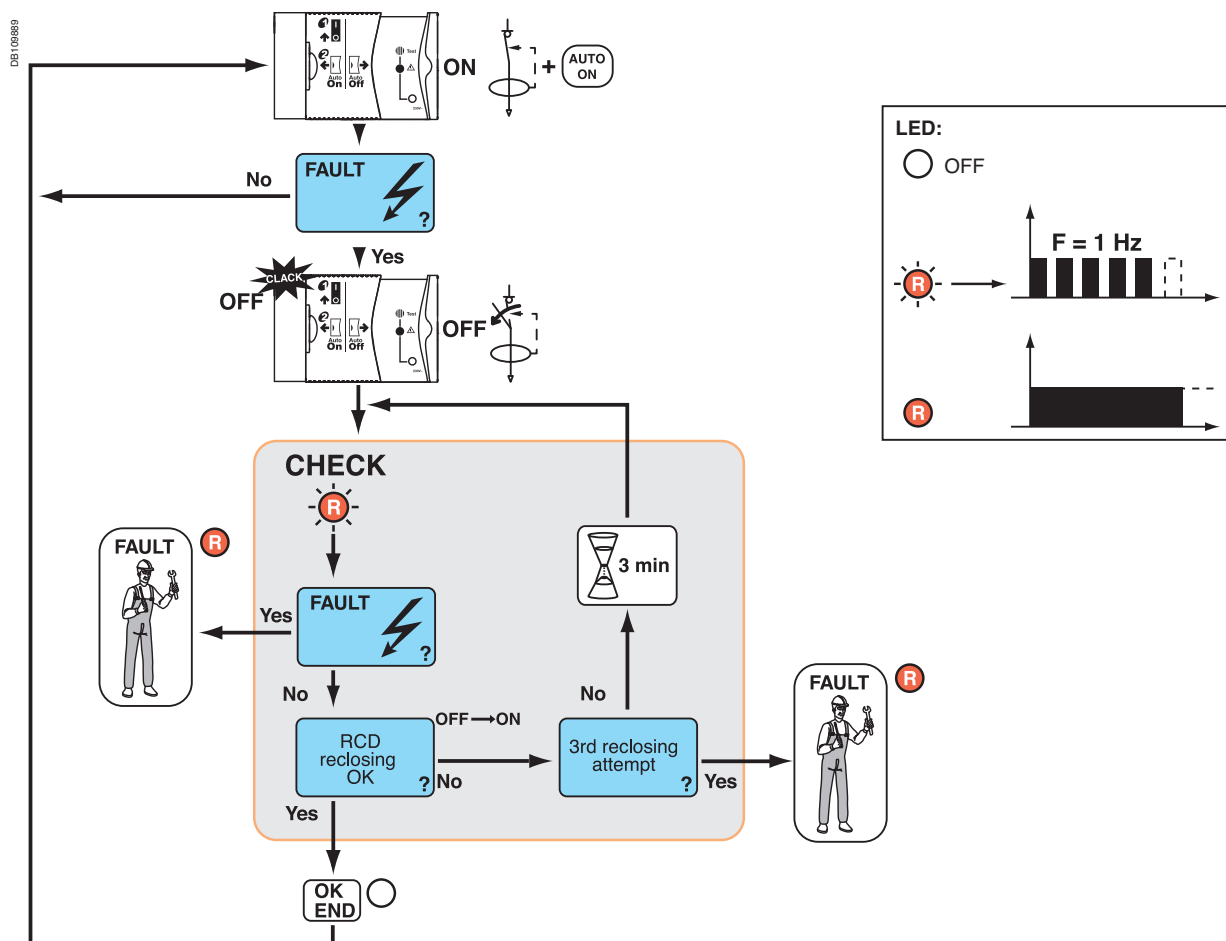
Test

■ this is only possible in manual mode, i.e. sliding cover open in the Auto Off position. You can then manually test the device by pressing the Test key. The downstream installation is then temporarily broken. You must then manually reclose the RED, by activating the O-I lever to power supply the downstream circuit.

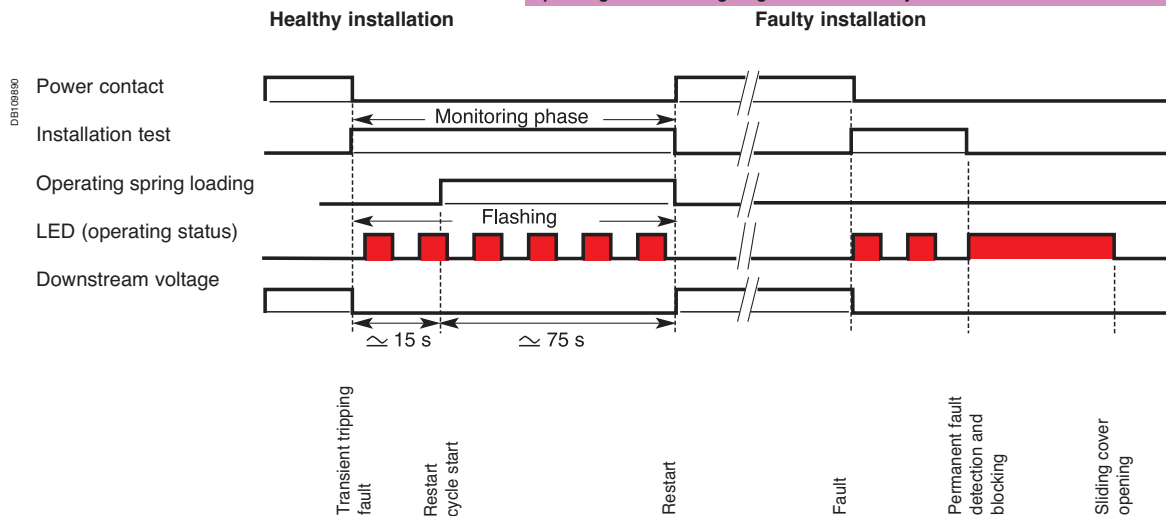
Operation (cont.)

Recloser

Operating diagram of the recloser:



Operating and indicating diagram of a restart cycle:



Multipolar Protection

Residual current circuit breakers

RED 25...63 A

A type - 30 mA

A

II

Protection of people against direct and indirect contacts.

Protection of installations against insulation faults.

Disconnection of on-load electric circuits, already protected against overloads and short-circuits.

Automatic restart after insulation monitoring of the downstream circuit.

PB107780-50



18688

Description

The REDs, **R**esidual current **D**evice recloser, is made up of a residual current device and a recloser.

A type

The REDs **phase-to-neutral** residual current devices provide **A type** earth leakage protection: tripping due to sinusoidal AC residual currents as well as by continuous pulsed residual currents, whether they are applied quickly or increased slowly.

REDs 25...63 A, A type

Common technical data

Power supply	From top and bottom
Voltage rating (Ue)	230 V AC, +10 %, -15 %
Frequency rating	50 Hz
Current rating (In)	25, 40, 63 A
Impulse withstand voltage (Uimp)	4 kV
Insulation voltage (Ui)	500 V
8/20 μ s wave immunity level	250 A
Tropicalisation	Treatment 2 (relative humidity: 95 % at 55°C)
Operating temperature	-5°C to +40°C
Storage temperature	-20°C to +60°C
Weight (g)	360
Protection class	IP20 at terminals
Connection by tunnel terminal with guard	25 mm ² flexible cable or 35 mm ² rigid cable
Mounting	On DIN rail

Residual current device

Compliance with standards	IEC 61008, EN 61008
Making and breaking capacity, rated residual current (I Δ m=I Δ m)	630 A
Breaking capacity in association with protection device	6000 A (gL 63 A)
Tripping time	I Δ n : $\leq$ 300 ms 5I Δ n : $\leq$ 40 ms
Short-circuit current withstand (I Δ c = I Δ nc)	See coordination table of circuit-breaker or fuse with A type REDs (page A63)
Number of cycles (O-C)	Mechanical: 1,000
Fixed sensitivity releases for all ratings	Instantaneous release
Test button min operating voltage	100 V

Recloser technical data

Max duration of a restart cycle	90 s
Number of restart operations	15/hour
Maximum number of consecutive restart attempts (if no earth fault)	3
Min interval between 2 closings	180 s
Insulation fault presence monitoring	Yes
Restart in event of transient insulation fault	Yes
Stopping restart cycle if insulation fault present	Yes, during 15 minutes

Indication

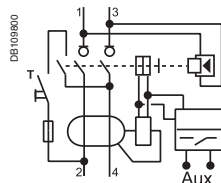
REDs status indication	Mechanical: by O-I (open-closed) 2-position lever Electrical: by 2 indicator lights on the front panel: left: red LED right: green LED Remote: by 1 built-in auxiliary contact
------------------------	---

Auxiliary contact technical data

Voltage rating (Ue)	5...230 V AC/DC
Insulation voltage (Ui)	350 V
Current rating (In)	Min: 0.6 mA Max: 100 mA, power factor = 1
Type	Configurable : NO or NC or intermittent 1 Hz
Connection by tunnel terminal	Flexible or rigid cable: max 2.5 mm ²

REDs 25...100 A

A type - 30 mA and 300 mA



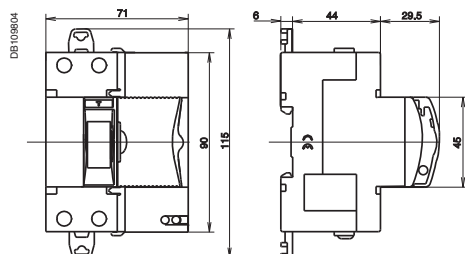
Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Width in mod.of 9 mm	Cat. no.
REDs residual current devices					
2P	230	25	30	8	18687
			300	8	18688
		40	30	8	18689
			300	8	18690
		63	30	8	18691
			300	8	18692
4P	230	25	30	14	18264
			300	14	18265
		40	30	14	18266
			300	14	18267
		63	30	14	18268
			300	14	18269
		100	300	14	18270

Coordination table, max short-circuit current (kA rms) Multi 9 circuit-breaker, fuse / A type REDs coordination

		Multi 9 circuit-breakers					Fuse
		iDPN	iDPNN	C60	C120	NG125	gL 63
REDs A type							
Network	25 A	6	6	6	6	6	6
230 V	40 A	6	6	6	6	6	6
L/N	63 A	-	-	6	6	6	6

Dimensions



Operation

Recloser

The built-in automatic recloser automatically recloses the residual current device after checking insulation of the downstream circuit. If the circuit is faulty, then RCD reclosing is prohibited. After a 15-minute time delay, downstream circuit insulation is checked again.

There are then two possibilities:

- the installation is still faulty: in this case a new check will be carried out in 15 minutes.

The sequence is locally reported by a 5-second intermittent red Led and remotely reported by the auxiliary contact.

- the fault was temporary and has disappeared: the recloser automatically recloses the RCD.

Residual current device

The REDs operates in the residual current device mode without automatic restart when the sliding cover is open, i.e. to the right in the Auto Off position (Fig. 1).

The automatic restart mode is activated when the sliding cover is closed, i.e. to the left in the Auto On position (Fig. 2).

Test

- this is only possible in manual mode, i.e. sliding cover open in the Auto Off position. You can then manually test the device by pressing the Test key. The downstream installation is then temporarily broken. You must then manually reclose the REDs by activating the O-I lever to power supply the downstream circuit.

Remote indication

The auxiliary contact is activated in event of blocking on a residual current fault, during checking and time delay phases.

It can be configured according to 3 possibilities:

- mode 1 : 1 NO contact for an indicator light...
- mode 2 : 1 NC contact for a telephone dialler...
- mode 3 : 1 intermittent contact, F = 1 Hz for a bell...

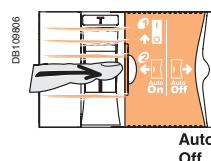


Fig. 1

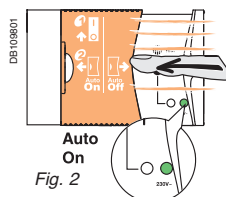
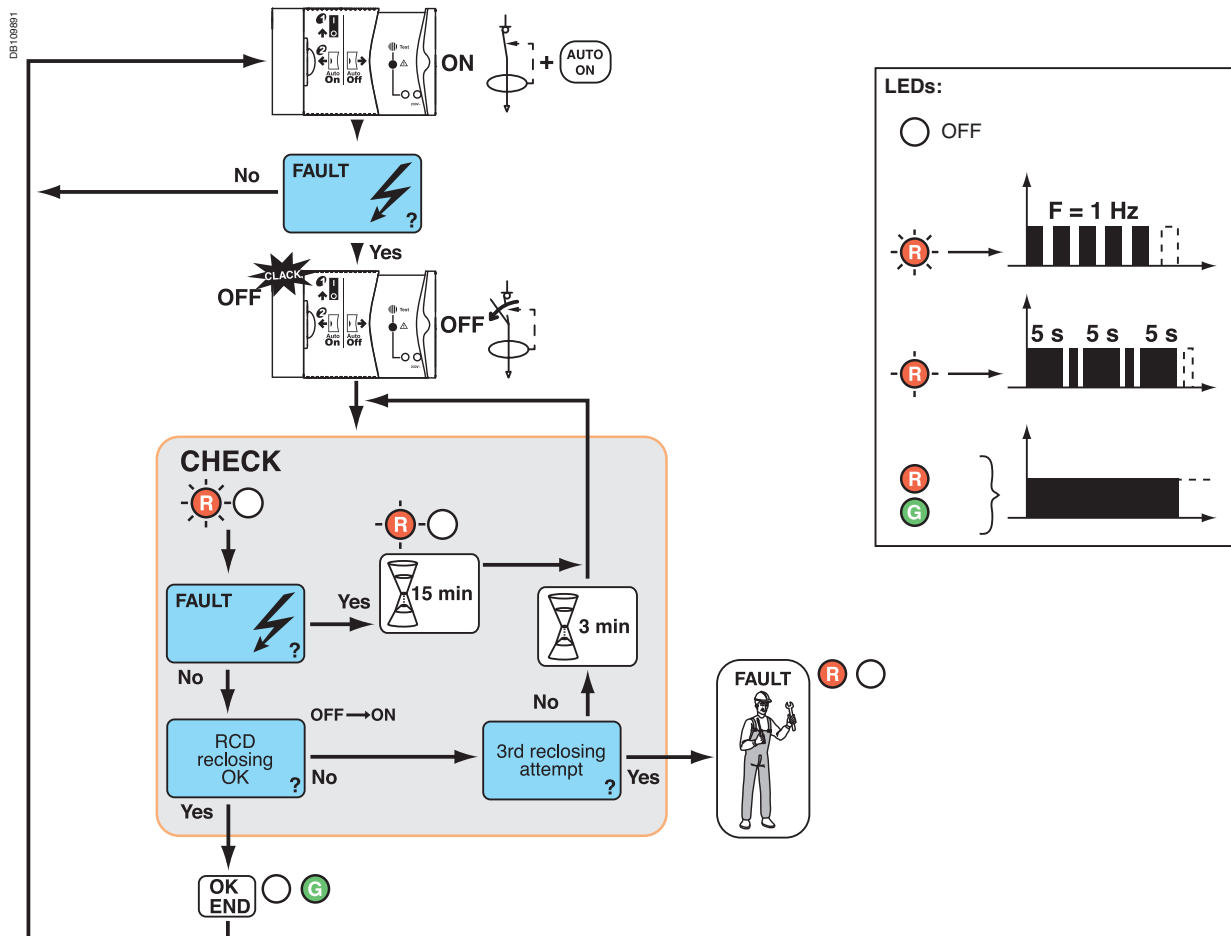


Fig. 2

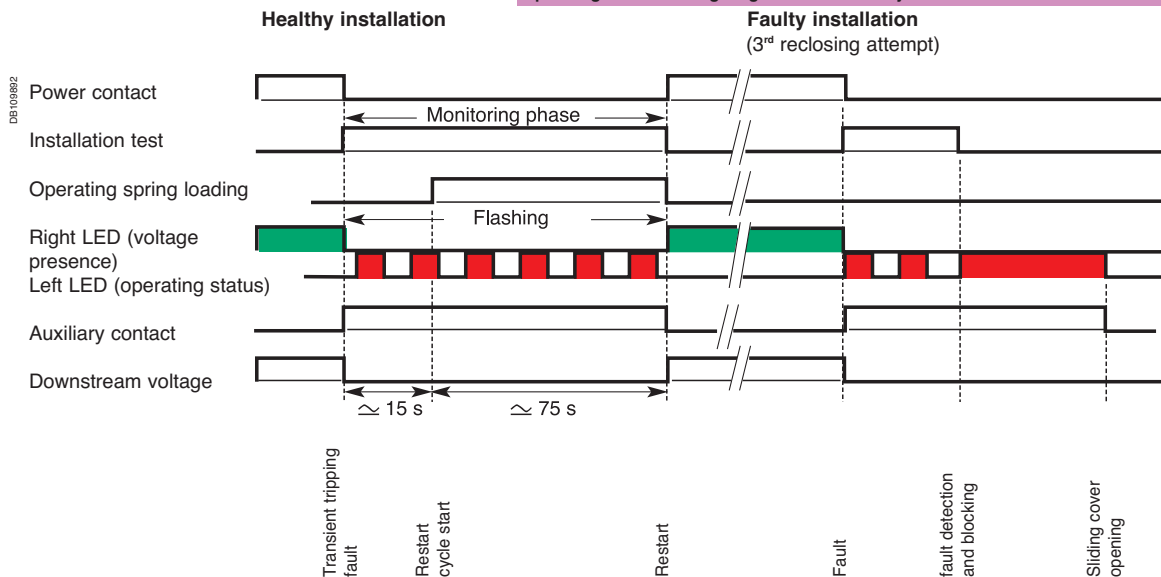
Operation (cont.)

Recloser

Operating diagram of the recloser:



Operating and indicating diagram of a restart cycle:



Multipolar Protection

Residual current circuit breakers

Protection of people against direct and indirect contacts.

Protection of installations against insulation faults.

Disconnection of on-load electric circuits, already protected against overloads and short-circuits.

Automatic restart after insulation monitoring of the downstream circuit.

Periodic automatic testing of the device without downstream circuit power supply breaking.



18280

REDtest 25...63 A

A type - 30 mA and 300mA

Description

The REDtest, **RE**sidual current **D**evice recloser, is made up of a residual current device, a recloser and a product automatic test function (Autotest).

A type

The REDtest **phase-to-neutral** residual current devices provide **A type** earth leakage protection: tripping due to sinusoidal AC residual currents as well as by continuous pulsed residual currents, whether they are applied quickly or increased slowly.

REDtest 25...40 A, A type

Common technical data

Power supply	From top only
Voltage rating (U _e)	230 V AC, +10 %, -15 %
Frequency rating	50 Hz
Current rating (I _n)	25, 40 A
Impulse withstand voltage (U _{imp})	4 kV
Insulation voltage (U _i)	500 V
8/20 μs wave immunity level	250 Å
Tropicalisation	Treatment 2 (relative humidity: 95 % at 55°C)
Operating temperature	-5°C to +40°C
Storage temperature	-20°C to +60°C
Weight (g)	370
Protection class	IP20 at terminals
Connection by tunnel terminal with guard	25 mm ² flexible cable or 35 mm ² rigid cable
Mounting	On DIN rail

Residual current device

Compliance with standards	IEC 61008, EN 61008
Making and breaking capacity, rated residual current (I _{Δm} =I _m)	630 A
Breaking capacity in association with protection device	6000 A (gL 63 A)
Tripping time	I _{Δn} : ≤ 300 ms 5I _{Δn} : ≤ 40 ms
Short-circuit current withstand (I _{Δc} = I _{nc})	See coordination table of circuit-breaker or fuse with A type REDtest (page A66)
Number of cycles (O-C)	Mechanical: 1,000
Fixed sensitivity releases for all ratings	Instantaneous release
Test button min operating voltage	195 V

Autotest and recloser technical data

Autotest

Automatic test	Yes, without power supply breaking
Max duration of Autotest cycle	< 5 minutes

Recloser

Max duration of a restart cycle	90 s
Number of restart operations	15/hour
Maximum number of consecutive restart attempts (if no earth fault)	3
Min interval between 2 closings	180 s
Insulation fault presence monitoring	Yes
Restart in event of transient insulation fault	Yes
Stopping restart cycle if insulation fault present	Yes

Indication

REDtest status indication	Mechanical: by O-I (open-closed) 2-position lever Electrical: by 2 indicator lights on the front panel: left: red/yellow LED right: green LED Remote: by 1 built-in auxiliary contact
---------------------------	--

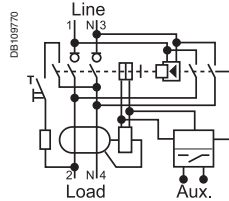
Description (cont.)

Auxiliary contact technical data

Voltage rating (Ue)	12...230 V AC
Insulation voltage (Ui)	600 V
Current rating (In)	Min: 0.6 mA Max: 100 mA, power factor = 1
Type	Configurable : intermittent 1 Hz or NO
Connection by tunnel terminal	Flexible or rigid cable: max 2.5 mm ²

Catalogue numbers

Type	Voltage (V AC)	Rating (A)	Sensitivity (mA)	Width in mod.of 9 mm	Cat. no.
REDtest residual current devices					
2P	230	25	30	10	18280
		40	30	10	18281



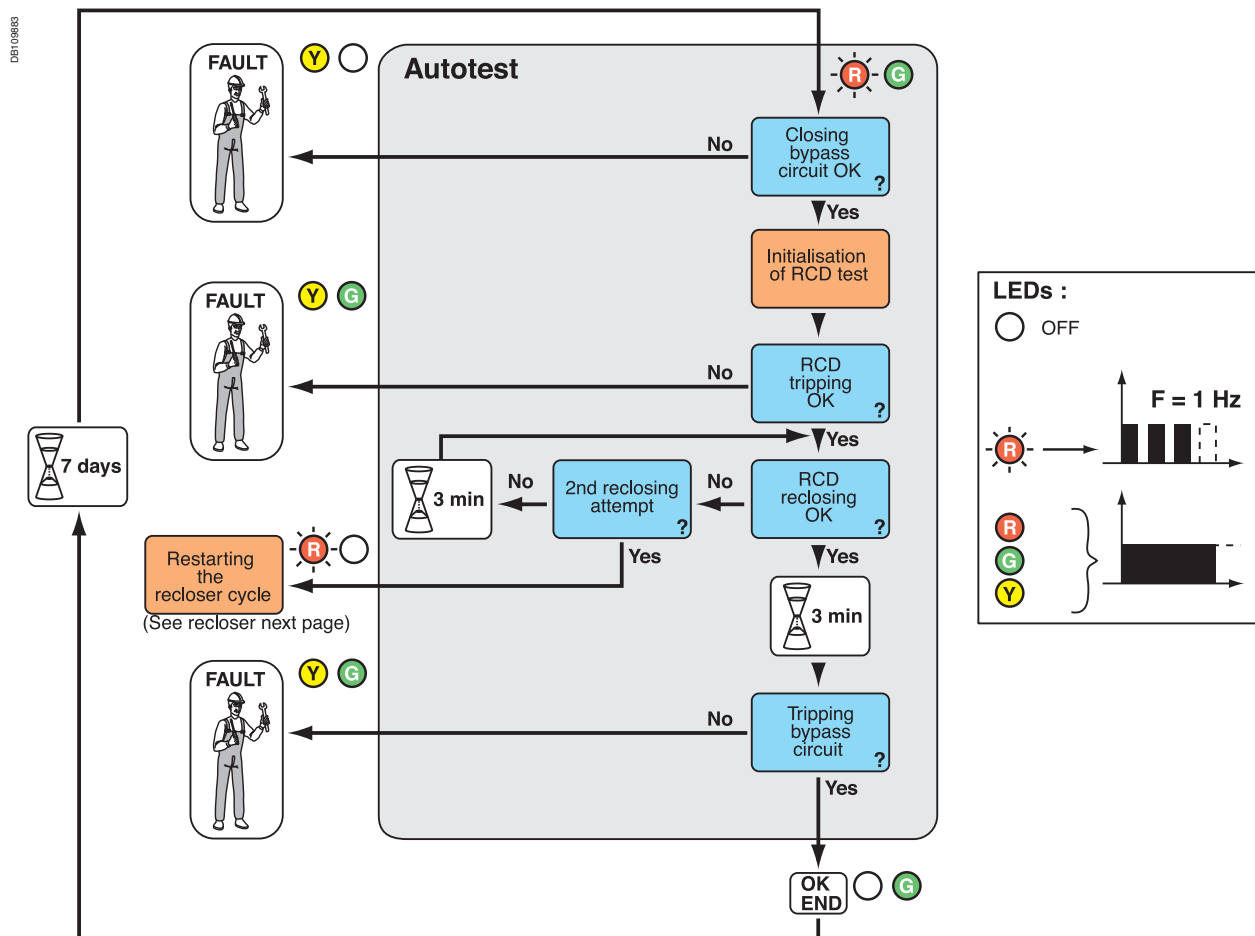
4P	230	40	30	14	18296
			300	14	18297
		63	30	14	18298
			300	14	18299

Coordination table, max short-circuit current (kA rms) Multi 9 circuit-breaker, fuse / A type REDtest coordination

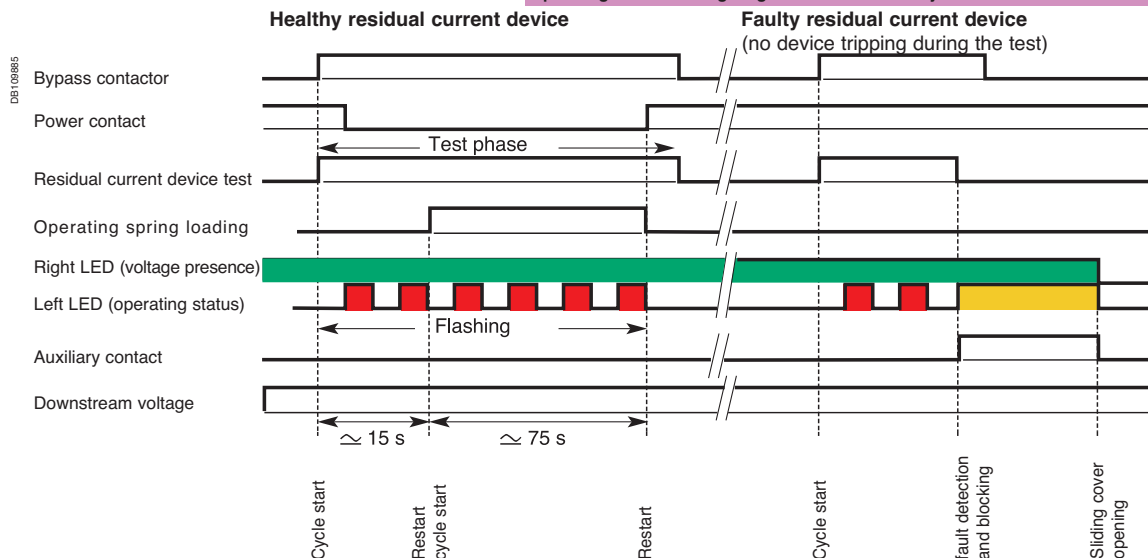
REDtest A type		Multi 9 circuit-breakers					Fuse gL 63
		iDPN	iDPNN	C60	C120	NG125	
Network	25 A	6	6	6	6	6	6
230 V	40 A	6	6	6	6	6	6
L/N							

Autotest

Operating diagram for an Autotest cycle:



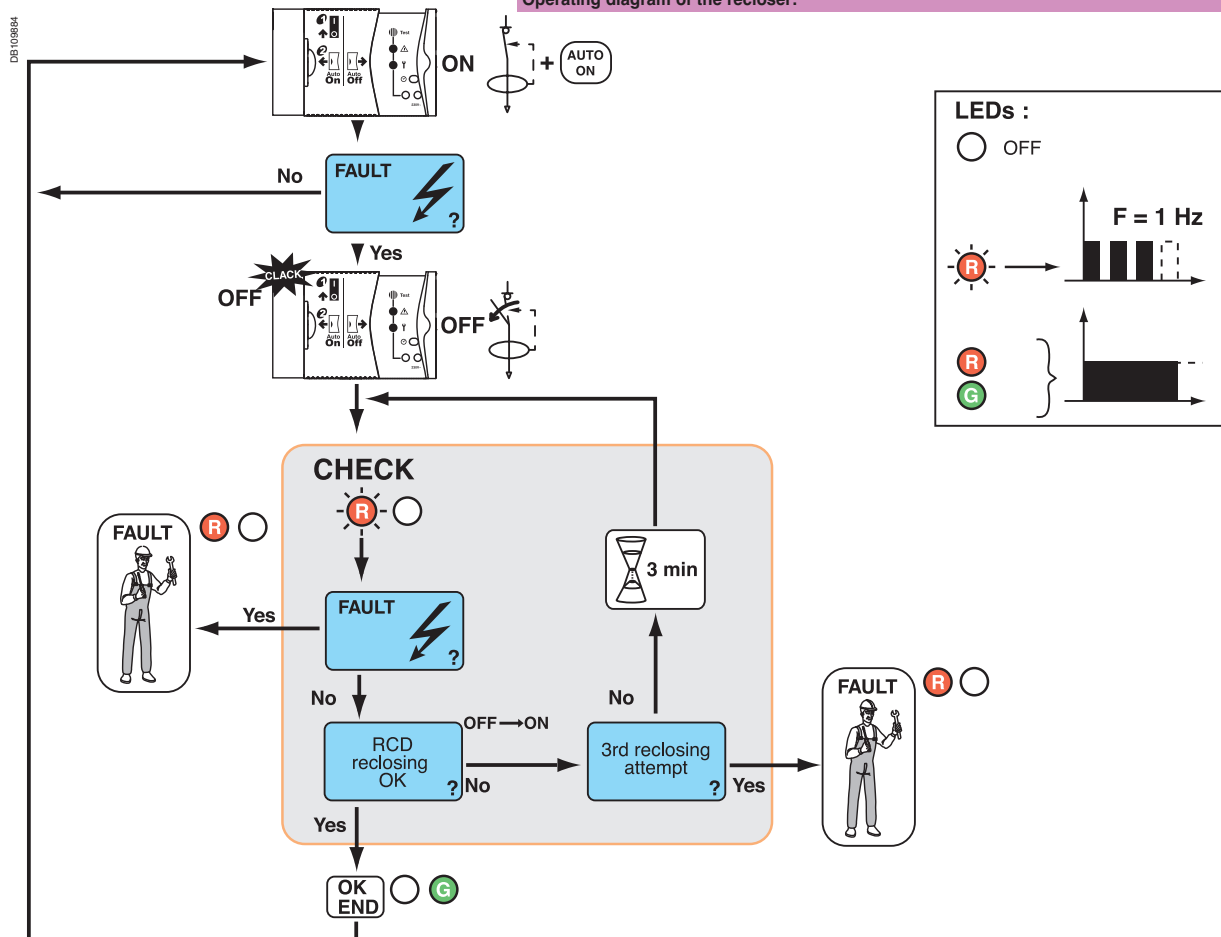
Operating and indicating diagram of an Autotest cycle:



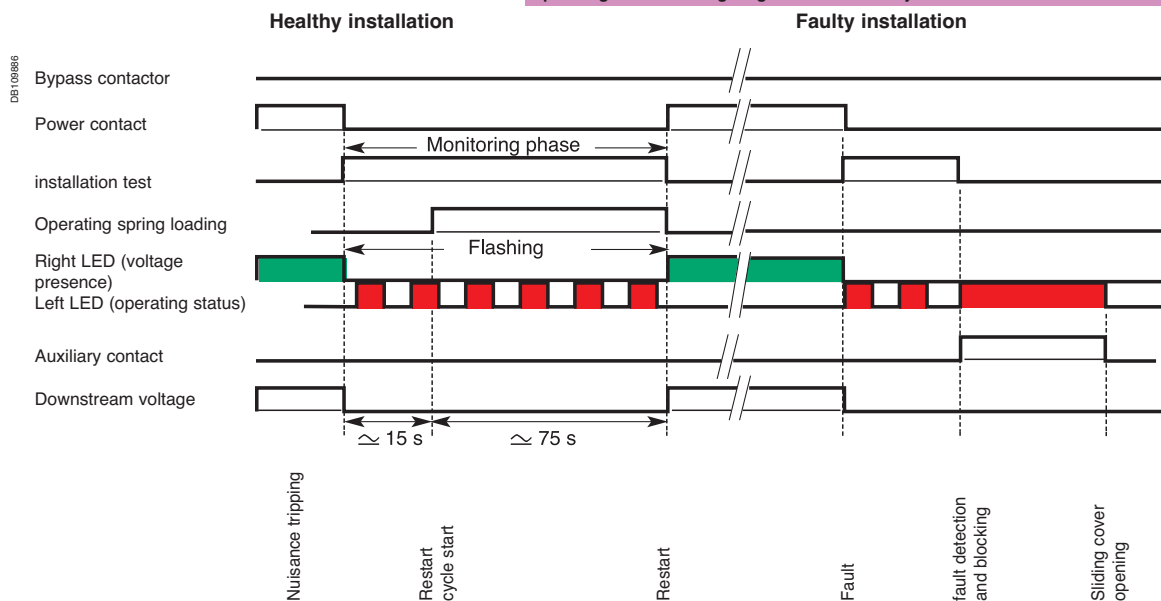
Operation (cont.)

Recloser

Operating diagram of the recloser:



Operating and indicating diagram of a restart cycle:



REDtest 25...63 A

A type - 30 mA and 300 mA

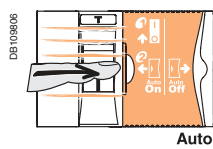


Fig. 1

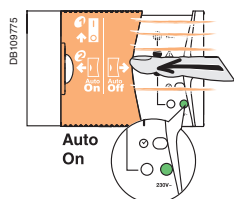


Fig. 2

Operation

The REDtest carries out automatic testing of earth leakage protection every seven days.

The test consists in opening and reclosing the RCD, during which time continuity of supply of the downstream installation is guaranteed.

The built-in automatic recloser, automatically recloses the residual current device, after checking insulation of the downstream circuit. If the circuit is faulty, then RCD reclosing is prohibited.

Residual current device

The REDtest operates in the residual current device mode, without automatic restart, when the sliding cover is open, i.e. to the right in the Auto Off position (Fig. 1).

The automatic restart mode and the Autotest are activated, when the sliding cover is closed, i.e. to the left in the Auto On position (Fig. 2).

Manual test and Autotest

There are two ways of testing earth leakage protection of the REDtest:

- **manual test:** this is only possible in manual mode, i.e. sliding cover open in the Auto Off position. You can then manually test the device by pressing the Test key. The downstream installation is then temporarily broken. You must then manually reclose the REDtest by activating the O-I lever to power supply the downstream circuit.

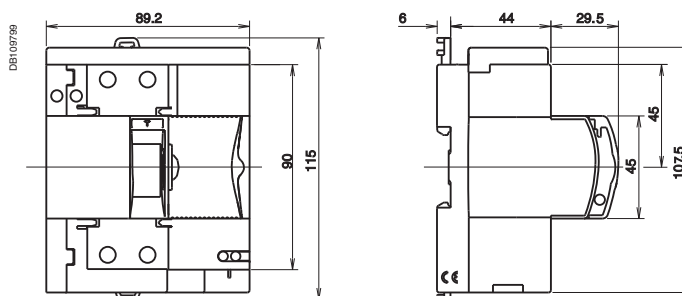
- **Autotest:** after checking installation insulation, the REDtest monitors its residual current device, without breaking the downstream power supply (bypass by bypass contact). If the test is satisfactory, the right LED moves to green, while the left LED remains OFF. If the system is faulty, the left LED moves to yellow and the faulty device must be replaced.

Remote indication

The auxiliary contact is activated in event of blocking on a residual current fault and/or in event of failure of the Autotest function. It can be configured according to 3 possibilities:

- mode 1: 1 intermittent contact, $F = 1 \text{ Hz}$ for a bell...
- mode 2: 1 NO contact for an indicator light...
- mode 3: not used.

Dimensions



For *i* DPN, C60 and C120

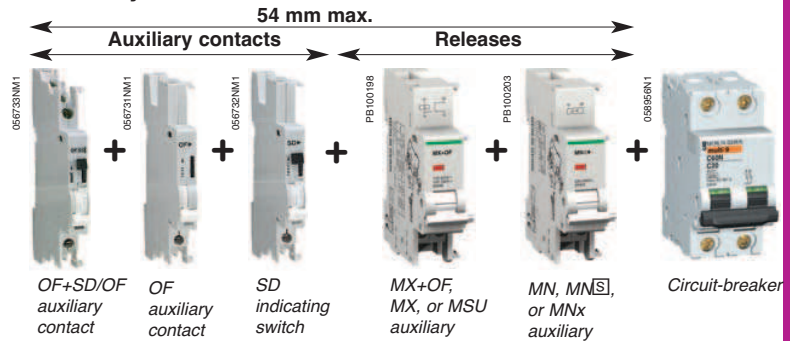
Function

They remotely trip or indicate circuit-breakers, with or without Vigti module.

Description

- They are mounted to the left of the circuit-breaker within a maximum width of 54 mm.
- Fixed using clips (no tools) onto the left side of the circuit-breaker.

Auxiliary combination



- A maximum of 3 indication auxiliaries OF, SD on the same circuit-breaker.
- A maximum of 2 changeover auxiliaries (OF+SD/OF) on the same circuit-breaker.
- A maximum of 1 OF+SD/OF switchover auxiliary and 1 indication auxiliary OF or SD on the same circuit-breaker.
- A maximum of 2 tripping auxiliaries (MX+OF, MX, MN, MN[S], MNx) on the same circuit-breaker.
- A maximum of 3 tripping auxiliaries MSU on the same circuit-breaker without other auxiliary.

For RCCB /ID

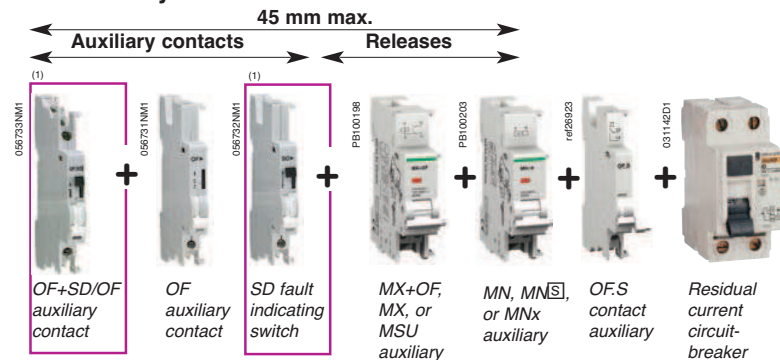
Function

They remotely indicate or trip residual current circuit-breakers.

Description

- They are mounted to the left of the residual current circuit-breaker using the OF.S auxiliary within a max. width of 54 mm.

ID auxiliary combination



- A maximum of 2 indication auxiliaries on the same residual current circuit-breaker.
- A maximum of 1 switchover auxiliary (OF+SD/OF) on the same residual current circuit-breaker without other auxiliary OF, SD.
- A maximum of 2 tripping auxiliaries MX+OF, MX, MN, MN[S], MNx or MSU on the same residual current circuit-breaker.

(1) **Be careful:** SD and OF+SD/OF auxiliary contacts must be only mounted to the left of a tripping auxiliary (MN, MX, MSU,...).



Tripping

Tripping indication on front panel by means of a red indicator.
■ Auxiliaries conform standard IEC 60947-1.

MX + OF shunt trip release

Controls tripping of the device with which it is combined when energised.
It is fitted out with a changeover contact (O + C) to indicate the circuit-breaker's position.
It is fitted with a self-interrupting contact allowing the control circuit to remain on (latching emergency stop).

MX shunt release

Controls tripping of the device with which it is combined at power-up.
It is fitted with a self-interrupting contact allowing the control circuit to remain on (latching emergency stop).

MN release

Controls tripping of the device with which it is combined when its supply voltage drops (threshold between 70 and 35 % of the U_n).
It allows the device to be manually closed if the voltage exceeds 85 % of the nominal voltage.

- Use:
 - emergency stop pushbutton
 - safety on supply circuits of several machines by preventing the "non-controlled" restart of all the motors.

MN selective $\overline{S}$ release

Undervoltage release that controls the opening of the device with which it is combined.
0.3 s time-delay on voltage clip: avoids tripping on brownouts or momentary voltage drops.

MNx release for pushbutton with opening

Completely insensitive to supply circuit interruptions.
It is recommended to connect it upstream of the circuit-breaker it protects in the event of fail-safe emergency stops.
Replaces the "voluntary" MX release fitted out with O/F indicators.

MSU voltage threshold release

Especially designed to monitor the voltage between the neutral and phase(s) conductors.
It cuts off the supply by opening the protected device when a threshold level for overvoltages lasting more than a few tenths of a second is exceeded.

Connection

- Using screw clamp terminals:
 - for 1 or 2 cables of a max. of 2.5 mm²
 - 1.5 mm² with end.
- Visible markers near the terminals.

Remote indication

- All auxiliary contacts conform to standard IEC 60947-5-1.
- The auxiliary contacts OF, SD, OF+SD/OF are also conform with standard EN 62019 for C60, C120 and *i* DPN.

OF open/closed contact

- Changeover contact that indicates the "open" or "closed" position of the device.
- Test button on front panel enables verification of the indication circuit, without having to operate the device.

SD fault indicating switch

- Changeover contact that indicates the "tripped" position of the device.
- Fault indication (SD) on front panel by means of a mechanical indicator.
- Always mount to the left of one or more tripping auxiliaries.

OF+SD/OF changeover contact

- Double changeover contact indicates:
 - the "open" or "closed" position of the circuit-breaker (OF)
 - the "tripped" position of the device (SD)
- 2 circuits:
 - upper: OF
 - lower: SD or OF
- Function choice using the rotary changeover switch on the right side.
- Selected function is indicated on the front panel.
- Fault indication (SD) on front panel by means of a mechanical red indicator.
- Always mount to the left of one or more tripping auxiliaries.

OF.S contact for ID

- Use of the OF.S auxiliary contact is mandatory when adding tripping and indication functions on a residual current circuit-breaker.
- This contact is mounted to the left and indicates the "open" or "closed" position of the residual current circuit-breaker.

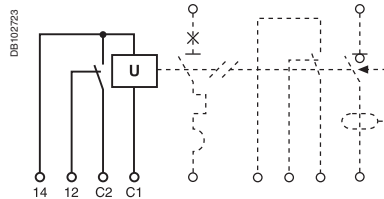
Connection

- Using screw clamp terminals:
 - for 1 or 2 cables of a max. of 2.5 mm²
 - 1.5 mm² with end.
- Visible markers near the terminals.



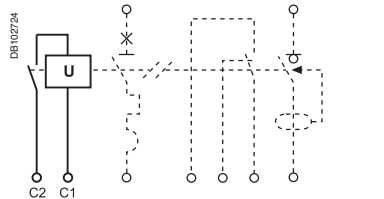
Catalogue numbers

MX + OF shunt trip release



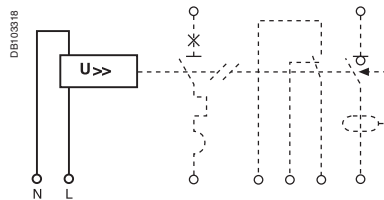
Control voltage (V AC)	(V DC)	Width in mod. of 9 mm	Cat. no.
100...415	100...130	2	26946
48	48	2	26947
12/24	12/24	2	26948

MX shunt release



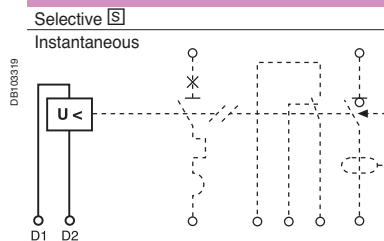
100...415	100...130	2	26476
48	48	2	26477
12/24	12/24	2	26478

MSU voltage threshold release



Tripping voltage (V AC)	Width in mod. of 9 mm	Cat. no.
275	2	26979
255	2	26479

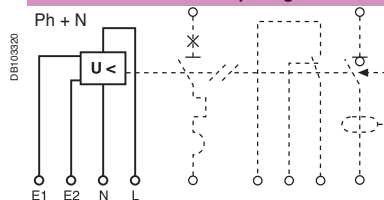
MN undervoltage release



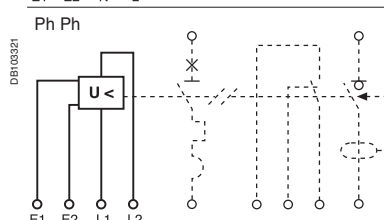
Selective 
Instantaneous

Control voltage (V AC)	(V DC)	Width in mod. of 9 mm	Cat. no.
220...240		2	26963
220...240		2	26960
48	48	2	26961
115 (400 Hz)		2	26959

MNx release for BP with opening



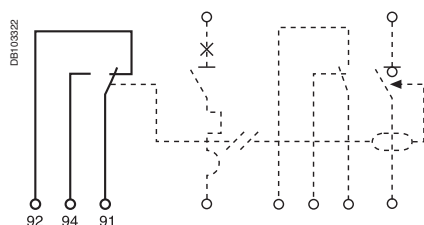
230	2	26969
230 (C60)	2	26977



400	2	26971
400 (C60)	2	26991

Catalogue numbers (cont.)

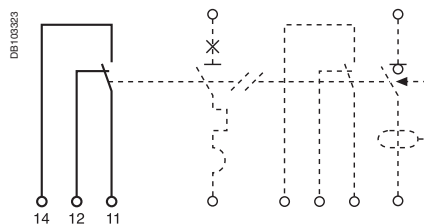
SD fault indicating switch



Width
in mod. of 9 mm
1

Cat. no.
26927

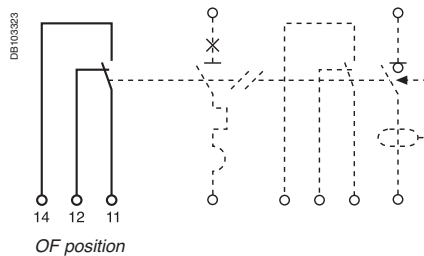
OF contact auxiliary



1

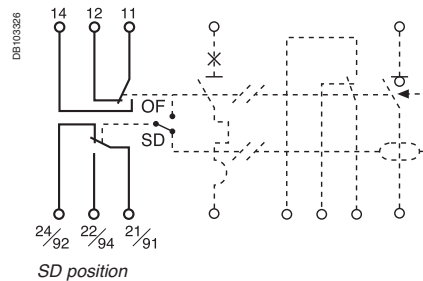
26924

OF+SD/OF changeover contact

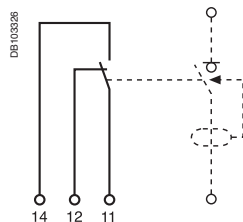


1

26929



OF.S (ID) auxiliary contact



1

26923

function	The accessories simplify integration of the circuit-breakers, residual current circuit-breakers and extend their scope of application.	
description	rotary handle ■ front or lateral control of 2, 3 and 4-pole circuit-breakers ■ degree of protection: IP 40, IK 10 ■ installation: □ circuit-breaker switching sub-assembly cat. no. 27046 is fixed onto the circuit-breaker □ disconnection handle: cat. no. 27047 is mounted on the front face on the mobile panel or the enclosure door □ fixed handle: cat. no. 27048 is fixed onto the enclosure's lateral side ■ a complete rotary handle is made up of a circuit-breaker switching sub-assembly cat. no. 27046, handle cat. no. 27047 or handle cat. no. 27048. dividable mounting plate ≤ 63 A ■ allows isolation with positive break indication ■ can be locked using a padlock with a max. $\varnothing$ of 8 mm, which is not supplied, when the circuit-breaker is removed ■ mounting possibilities: □ in a vertical or horizontal position □ centre distance between two rows: min. of 200 mm □ in Prisma enclosure or cabinet ■ only on single circuit-breaker (without earth leakage module or auxiliary) ■ connection: tunnel terminals for cable of up to 35 mm². padlocking accessory ■ allows the device to be locked in the "open" or "closed" position (using padlock with max. $\varnothing$ of 8 mm, not supplied) Functional opening of the front plate or the door is still possible when the device is locked in the "open" position. screw shield ■ prevents all contact with device terminal screws, degree of protection IP4 ■ optional sealing. terminal shield ■ device terminals can be blocked ■ optional sealing ■ degree of protection IP4 on panel.	insulated distribution terminal ■ 3 holes for aluminium or copper cables: □ rigid cable up to 16 mm² □ flexible cable up to 10 mm² ■ adaptable for C60 > 25 A (35 mm² terminals). terminal 50 mm² Cu / Al ■ for copper or aluminium cables: from 16 to 50 mm² ■ adaptable for C60 > 25 A (35 mm² terminals). Ring tongue terminal connections kit ■ allows connection for ring tongue of up to 63 A, rear or front access (screw $\varnothing$ 5 mm) ■ it includes a «conductive» part and an «insulating» part which guarantees clearance between phases. terminal for rear connection ■ connection using cable up to 50 mm² or lug ■ comes with 1P terminal shield. inter-pole barrier ■ guarantees isolation distances between poles depending on the type of connection used. spacer Can be used for: ■ aligning devices ■ completing rows ■ separating devices in case of excessive overheating. marker strip ■ marking accessory: □ a max. of 6 markers on front face (C60 only) □ 4 markers on terminals. spare label holder ■ allows the identification of 2 P, 3 P, 4 P devices by the handle.

catalogue numbers



type	catalogue number
rotary handle C60/C120	27046
circuit-breaker switching sub-assembly (fixed onto circuit-breaker)	
extended, disconnectable handle (mounted onto mobile panel or door)	27047
front or lateral fixed handle (mounted onto panel)	27048
dividable mounting plate C60/C120	26996
(for 1 pole) centre fixing distance between 2 rows: 200 mm	

catalogue numbers



26970



26981



26976



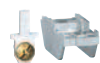
19091 - 19096



27060



17400



18528



27062



marker strip

type			catalogue number
C60/C120/RCCB/ID padlocking accessory	(bag of 2)	C60/ID	26970
	(bag of 4)	C120	27145
C60/RCCB/ID circuit-breaker screw shield	sealable and dividable (bag of 2)		26981
Vigi C60 screw shield	sealable (bag of 10)		26982
C120 circuit-breaker screw shield	sealable and dividable (bag of 2)		18527
C60/RCCB/ID terminal shields	sealable (bag of 2)	1P	26975
		2P	26976
		3P	26975
			+ 26976
		4P	26978
C120 terminal shields	sealable (bag of 2)	1P	18526
		2P	2 x 18526
		3P	3 x 18526
		4P	4 x 18526
C60>25A/C120/RCCB/ID (bag of 4) insulated			19091
distribution terminal	(bag of 3)		19096
C60>25A/C120/RCCB/ID (bag of 1) terminal for aluminium cable			27060
C60/RCCB/ID ring tongue terminal connections kit	(bag of 2) upstream / downstream		17400
terminal for rear connection (with 1P C120 screw shield)	(bag of 2)		18528
inter-pole barrier	(bag of 10)		27001
spacer	width = 9 mm		27062
marker strip			27003...27040
C120 labelholder	(bag of 10 spares)		27150

Tm remote control for circuit-breakers C60, C120 and i DPN

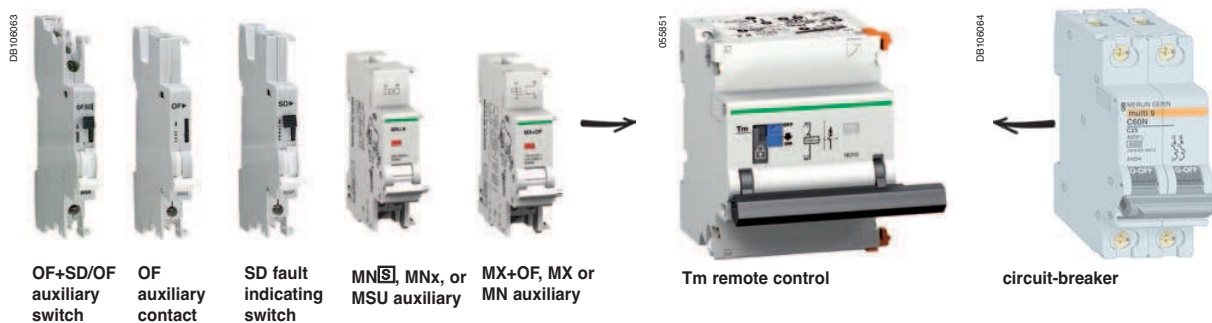
Function

Tm modules allow

- The remote control of circuit-breakers (with or without a Vigti module) via a latched order.
 - Circuit-breaker resetting after tripping, in compliance with the safety rules and regulations in force.
- Local control using the operating handle is still possible, as is adaptation of the other circuit-breaker auxiliaries.

Examples of loads that can be controlled by Tm remote controls: heating, incandescent or LV halogen lighting, motor with a low operating rate.

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
 - padlock the remote controlled circuit-breaker in the “open” position (7 mm diameter padlock not supplied).
- A mechanical indicator shows the “open” or “closed” status of the Tm remote control.
- Reclosing after a fault:
 - must be primarily carried out in manual mode and locally after search and clearance of the fault
 - to impose manual and local resetting, an SD auxiliary switch (cat. no. 26927), cabled in series in the control line of the Tm module, prevents automatic and remote reclosing
 - remote reclosing is possible provided regulations comply with: resetting takes place by opening the control circuit for more than 1.5 s.
- Adaptable auxiliaries to the remote control using mechanical connection clips (without tools) allow:
 - instantaneous or delayed undervoltage tripping: MN and MNx
 - instantaneous shunt tripping: MX+OF, MX
 - fault trip indication: SD
 - indication of the circuit-breaker “open” or “closed” position: OF
- Adaptable auxiliaries to the remote control using electrical and mechanical connection clips:
 - control by an impulse and/or latched order: ACTc
 - time-delayed: ATet.
- Automated device for reclosing: ATm, ATm3 or ATm7.

Tm remote control for circuit-breakers C60, C120 and i DPN

Technical data

- Control voltage (Uc): 230 V AC (-15 % +10 %).
- Frequency: 50/60 Hz.
- Consumption:
 - inrush:
 - Tm: 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 (C-O) under AC1:
 - Tm + circuit-breaker (≤ 25 A): 20 000
 - Tm + circuit-breaker (32...63 A): 10 000
 - Tm + C120 (2P): 10 000
 - opening time by Tm: 1 s
 - closing time by Tm: 2 s.

Connection

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

Weight

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

Tm choice

Circuit-breaker	C60	C120	i DPN
	1-2P	2P	1P+N
	3-4P	3P	3P+N
Tm (1-2P): 18310	■	-	■
Tm (3-4P): 18311	-	■	■
TmC120 (2P): 18312	-	■	-

Catalogue numbers

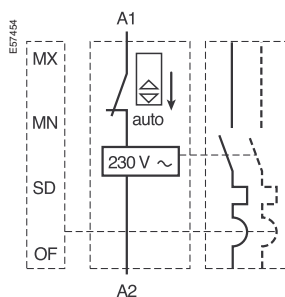
Possible combination	Voltage (V)	Width in mod. of 9 mm	Cat. no.
Tm 1P-1P+N-2P	230	7	18310
TmC120 2P			18312



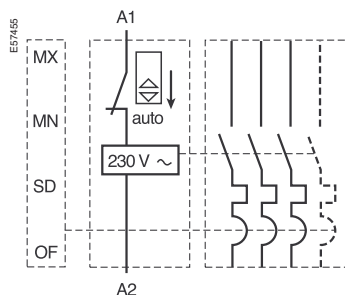
18310



18311



Tm 3P-4P	230	7	18311
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ATm, ATm3 or ATm7 automated devices

for Tm and TmC120 modular remote controls
and for MT Compact NS remote controls

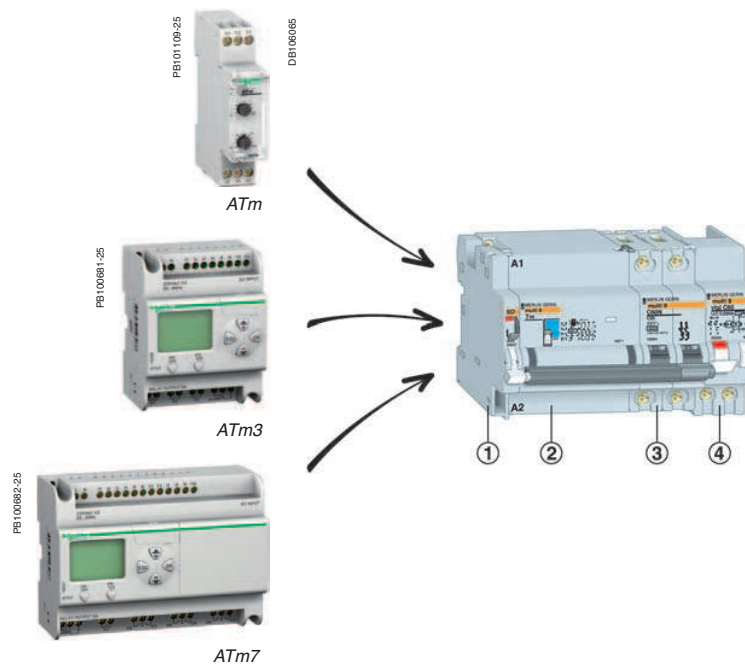
Function

■ The remote control units can be fitted with an ATm, ATm3 or ATm7 automated device that closes them after a transient protection fault, according to the parameters chosen (number of reclosing tests during a given time and reset time delay). It is used to supply isolated unattended facilities that are difficult to access and require very high availability (mobile telephony, motorways, pumping stations, etc.).

Selection

		ATm	ATm3	ATm7
Type of circuit breaker to be remote controllerd	Multi 9	■	■	■
	Compact NS	-	■	■
Number of feeders controlled		1	3	7
Non-differentiated reset on general electrical fault		■	■	■
Differentiated reset according to the source of the fault: thermomagnetic or insulation (RH relay)		-	■	■

Combination



- 1 SD fault indicating switch (mandatory)
- 2 Tm or MT remote control (for Compact NS)
- 3 circuit breaker
- 4 Vigji module

- The automated devices must only be associated with a remote control via an SD auxiliary switch that transmits the “tripped on a fault” protection information to the automated device.
- The automated device locks the remote control if the fault is permanent.
- The manual part of the remote control overrides the automated device.

ATm, ATm3 or ATm7 automated devices for Tm and TmC120 remote controls



ATm

Description

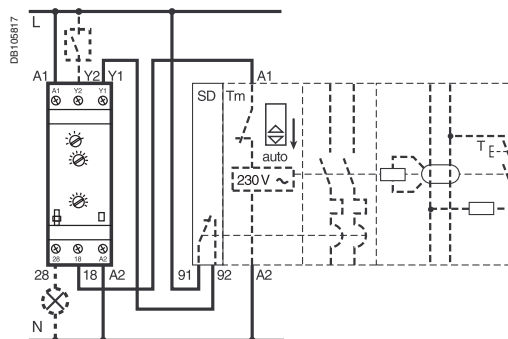
- The single-feeder ATm automated device operates when a general electrical fault (SD) occurs. The following devices are located under the transparent sealable cover on its front panel:
 - a switch that selects the number of permissible reclosures (0 to 10) and stops and resets the ATm (off/reset)
 - a potentiometer T2 that sets the maximum duration (12 to 120 min) allowing the number of reclosures selected on the switch
 - a potentiometer T1 that sets the time delay (30 to 300 s) before an automatic reclosure
 - an indicator light (yellow) that shows the status of the ATm:
 - off: powered off or off/reset position
 - pulsed: normal operation
 - flashing: reclosing cycle in progress
 - steady: Tm locked.
 - It is also fitted with:
 - a circuit-breaker fault indication input (SD)
 - an input for the remote inhibition of the automated device (Y2) by connecting a switch or a door contact to protect the installation
 - an output contact for the remote indication of a locked automated device.

Technical data

- Supply voltage: 230 V AC, 50/60 Hz.
- NO output contacts: 230 V AC, 2 A max. (AC1).
- Power brownout protection: ≤ 10 ms.
- Max power consumption: 14 VA.
- Safety class: 0.
- Connection by tunnel terminal with Posidriv No. 0 captive screw:
 - flexible cable: 2 x 1.5 mm²
 - rigid cable: 2 x 2.5 mm².
- Degree of protection:
 - IP50 for the part outside the enclosure
 - IP20 for the terminals.
- Weight: 66 g.
- Operating temperature: -5°C...+55°C.
- Storage temperature: -40°C...+70°C.
- Tropicalisation: treatment 2 (relative humidity 95 % at 55°C).
- Compliance with: EN 60947-1, EN 60669-2.

Catalogue numbers

Designation	Voltage (V)	Width in mod. of 9 mm	Cat. no.
ATm automated device	230	2	18316





ATm3



ATm7



Memory cartridge

Description

■ The three-feeder ATm3 and seven-feeder ATm7 automated devices operate when a general electrical fault (SD) or a differentiated electrical fault occurs: thermomagnetic (SD) and insulation (RH residual current relay). They also make it possible to delay closing after a return to the mains supply to ensure that the various feeders are reclosed sequentially. They contain:

- an LCD display unit
- circuit-breaker fault indication inputs (SD):
 - ATm3: I1, I3, I5
 - ATm7: I1, I3, I5, I7, I8, I9, I10
- residual current relay fault indication inputs (RH) (optional):
 - ATm3, ATm7: I2, I4, I6
- an input (Y2) to inhibit the automated device remotely by connecting a switch or a door contact to protect the installation
- an output contact for the remote indication of a locked automated device
- a remote control input (Y3) (optional) to force the device back into operation after it has been locked or reset (according to programming)
- remote control output contacts
- navigation keys: +, -, ESC, OK,
- 2 dedicated keys: ON/OFF, , for:
 - operating and inhibiting the ATm
 - diagnosing the state of the feeders: fault count and type
 - access to fault counter and time-delay configuration or initialisation menus
- optional: an EEPROM memory cartridge (cat. no. 18314) to back up the configuration and allow it to be copied to other ATm3 or ATm7 devices.

Technical data

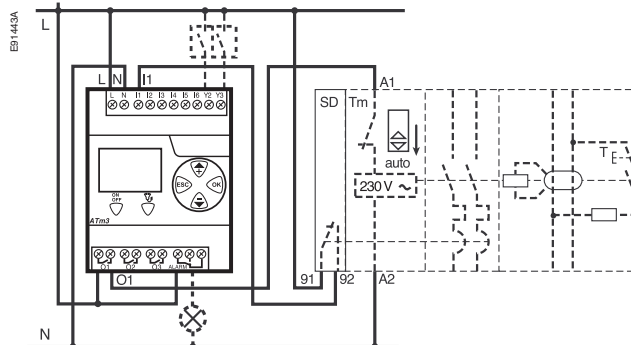
- Supply voltage: 230 V AC, 50/60 Hz.
- output contacts: 250 V AC, 8 A (AC1):
 - ATm3: 3 NO (remote control) + 1 NO/NC (alarm)
 - ATm7: 7 NO (remote control) + 1 NO/NC (alarm).
- Power brownout protection: ≤ 10 ms.
- Max power consumption: 7 VA.
- Safety class:
 - industrial: 0
 - domestic enclosure: 2 (II).
- Connection by tunnel terminal with Posidriv No. 0 captive screw for flexible or rigid cable:
 - 1 x 2.5 mm²
 - 2 x 1.5 mm².
- Degree of protection:
 - IP4/IPxxD for the part outside the enclosure
 - IP2/IPxxD for the terminals.
- Weight:
 - ATm3: 205 g
 - ATm7: 325 g
 - cartridge: 10 g.
- Operating temperature: -5°C...+55°C.
- Storage temperature: -40°C...+70°C.
- Tropicalisation: treatment 2 (relative humidity 95 % at 55°C).
- Compliance with: EN 60947-1, EN 60730-1, EN 60601-1.

ATm3 or ATm7 automated devices for Tm and TmC120 modular remote controls and for MT Compact NS remote controls

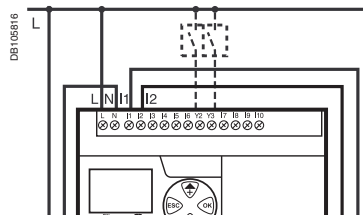
Catalogue numbers

Designation	Voltage (V)	Width in mod. of 9 mm	Cat. no.
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ATm3 automated device	230	8	18306
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ATm7 automated device	230	14	18307
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Memory cartridge (optional)			18314
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function

MX+OF, MXV

Controls the tripping of the circuit-breaker (MX+OF) or Vigî module (MXV) with which it is associated.

MN, MN $\square$, MNx

Controls the tripping of the circuit-breaker with which it is associated.

OF+SD, OF+OF, SDV

Remotely indicates:

- the "open" or "closed" position (OF),
- a fault on the circuit-breaker (SD) or Vigî module (SDV).

early warning

- This function is performed by indicator light and dry contact.
- It indicates the appearance of a leakage current, enabling the user to take action before tripping.
- The early warning threshold can be adjusted on the front panel of the Vigî module.
- It is built into the adjustable Vigî modules, 300 to 3000 mA, of the I/S/R/ type from 230 to 415 V AC.

description

common technical data

- complies with standard
- IEC 60947.5.1 (MX + OF, OF + SD, OF + OF and SDV)
- IEC 60947.2 (MN, MN $\square$, MX and MXV)
- electrical durability: 10 000 cycles (AC 15):
- Ui: class 2 insulation $\square$: 690 V
- Uimp: 8 kV

- degree of pollution: 3
- connection: plate terminal for:
 - 1 or 2 flexible or rigid 2.5 mm² cables
 - 2 x 2.5 mm² uninsulated cable ends
 - 2 x 1.5 mm² insulated cable ends
 - 2 x 1.5 mm² fork lugs



auxiliaries
2 OF+OF
2 OF+SD

MN
MX
MN $\square$
MNx

circuit-breaker
NG125

Vigî

technical data for circuit-breaker auxiliaries

OF+OF

- auxiliary contact

OF+SD

- fault indicating switch

OF+OF or OF+SD

- switchable auxiliary contact

MX+OF

- shunt releases
- tripping: on energisation
- equipped with a contact allowing self-breaking

MN

- undervoltage release
- tripping and opening of the associated circuit-breaker: if supply voltage drops between 70 and 35 %
- reclosing: forbidden if supply voltage is not restored (e.g.: emergency breaking by pushbutton)

MN $\square$

- delayed undervoltage release
- allows a 0,25 second time delay on brownout or voltage drop

MNx

- undervoltage release unaffected by power cuts

technical data for Vigî module auxiliaries

- can be added to:
 - all types of 125 A Vigî module
 - 63 A 300...3 000 I/S/D Vigî module

SDV

- fault indicating switch vigî

MXV

- shunt releases
- tripping: on energisation
- equipped with a contact allowing self-breaking
- impulse withstand: 6 kV
- high impedance input: use an ACTp if leakage current is greater than 1 mA

catalogue numbers



19071

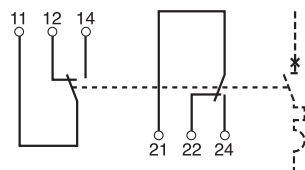
type	voltage	
	(V AC)	(V DC)

catalogue number	width in mod. of 9 mm
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auxiliaries for circuit-breaker

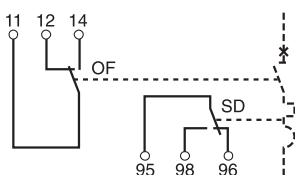
OF + OF 220-240 (6 A)

19071 1



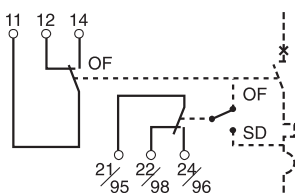
OF + SD 220-240 (6 A)

19072 1

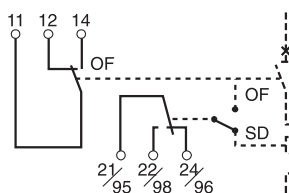


OF+OF or OF+SD 240 (6 A)

19073 1



OF position



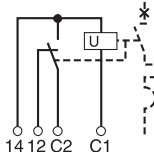
SD position



19064

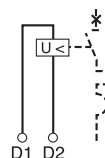
MX + OF	230-415	110-130
	48-130	48
	24	24
	12	12

19064	2
19065	2
19066	2
19063	2



MN	230-240	
	48	
instantaneous		48

19067	2
19069	2
19070	2



19067

Electrical auxiliaries for NG125
and Vigî NG125 module
IEC 60947.5.1



19061



19058

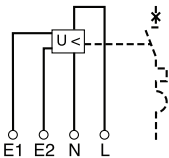


19060

type	voltage (V AC)	(V DC)	catalogue number	width in mod. of 9 mm
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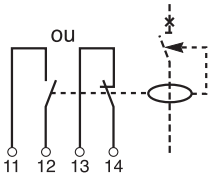
auxiliaries for circuit-breaker (continued)

MNx				
Ph + N	220-240		19061	4
Ph Ph	380-415		19062	4

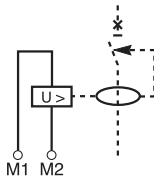


auxiliaries for Vigî module

SDV	NO	250 (0.1 to 2 A)	19058
	NC	250 (0.1 to 2 A)	19059



MXV	110-240	110	19060
-----	---------	-----	-------



NB: High impedance input
(use an ACTp cat. n°15920, if the leakage current of the control device is greater than 1 mA).

functions

The accessories simplify integration of the circuit-breakers and extend their scope of application.

description

screw shield

- prevents contact with device terminal screws
- protection against direct contact
- IP40D: on the front face
- IP20B: at connection level
- class II in metal or plastic enclosures
- optional sealing

terminal shield for circuit-breaker

- installation: mounted upstream and downstream of the circuit-breaker
- phase-to-phase insulation voltage
 $U_i = 1000 \text{ V}$
- protection against direct contact: IP40D
- class II in metal or plastic enclosures (up to 440 V)
- optional sealing

terminal shield for residual current device

- installation: mounted upstream of the circuit-breaker and downstream of the Vigi module
- phase-to-phase insulation voltage
 $U_i = 1000 \text{ V}$
- protection against direct contact: IP40D
- class II in metal or plastic enclosures (up to 440 V)
- optional sealing

rotary handle prolonged

- for circuit breakers and switches NG125, 3P and 4P
- installation: on enclosure door
- utilisation: circuit-breaker control from outside the enclosure
- retains isolation/padlocking in the O position (3 padlocks)
- IP55
- 3 positions:
 - open
 - closed
 - tripped
- door interlocking: opening possible in O position only

direct rotary handle

- for circuit breakers and switches NG125, 3P and 4P
- installation on device front
- retains isolation/padlocking in the O position (3 padlocks)
- 3 positions:
 - open
 - closed
 - tripped

padlocking accessory

- enables padlocking (in I or O position) of 1P or 2P NG125 circuit-breakers:
 - in I position of 3P or 4P NG125 circuit-breakers
- note:** the 3P/4P NG125 circuit-breakers are factory-designed for padlocking in the O position (isolated)
- padlock: $\varnothing 5$ to 8 mm (not supplied)

insulated sub-distribution terminal

- for 3 cables
- cable cross-section for all ratings (circuit-breaker only):
 - flexible cable: 1 to 10 mm²
 - rigid cables: 1.5 to 16 mm²
- phase-to-phase insulation voltage:
 $U_i = 1000 \text{ V}$

matching terminals

for 70 m2 aluminium cables

- cable cross-section for 80, 100 and 125 A ratings: 25...70 mm²

screws and nuts

for lug and bar connection

- installation: upstream or downstream
- connection of 80, 100 and 125 A ratings:
 - copper lug:
 - flexible cable up to 35 mm²
 - rigid cable up to 50 mm²
 - bars: 16x3 mm, 15x4 mm
 - lugs with small eyelet hole
- phase-to-phase insulation voltage:
 $U_i = 1000 \text{ V}$

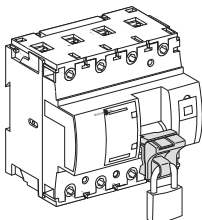
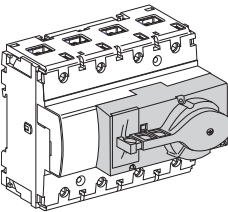
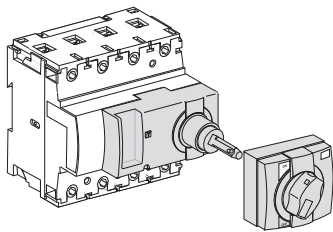
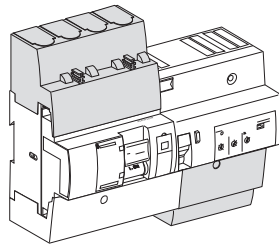
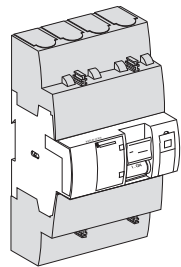
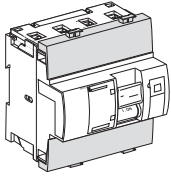
small ring terminal

- connection of 80, 100 and 125 A ratings:
 - flexible copper cable: 50 mm²
 - rigid copper cable: 70 mm²

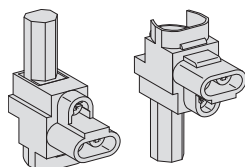
comb busbar

- utilisation: for NG125 circuit-breaker up to 63 A
- direct supply by circuit-breaker terminal (50 mm² max. rigid cable)
- tooth shield available for unused teeth
- length (dividable): 16 modules of 27 mm, i.e. 48 modules of 9 mm
- 125 A max. upstream
- insulation voltage: 690 V
- Uimp: 8 kV
- degree of protection when used with tooth-shield: IPxxB

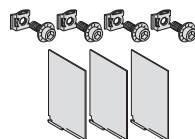
références



type		catalogue number
<u>screw shield for circuit-breaker (set of 10 parts)</u>		
	1P	19084
	2P	19085
	3P	19086
	4P	19087
<u>terminal shield for circuit-breaker (the set)</u>		
	1P	19080
	2P	19081
	3P	19082
	4P	19083
<u>terminal shield for residual current device (the set)</u>		
63 A	2P	19074
	3P	19075
	3P adjustable	19077
	4P	19076
	4P adjustable	19078
125 A	3P	19077
	4P	19078
<u>rotary handle</u>		
extended standard	black	19088
extended safety	red handle	19089
	yellow background	
direct standard	black	19092
direct safety	red handle	19097
	yellow background	
<u>padlocking accessory</u>		
	set of 4 parts	19090



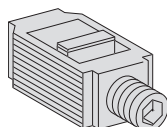
type	catalogue number
insulated sub-distribution terminal	
(set of 4 parts)	19091
(set of 3 parts)	19096



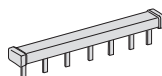
screws and nuts for lug or bar connection	
(set of 4 parts)	19093



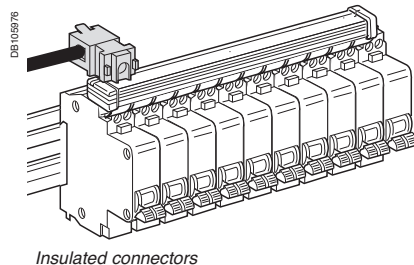
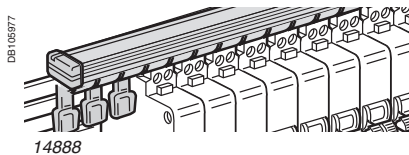
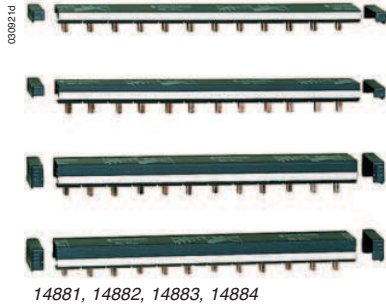
small ring terminals	
(set of 4 parts)	19094



matching terminal for aluminium cable	
(set of 4 parts)	19095



connection comb busbar	
1P	14811
2P	14812
3P	14813
4P	14814
tooth-shield end (set of 20 parts)	14818



Function

Accessories simplify the implementation of multi 9 system products.

- Delivered with 2 side plates IP 2.
- Outgoers can be marked.
- Cutting marks on busbars and insulating material.
- Self-extinguishing insulating material colour RAL 7016.
- Unused teeth can be isolated using tooth cover ends.

Technical data

1P, 2P, 3P and 4P comb busbars for C60a/N/H, STI and ID

- Supply by using semi-rigid cable directly in the device's tunnel:
 - cross-section of 25 mm² for C60 and ID all ratings
 - cross-section of 10 mm² for STI.
- Using 25 mm² semi-rigid cable when using the connector cat. no. **14885**.
- Permissible current at 40°C:
 - 80 A with 1 central feed point
 - 100 A with 2 feed points.
- Rated insulation voltage: 500 V (as in IEC 60664).
- Short-circuit current withstand: compatible with the breaking capacity of modular Merlin Gerin circuit-breakers.

1P, 2P, 3P and 4P comb busbars for C120 and NG125

- Supply directly on the circuit-breaker terminal: max. 50 mm² rigid.
- Permissible current at 40°C: 125 A.
- Max. current per outgoer: 63 A.

Insulated connectors

- Compatible with all Merlin Gerin comb busbars.
- Clip-on to the busbars insulating material, which makes them very stable.
- Can be made with clip-on markers allowing for circuits to be identified.

Catalogue numbers

type	number of busbars	number of mod.	Cat. no.
Comb busbars for C60 a/N/H, STI and ID			
1P	1	24	14881
	2	48	14891
2P	1	24	14882
	2	48	14892
3P	1	24	14883
	2	48	14893
4P	1	24	14884
	2	48	14894

Comb busbars for C120, NG125 ≤ 63 A

1P	(L=430 mm, 16 poles)	14811
2P	(L=430 mm, 16 poles)	14812
3P	(L=405 mm, 15 poles)	14813
4P	(L=430 mm, 16 poles)	14814

Type	Cat. no.
Comb busbar accessories for STI, C60 and ID	
Set of 40 side plates	for 1P, 2P comb busbars 14886
	for 3P, 4P comb busbars 14887
Set of 40 tooth cover ends	for 1P, 2P, 3P, 4P comb busbars 14888
Set of 4 insulated connectors	for 25 mm ² cable 14885
Connector for C60 and ID supply	for 35 mm ² cable 26998
Comb busbar accessories for C120 and NG125	
Set of 20 tooth cover ends	for 1P, 2P, 3P, 4P comb busbars 14818

function Distribloc is a fully insulated four-pole modular splitters. It is connected in a screw terminal or a spring terminal without screw.

description

technical data

- rated insulation voltage: 690 V
- permissible peak current: $I_{pk} = 20 \text{ kA}$
- complies with the low voltage switchgear standard: IEC 947.7.1.
- rated current at 40 °C: 125 A
- installation:
 - clipped onto a symmetrical rail
 - fits perfectly onto a row next to another modular device:
 - 45 mm nose
 - 12 mod. of 9 mm
 - can be screwed onto a plain or mounting grid
 - cannot be installed in flush-mounting Pragma enclosures

connection

- incomer:
 - in a tunnel terminal for 35 mm² flexible or rigid cables
 - optional factory-built link for NG125 (catalogue number: 07054)
- outgoer in spring terminals:
 - minimum cross-section: 1 mm²
 - simplifies rebalancing of phases and extensions
 - unaffected by temperature variations
 - spring contact pressure automatically adapted to conductor cross-section
 - a single cable without metal end per spring:
 - by flexible cables:
2 x 10 mm² + 3 x 6 mm² + 7 x 4 mm²
 - by rigid cables:
2 x 16 mm² + 3 x 6 mm² + 7 x 4 mm²
- outgoer in screw terminals:
 - 1 x 16 mm² or 25 mm² flexible or rigid cables

catalogue numbers			
type		catalogue number	width in mod of 9 mm
Distribloc			
Distribloc 125 A		07105	12
accessory			
set of 4 125 A flexible links		07054	

catalogue numbers



markers		box cat. no.
figures	0	27017
	1	27029
	2	27030
	3	27031
	4	27032
	5	27033
	6	27034
	7	27035
	8	27036
	9	27037
letters	A	27003
	B	27004
	C	27005
	D	27006
	E	27007
	F	27008
	G	27009
	H	27010
	I	27011
	J	27012
	K	27013
	L	27014
	M	27015
	N	27016
	O	27017
	P	27018
	Q	27019
	R	27020
	S	27021
	T	27022
	U	27023
	V	27024
	W	27025
	X	27026
	Y	27027
	Z	27028
miscellaneous	+	27038
	-	27039
	blank	27040

functions

These ensure the protection of single-phase or three-phase motors with local manual control.
This protection includes:

- isolation
- manual control or remote control

- protection against short circuits (magnetic)
- protection against overloads (thermal)

description

P25M circuit-breakers

technical data

- compliance with IEC 947-2 and IEC 947-4-1 standards (association with contactors)
- approvals: CEBEC, DEMKO, NEMKO, SEMKO, FI.
- voltages
 - voltage rating (Ue): 690 V AC
 - insulation voltage (Ui): 690 V
 - impulse voltage (Uimp): 6 kV
- ratings (In): adjustable from 0.16 to 25 A
- tripping
 - thermal tripping:
 - sensitive to phase failure
 - ratings (In): adjustable from 0.16 to 25 A
 - temperature compensation: - 20 °C to + 40 °C in an enclosure
 - magnetic trip unit:
 - 12 times the In rating (± 20 %)
- breaking capacity as per IEC 947-2 (kA)
 - P25M circuit-breakers:

rating (A)	Voltage (V)											
	230...240		400...415		440		500		690			
	Icu kA	Ics %	Icu kA	Ics %	Icu kA	Ics %	Icu kA	Ics %	Icu kA	Ics %	Icu kA	Ics %
0.16 to 1.6					unlimited							
2.5									3	75		
4									3	75		
6.3					50	100	50	100	3	75		
10					15	100	10	100	3	75		
14			15	50	8	50	6	75	3	75		
18			15	50	8	50	6	75	3	75		
23	50	100	15	40	6	50	4	75	3	75		
25	50	100	15	40	6	50	4	75	3	75		

- AC3 electrical durability: 100 000 O-C cycles
- padlocking device on front face

- tropicalisation: treatment 2 (relative humidity: 95 % at 55 °C)
- environment:
 - utilisation temperature: -20...+60 °C
 - storage: -40...+80 °C
 - weight (g)

type

P25M	260
limiter block	130

- connection: using terminal clamps:
 - 2 x 1 mm² min. rigid copper cables
 - 2 x 6 mm² max. flexible copper cables

limiter block

Allows the breaking capacity to be increased up to 100 kA at 415 V.

- individual mounting (upstream/ downstream) or on a terminal block, catalogue number **21144**
- connection: tunnel terminals for 25 mm² flexible cables.

catalogue numbers

21115



21113

type	rating In (A)	setting
------	---------------------	---------

P25M circuit-breaker

3P	0.16	0.1-0.16
	0.25	0.16-0.25
	0.40	0.25-0.40
	0.63	0.40-0.63
	1.0	0.63-1
	1.6	1-1.6
	2.5	1.6-2.5
	4.0	2.5-4
	6.3	4-6.3
	10	6-10
	14	9-14
	18	13-18
	23	17-23
	25	20-25

type	rating In (A)
------	---------------------

limiter block	63
---------------	----

catalogue number	width in mod. of 9 mm
---------------------	-----------------------------

21100	5
21101	5
21102	5
21103	5
21104	5
21105	5
21106	5
21107	5
21108	5
21109	5
21110	5
21111	5
21112	5
21113	5

catalogue number	width in mod. of 9 mm
---------------------	-----------------------------

21115	5
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additional information

electrical auxiliaries: page A103-A104
accessories: page A105
dimensions: page A114

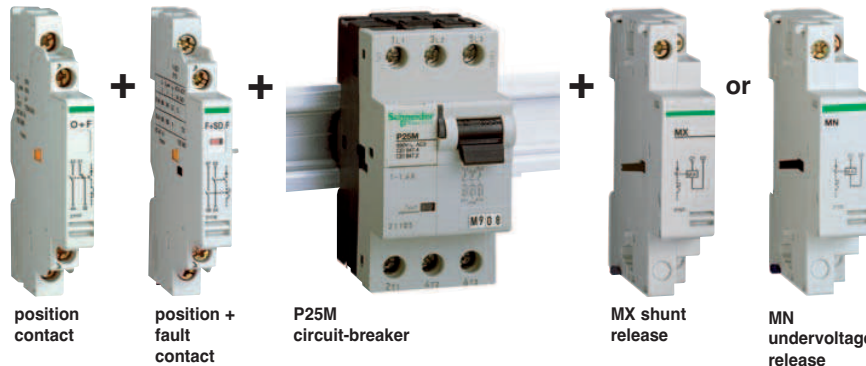
functions Electrical auxiliaries allow remote tripping or fault or position indication of P25M circuit-breakers

description

combination of auxiliaries

They are mounted:

- on the lefthand side of the circuit-breaker (position and position + fault contacts)
- on the righthand side of the circuit-breaker (MX + OF and MN trip units).



remote tripping

This can be achieved using an MX or an MN release fixed to the right of the circuit-breaker.

MX shunt release

When energised, trips device controls tripping and opening of the circuit-breaker with which it is associated.

MN undervoltage release

When its supply voltage decreases, this device controls tripping and opening of the circuit-breaker with which it is associated.

These contacts are fixed to the left of the P25M, one "position-fault indication contact" block and one "position contact" block maximum.

technical data

■ rated current (Ie) of auxiliary contacts under the rated voltage (Ue)

voltage rating Ue	current rating Ie			
	position contact		fault contact	
	AC 15	DC 13	AC 14	DC 13
(V AC) (V DC)	(A AC)	(A DC)	(A AC)	(A DC)
415	220	2.2	0.5	-
240	110	3.3	1.3	-
130	60	4.5	3	0.5
48	48	6	5	1
24	24	-	6	1.5

remote indication of the P25M circuit-breaker position

This is achieved with the help of position or fault tripping contacts, mounted to the left of the device:

P25M circuit-breaker "open" or "closed" position contact

It can be obtained using "position contact" blocks:

- O to indicate the "contact open" position during rest cycles
- F to indicate the "contact closed" position during rest cycles

Two versions are available:

- O + F
- F + F

These contacts are fixed to the right of the P25M (two blocks maximum).

position and fault tripping contact

It can be achieved using "position contact + fault indication contact" blocks:

- SD.O to indicate a contact open fault
- SD.F to indicate a contact closed fault.

Four versions are available:

- F + SD.F
- O + SD.O
- F + SD.O
- O + SD.F

Technical data common to auxiliaries

■ connection: terminal clamps for:

- 2 x 1 mm² min. rigid cables
- 2 x 2.5 mm² max. flexible cables
- 2 x 1.5 mm² flexible cable with end.

catalogue numbers



21128



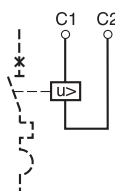
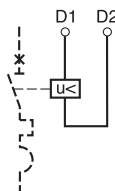
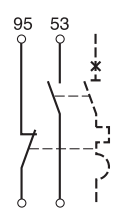
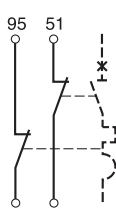
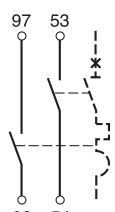
21130



21117



21118

type	control voltage (V AC)	frequency (Hz)	catalogue number	width in mod. of 9 mm
MX shunt release				
	220...240	50	21127	2
	380...415	50	21128	2
MN undervoltage release				
	220...240	50	21129	2
	380...415	50	21130	2
position contact				
	O + C		21117	1
	C + C		21116	1
				
position and fault signal contact				
	C + SD.C		21118	1
	O + SD.C		21119	1
	C + SD.O		21120	1
	O + SD.O		21121	1
				
				
				

additional
information

dimensions: page A114

Multipolar Protection

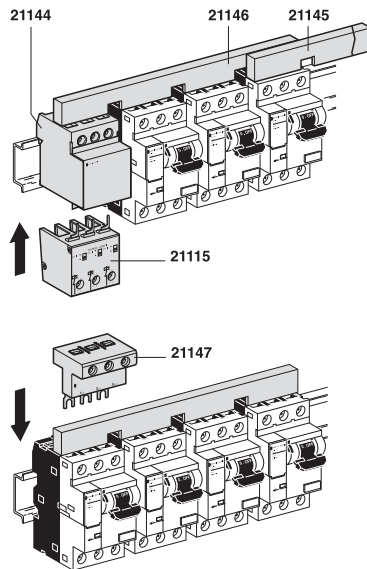
Motor protection breakers

Accessories for P25M

functions

The accessories simplify circuit-breaker integration and extend their use.

description



comb busbars

- 63 A three-phase
- for fast supply of several P25M
- 54 mm module comb busbars for 2 or 4 P25M feeders
- for more feeders, comb busbars may be combined within the limit of the 63 A maximum current
- possible mounting of an auxiliary contact between each P25M.

insulation enclosure

- for individual installation of a P25M with a block («position contact», «position contact + fault tripping contact») and a release (MX or MN) in an IP 55 sealed double insulation enclosure (sealable cover).
- this enclosure is equipped with neutral and earth strips. Its front face can be fitted with an ON/OFF indicator light (punch-out)
- punch-outs for 4 x 16 mm diameter cable glands

protective cable end

- recommended to insulate comb busbar outlets on standby.

terminal block

- downstream powering of comb busbars with 25 mm² diameter cables, and housing of the limiter block.

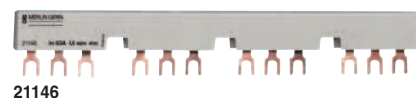
insulated connector

- upstream powering of comb busbars or powering of P25M with 25 mm² diameter cables.

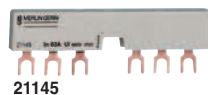
clip-on terminal markers

- for identification on the front face:
 - of the circuit-breaker (4 markers max.)
 - of the auxiliaries (3 markers max.).
- (See page A101)

catalogue numbers



21146



21145



21133



21143

type		catalogue number
comb busbar	2 P25M feeders	21145
	4 P25M feeders	21146
protective cable end		21148
downstream terminal block		21144
insulated connector		21147
enclosure	W = 93, H = 147, D = 100 (mm)	21133

type	voltage (V)	colour	catalogue number
neon indicator lamp	230...240	green	21140
		red	21142
	400...415	green	21141
		red	21143

additional information

dimensions: page A114

C60LMA circuit-breakers

IEC 60947-2: 25 kA (i 25 A)
and 20 kA (40 A)

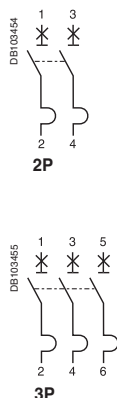


26353



26369

- Connection: tunnel terminals for:
 - 16 mm² flexible or 25 mm² rigid cables up to a rating of 10 A
 - 25 mm² flexible or 35 mm² rigid cables for ≥ 12.5 A ratings.



Function

The C60LMA circuit-breakers are designed to protect motor supply circuits (cables and starters) against short-circuit currents.

As they are equipped only with magnetic trip units, they must be combined with suitable thermal protection.

Tripping curves

MA curve

Cables feeding motor starters

- Power circuit:
 - rating: 1.6 to 40 A set at 40°C
 - tripping curve: the magnetic trip units operate at $12 I_n \pm 20\%$.

Technical data according to IEC 60947-2

- Power circuit:
 - voltage rating (U_e): 440 V AC
 - impulse voltage (U_{imp}): 6 kV
 - insulation voltage (U_i): 500 V AC
 - breaking capacity:

- according to IEC 60947-2, I_{cu} ultimate breaking capacity (O-CO cycle):

Rating (A)	Type	Voltage (V)	Breaking capacity I_{cu} (A)
1.6...25	2P, 3P	230...240	50
		400...415	25
		415	6 (1)
		440	20
40	2P, 3P	230...240	40
		400...415	20
		415	5 (1)
		440	15

(1) breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

General technical data

- Fast closing: allows the high inrush currents of some loads to be better held.
- Isolation with positive break indication: opening is indicated by a green strip on the device operating handle. This indicator shows opening contacts of all the poles.
- Number of cycles (O-C): 20 000.
- Earth leakage protection provided by the C60LMA + Vigi module combination:

MA release rating (A)	Vigi module rating (A)
1.6...10	≤ 25
12.5 and 16	≤ 40
25 and 40	≤ 63

- Environment:
 - tropicalisation: treatment 2 (relative humidity: 95 % at 55°C) according to IEC 60068-1
 - weight (g):

Type	2P	3P
C60LMA	240	360

Type	Max. motor rating (A)	Width in mod. of 9 mm	Release	I (A) magn.	catalogue number
2P	1.6	4	MA 1.6	20	26345
	2.5	4	MA 2.5	30	26346
	4	4	MA 4	50	26347
	6.3	4	MA 6.3	75	26348
	10	4	MA 10	120	26349
	12.5	4	MA 12.5	150	26350
	16	4	MA 16	190	26352
	25	4	MA 25	300	26353
	40	4	MA 40	480	26355
3P	1.6	6	MA 1.6	20	26357
	2.5	6	MA 2.5	30	26358
	4	6	MA 4	50	26359
	6.3	6	MA 6.3	75	26360
	10	6	MA 10	120	26361
	12.5	6	MA 12.5	150	26362
	16	6	MA 16	190	26368
	25	6	MA 25	300	26369
	40	6	MA 40	480	26370

function

The NG125LMA circuit-breakers are designed to protect motor supply circuits (cables and starters) against short-circuit currents.

As a rule they must be completed by overload protection by means of a Telemecanique thermal relay (see coordination table).

description

common technical data

- trip units: 4...80 A
- reference temperature: 40 °C
- Uimp: 8 kV
- Ui: 690 V
- maximum voltage rating: 500 V AC
- breaking capacity: as in IEC 947.2

type	voltage (V) AC	breaking capacity (A)
2, 3P	380...415	50000

- isolation with positive break indication
- 3-position toggle: open-tripped-closed
- built-in padlocking facility on 3P
- fault display on front face by:
 - fault indicator
 - position of toggle: tripped
- test button to check proper operation of the tripping mechanism
- fast closing

- electrical durability: 10 000 cycles at I_n
- tropicalisation as in IEC 68.1: treatment 2 (relative humidity: 95 % at 55 °C)
- weight (g):

Type	2P	3P
	480	720

- compatible with Pragma 24 and Prisma G enclosures and Prisma P cabinets
- degree of protection: IP20B (IP40D for the part outside the enclosure)
- connection:
 - trip units up to MA63: tunnel terminals for 1.5 to 50 mm² copper cables
 - MA80 trip units: tunnel terminals for 16 to 70 mm² copper cables
 - on 3P, upstream voltage taps on each pole, by 6.35 mm Fast-on lugs, for auxiliary circuit supply.

MA curve

- the magnetic trip units operate at $12 I_n \pm 20 \%$

catalogue numbers



18874



18885

type	trip unit (A)	magn.I (A)	catalogue number	width in mod. of 9 mm
2P				
	MA 4	50	18868	6
	MA 6.3	75	18869	6
	MA 10	120	18870	6
	MA 12.5	150	18871	6
	MA 16	190	18872	6
	MA 25	300	18873	6
	MA 40	480	18874	6
	MA 63	750	18875	6
	MA 80	960	18876	6
3P				
	MA 4	50	18879	9
	MA 6.3	75	18880	9
	MA 10	120	18881	9
	MA 12.5	150	18882	9
	MA 16	190	18883	9
	MA 25	300	18884	9
	MA 40	480	18885	9
	MA 63	750	18886	9
	MA 80	960	18887	9

additional information

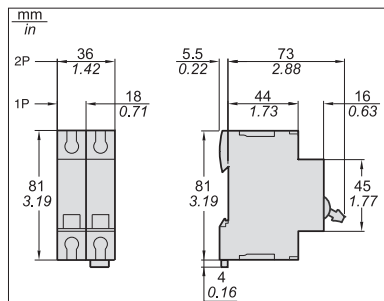
auxiliaries: page A93 to A95
accessories: page A96 to A98
Vigi module: page A39 to A45

discrimination table: p. F23-F49
dimensions: page A108
derating: page F16

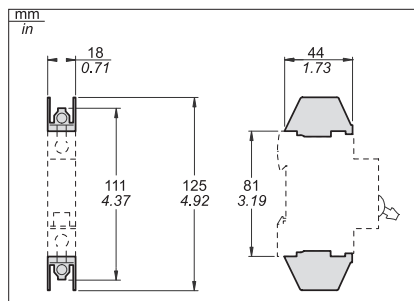
tripping curves: page F5
cascading: page F19 to F22
power loss: page F18

circuit-breakers

C60H-DC

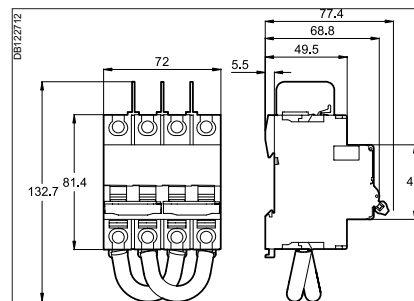


C60H-DC



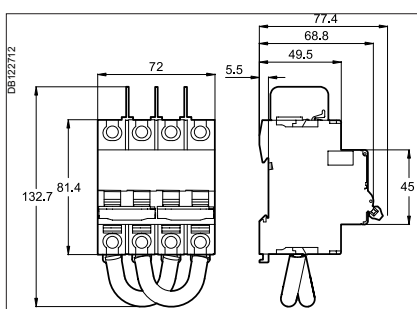
Kit for ring terminals

C60NA-DC



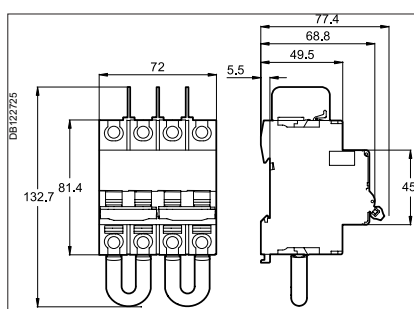
C60NA-DC

C60PV-DC



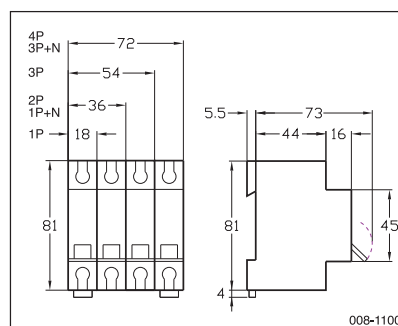
C60PV-DC

SW60-DC



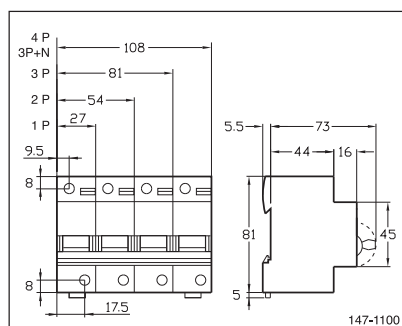
SW60-DC

C60



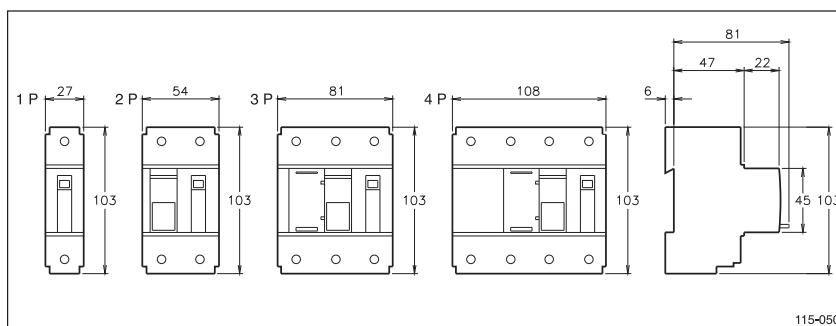
008-1100

C120



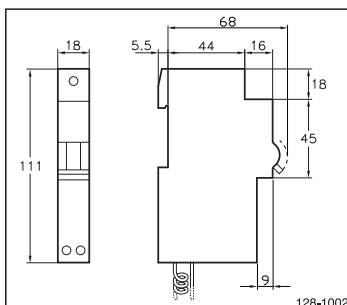
147-1100

NG125



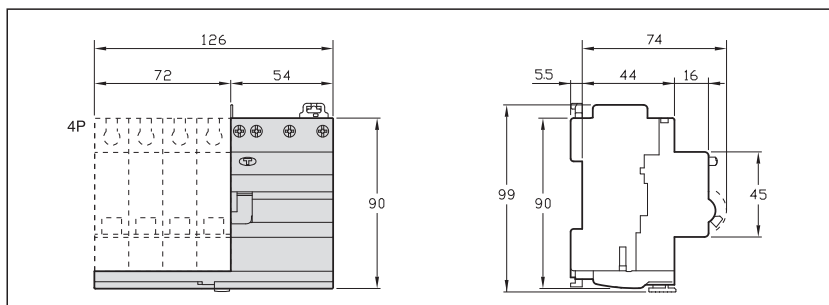
115-0503

earth leakage circuit-breakers
C60H RCBO

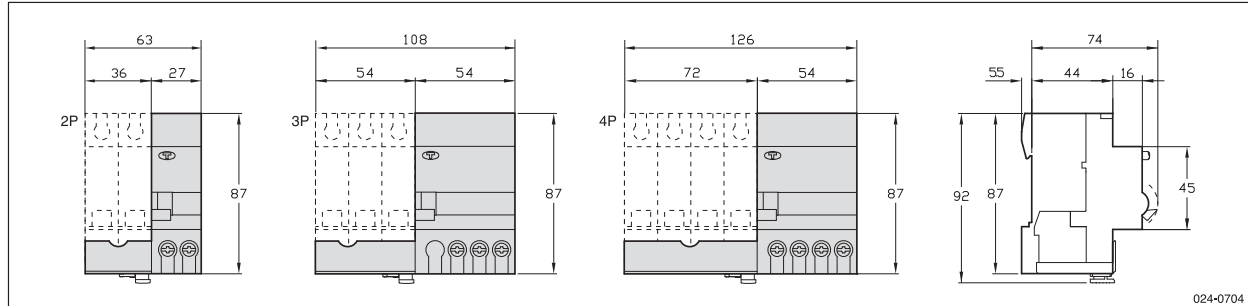


128-1002

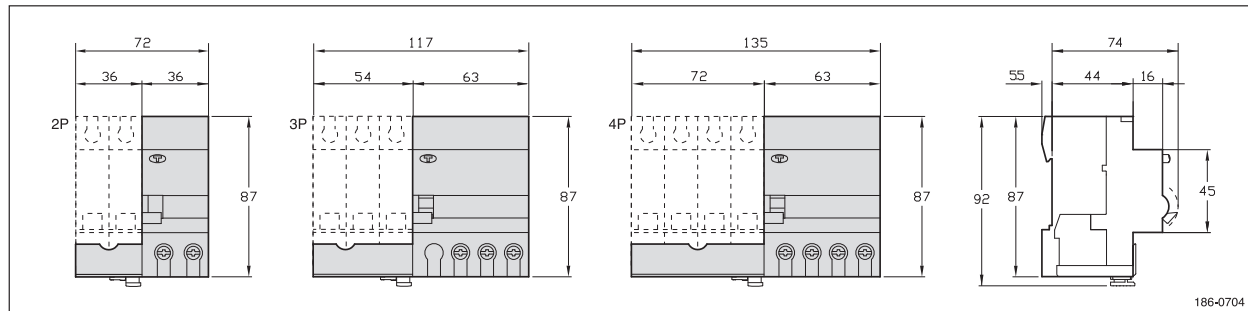
add-on residual current device Group Feeder (mounted)
C60 + vigi C60 c < 63A



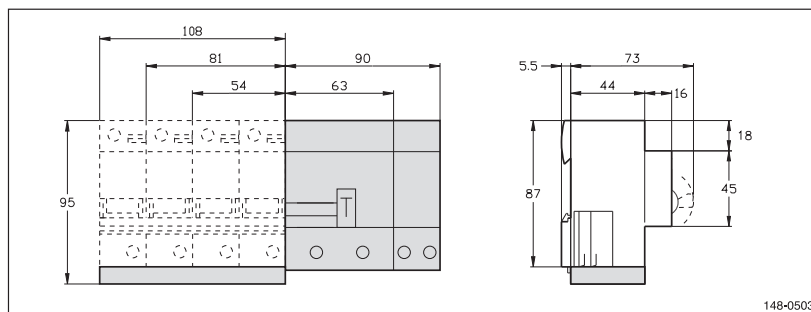
add-on residual current devices Feeder (mounted) (continued)
C60 + vigi C60 < 25A



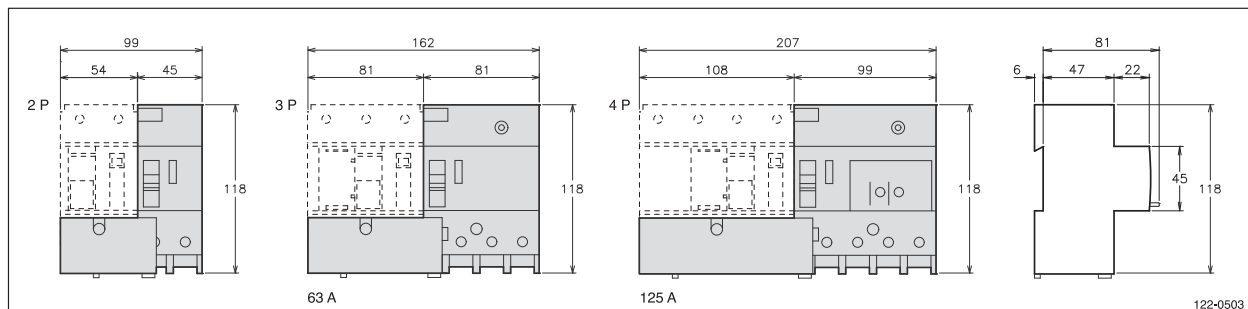
C60 + vigi C60 < 40A and < 63A



C120 + vigi C120

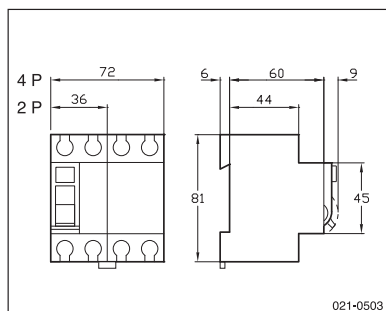


NG125 + vigi NG125

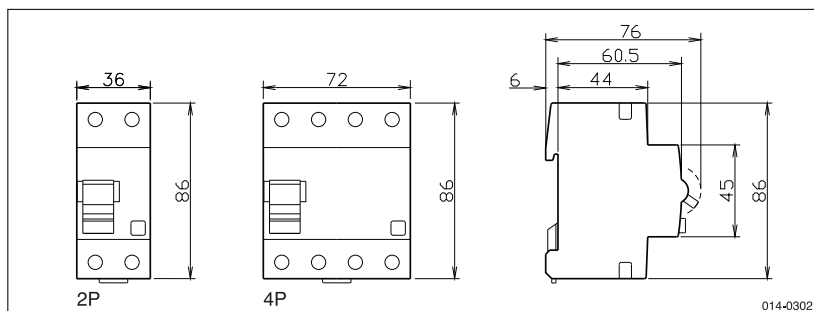


one-piece residual current circuit-breakers

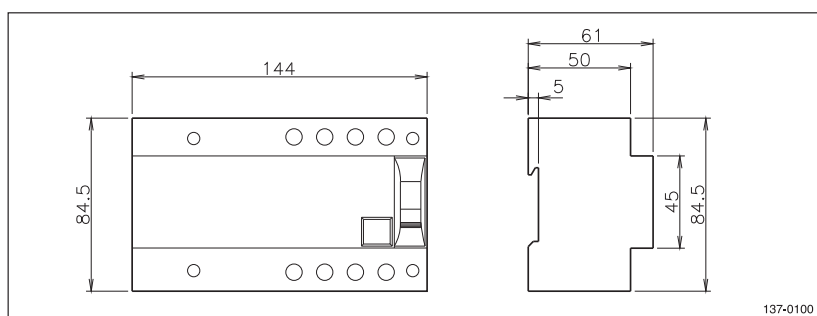
ID / RCCB (16...100A)



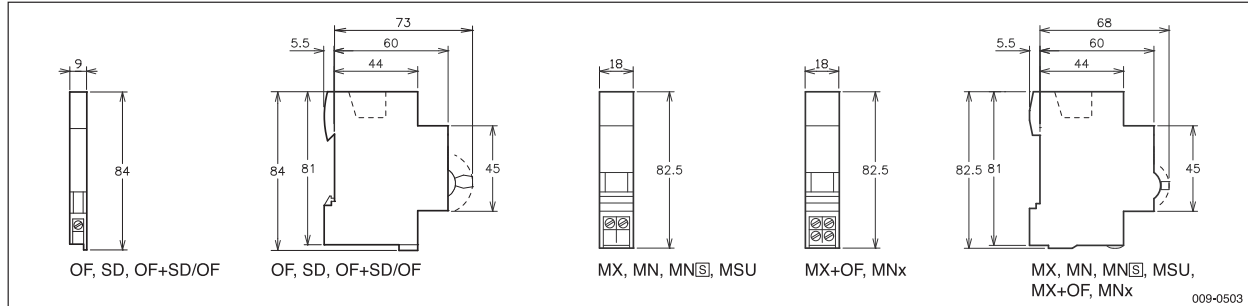
RCCB-ID (100...125A)



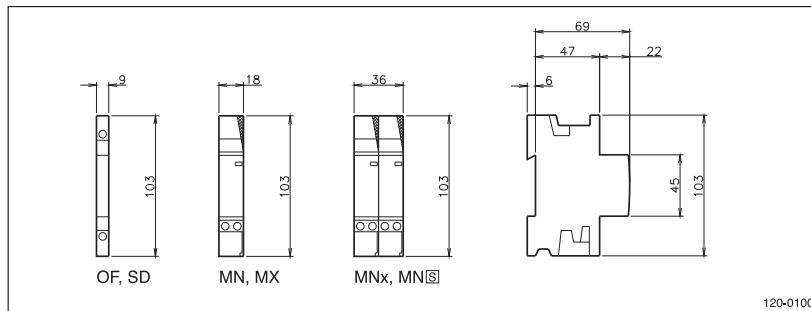
RCCB type B



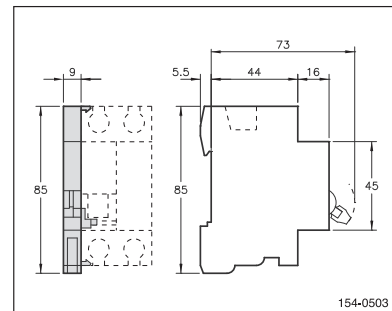
OF, SD, OF+SD/OF - MX, MN, MN $\square$, MSU, MX+OF, MNx for iDPN, C60, C120, ID / RCCB



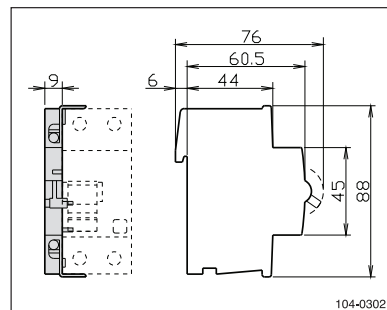
OF, SD, MN, MX, MNx, MN $\square$ for NG125



Ofs for ID / RCCB

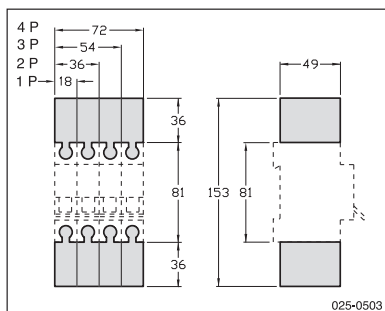


OFsp auxiliary for RCCB-ID
2p/4p (100...125A)

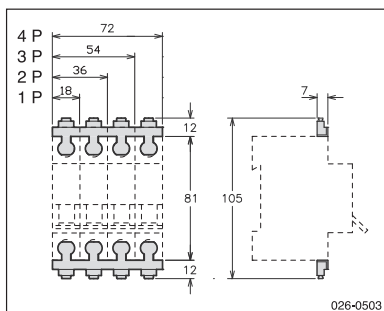


accessories

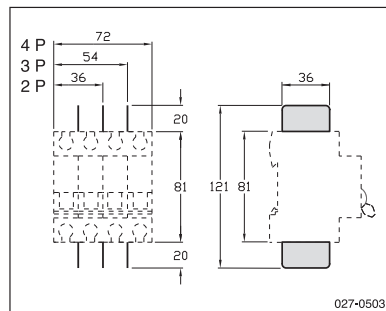
terminal shield C60 / ID-RCCB



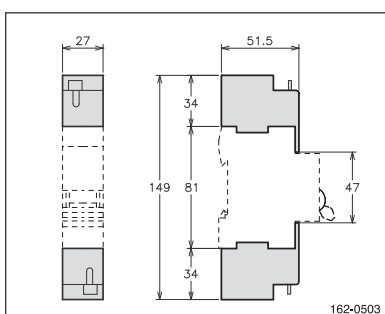
screw shield C60 / ID-RCCB



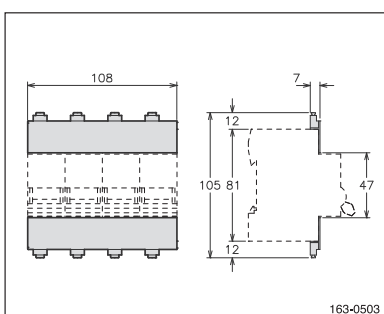
inter-pole barriers C60 / C120 / ID-RCCB



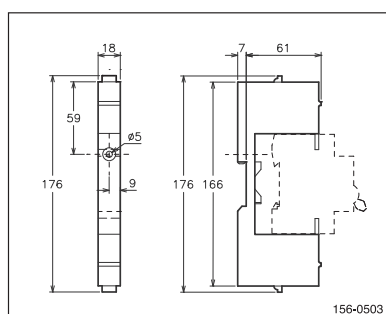
terminal shield C120



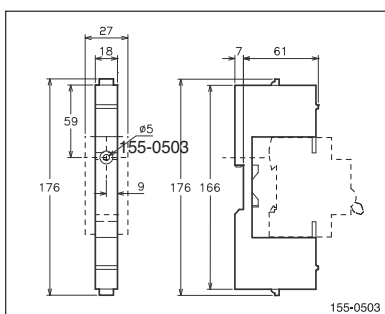
screw shield C120



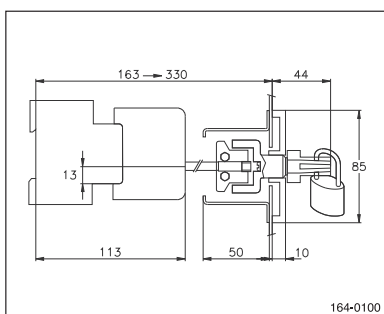
dividable mounting plate C60



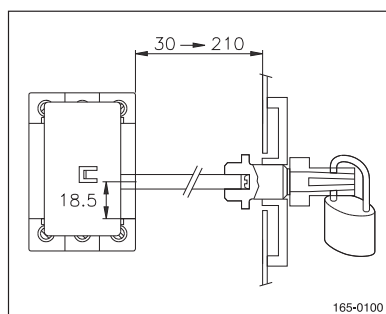
dividable mounting plate C120



rotary handle C60 - C120 front

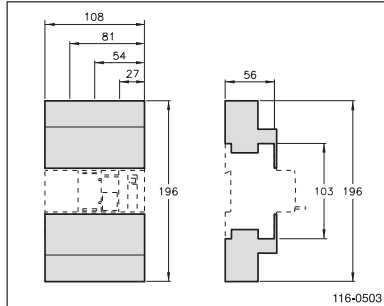


rotary handle C60 - C120 side



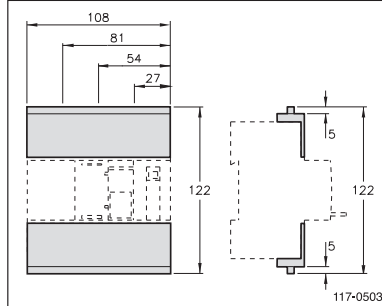
accessories (continued)

terminal shield NG125



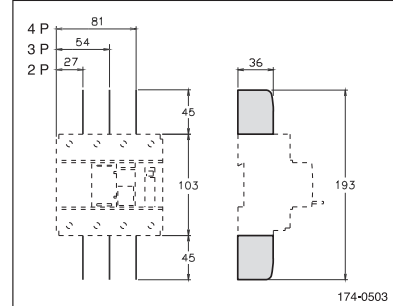
116-0503

screw shield NG125



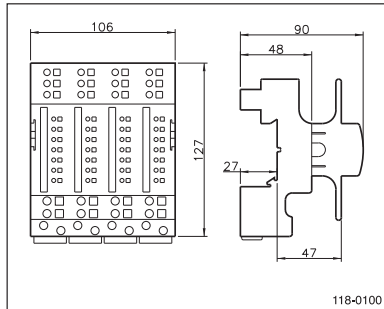
117-0503

inter-pole barriers NG125



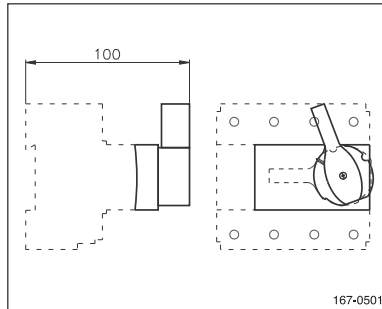
174-0503

distribloc



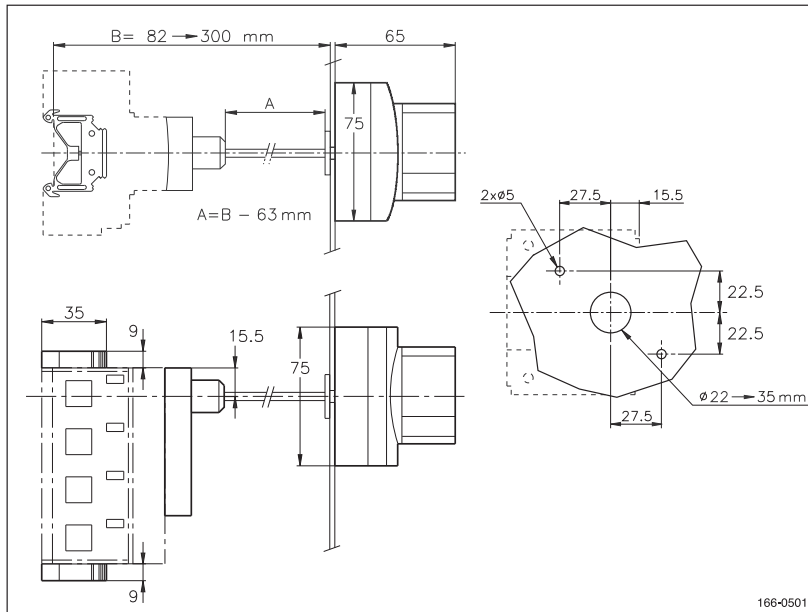
118-0100

direct rotary handle NG125



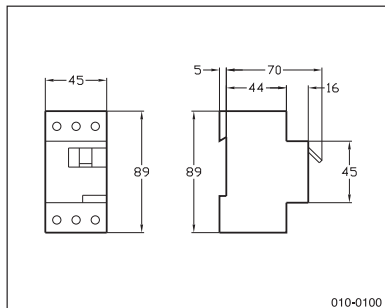
167-0501

extended rotary handle NG125

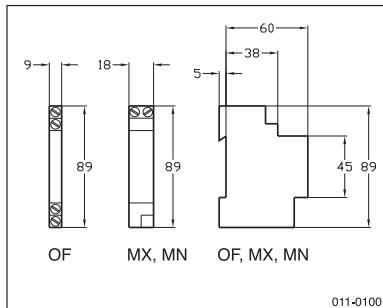


166-0501

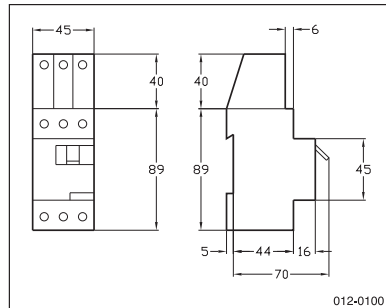
motor protection
P25M



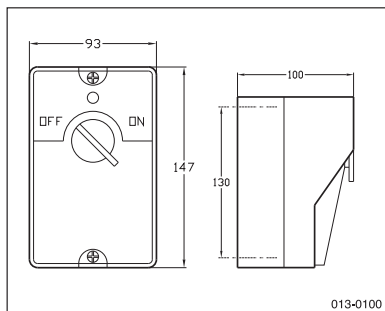
auxiliaries P25M



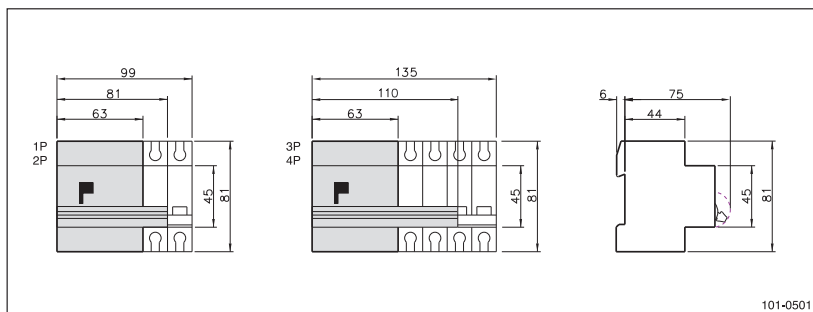
limiter block P25M



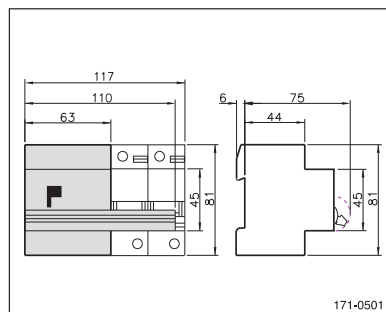
isolation enclosure P25M



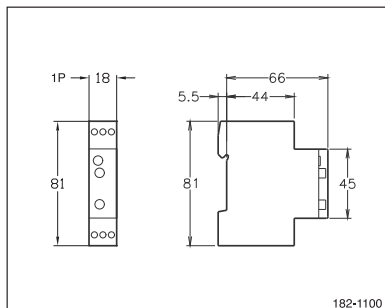
add-on remote controls
Tm C60



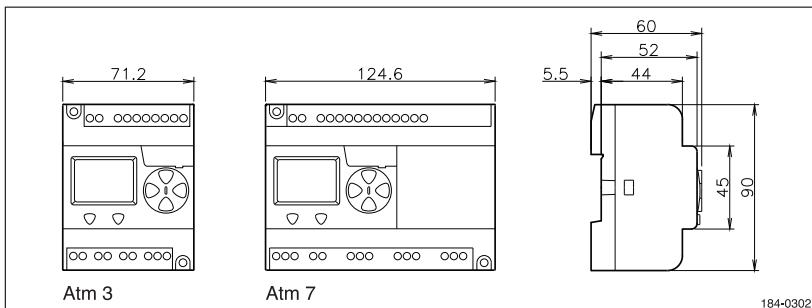
Tm C120 (2p)



Atm



Atm 3 and 7



Command Control

D Command Control

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STI isolatable fuse-carriers

function

STI

The isolatable fuse-carriers provide overload and short-circuit protection and are used in the tertiary and industrial sectors.

fuse-links

aM, gG (gL, gL) types for STI.

indicator light

230 V neon indicator adaptable on STI.

description

STI

common technical data

- isolation of all poles is guaranteed for the 2P, 3P, and 3P+N versions during factory assembly
- positive contact indication
- to be equipped with aM or gG (gL - gL) type fuse-links, with or without fuse blowing indicator

rating (A)	size (mm)	aM fuse	gG fuse
0.5 to 20	8.5 x 31.5		■
1 to 20	10.3 x 38	■	
25 to 32	10.3 x 38		■

- fuse-carrier:
 - captive
 - additional housing is provided for a spare fuse
- optional indication by indicator lights (see accessories)
- connection by tunnel terminals for rigid cables up to 10 mm² and flexible cables up to 6 mm²
- complies with standard IEC 947.3

specific characteristics

STI 1P + N and 3P + N

- disconnection of the phase and neutral in the normal dimensions of the phase (2 mod. of 9 mm).
- phase opening causes compulsory opening of the neutral
- the phase opens before the neutral on isolation and closes after the neutral on circuit closing.

fuse-links

technical data

- aM, gG, (gL - gL) types
- fuse-link without striker pin
- breaking capacity as in the standards NF C 60-200, NF C 63-210 & IEC 269-1/2:

dimensions (Ø x L) (mm)	rating (A)	operat. voltage (V AC)	break.cap. (kA)	aM	gG
8.5 x 31.5	all	380	20	20	
10 x 38	≤ 10	500	80	80	
	25	660	80	80	

- complies with standards NF C60 200 and NF C 63 210

- Véritas and Lloyd's approved

indicator light (option)

technical data

- 230 V AC neon (400 V AC maximum)
- allows indication of fuse blowing (lift after blowing).

catalogue numbers

type	voltage (V)	dimension Ø x L (mm)
------	----------------	-------------------------

STI isolatable fuse-carriers

1P	400	8.5 x 31.5
	500	10.3 x 38



15635	2
15636	2

1P+N	400	8.5 x 31.5
	500	10.3 x 38



15645	2
15646	2

2P	400	8.5 x 31.5
	500	10.3 x 38



15650	4
15651	4



15645

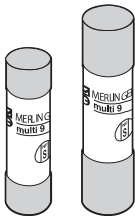


15650

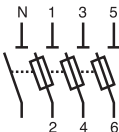
catalogue numbers



15657



15668

type	voltage (V)	dimension Ø x L (mm)	catalogue number	width in mod. of 9 mm
STI isolatable fuse-carriers (continued)				
3P 	400	8.5 x 31.5	15655	6
	500	10.3 x 38	15656	6
3P + N 	400	8.5 x 31.5	15657	6
	500	10.3 x 38	15658	6
aM fuse-links				
8.5 x 31.5	2		15733	
	4		15734	
	6		15735	
	10		15737	
10.3 x 38	2		15742	
	4		15743	
	6		15744	
	10		15746	
	25		15750	
gG (gl, gL) fuse-links				
8.5 x 31.5	2		15767	
	4		15768	
	6		15769	
10.3 x 38	2		15775	
	4		15776	
	6		15777	
	10		15779	
indicator light (1-part blister)				
	230 V AC		15668	

SBI fuse-carriers with indicator light



MGN15707



MGN15714



MGN15712



MGN15718

Function

- SBI fuse holders provide overload and short-circuit protection.
 - They are used for industrial applications requiring a high breaking capacity.
 - They perform the isolation function and must not be used as switches.
 - They are equipped with an indicator light indicating blowing of the fuse cartridge: to be equipped with aM or gG (gL-gI) type fuse cartridge without striker.
- The general purpose fuse (**gG fuse**) provides overload and short-circuit protection. The fuse for motor application (**aM fuse**) only provides short-circuit protection. It is used for protection of loads with a high peak current (motors, transformer primaries, etc.).

Technical data

- Operating frequency: 50 Hz
- Isolation: by tilting its drawer.
- Cartridge blowing signalling: by indicator light ON
- Connection by tunnel terminals:
 - 14 x 51: up to 25 mm²
 - 22 x 58 mm: up to 35 mm²
- Number of 9 mm modules per pole:
 - 14 x 51: 3 modules
 - 22 x 58: 4 modules.
- Insulation voltage: 690 V.
- Operating temperature: -20°C to +60°C.
- Storage temperature: -40°C to +80°C.
- Compliance with standards: IEC EN 60947-3.

Catalogue numbers

Fuse cartridges							SBI fuse holder					
Fuse cartridge type	Rating (A)	Voltage rating Ue (V AC)	Short-circuit current Isc (kA)		Fuse cartridge reference		Network type ⁽¹⁾					
			aM	gG	aM	gG	N	1P	1P+N	2P	3P	3P+N
												
14 x 51	10	690	-	80	-	15787						
	16	690	-	80	-	15788						
	25	690	120	-	15762	-						
	32	500	120	120	15763	15791						
	40	500	120	120	15764	15792						
	50	400	120	-	15765	-						
22 x 58	32	690	-	80	-	15794						
	40	690	80	80	15751	15795						
	50	690	80	80	15752	15796						
	63	690	80	80	15753	15797						
	80	690	80	80	15754	15798						
	100	500	120	-	15755	-						

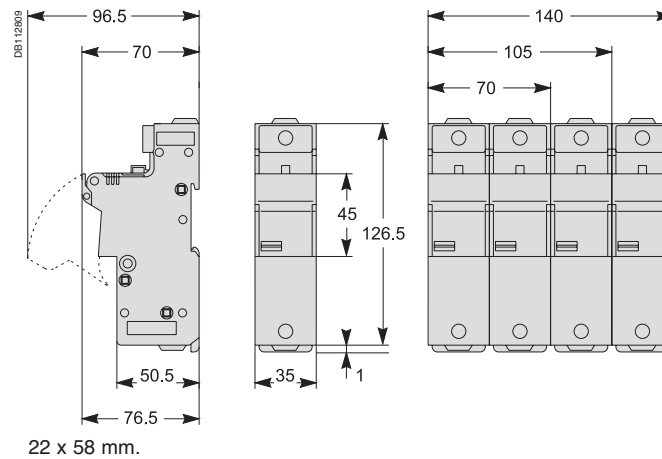
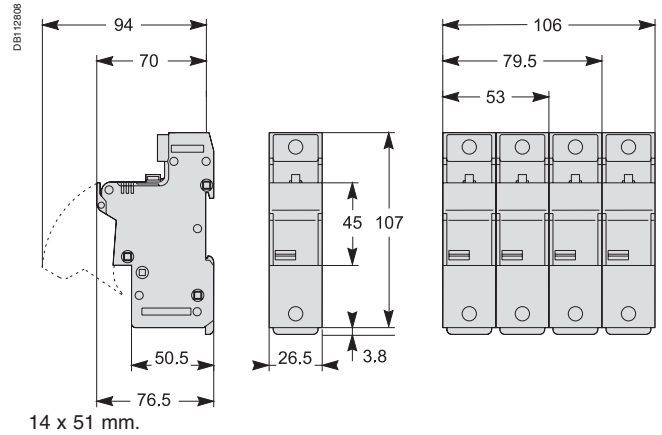
(1) The neutral pole comes equipped with a locked tube.

Connections and tightening torques

Fuse cartridge type	Stripping length	Rigid cable Multi-strand cable Cable with end piece	Rigid multi-cables	Flexible multi-cables or with end piece	Tightening torque	Posidriv
						
14 x 51	10 mm	2.5...25 mm ²	2.5...10 mm ²	2.5...10 mm ²	3.5 N.m	Ø 5 mm
22 x 58	12 mm	2.5...35 mm ²	2.5...25 mm ²	2.5...16 mm ²	3.5 N.m	Ø 6 mm

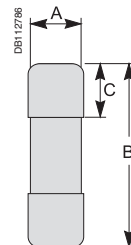
SBI fuse-carriers with indicator light

Fuse holder dimensions



aM, gG fuse dimensions

Fuse type	A	B	C
14 x 51	14.3	51	13.8
22 x 58	22.2	58	16.2



functions

I switches

The I switches combine the following functions:

- control (opening and closing of on-load circuits)
- disconnection

auxiliary

changeover auxiliary switch

Indicates whether the switch is "open" or "closed".

accessories

sealable terminal shield (upstream/downstream)

Makes access to the device terminals impossible.

screw cover

Prevents contact with the device terminal screws.

rotary handle

Enables front or side control of the switches.

padlocking device

Locks the switch in "open" or "closed" position.

Comb busbars

Simplify device powering.

description

I switches

- compliance with standards:
 - I 20, 32, 40 and 63 A: EN 60669-1, IEC 669-1
 - I 40, 63, 100 and 125 A, IEC 947-3:
 - degree of pollution 3
 - isolating voltage 500 V AC
 - impulse voltage 6 kV
 - degree of protection IP 4 on the front panel
 - frequency 50...60 Hz
- isolation with positive contact indication
- USE approved for I 20, 32 and 63 A
- DC application: 48 V (110 V with 2 series-connected poles)
- mechanical endurance:
 - I 20 and 32 A: 200,000 operating cycles
 - I 40, 63, 100 and 125 A: 50,000 operating cycles
- electrical endurance: AC22, p.f. = 0.6
 - I = 20 and 32 A: 30,000 operating cycles
 - I = 40 and 63 A: 20,000 operating cycles
 - I = 100 A: 10,000 operating cycles
 - I = 125 A: 2,500 operating cycles
- short-circuit withstand: 20 x In/1 s
- tropicalisation: treatment 2 (relative humidity 95% at 55 °C)
- connection by tunnel terminals for:
 - 10 mm² flexible/rigid cables for I 20 and 32 A
 - 50 mm² rigid cables or comb busbars, 35 mm² supple cables for I 40, 63, 100 and 125 A
- switch with indicator light:
 - supplied with 230 V neon red indicator light
 - interchangeable indicator light:
 - 12, 24, 48 V AC/DC incandescent bulb (P = 1.2 W)

auxiliary

O.C. auxiliary switch

- contact breaking capacity:
 - 3 A at 400 V AC
 - 6 A at 230 V AC
- fixing by clipping onto symmetrical rail on the left side of the switch
- connection by tunnel terminals for cables up to 10 mm²

accessories

screw covers

- for I 40, 63, 100 and 125 A
- sealable and divisible

rotary handle

- IP549
- composition:
 - a switch operating subassembly
 - a front or side fixed handle (on the right only) or an extended withdrawable handle

padlocking device

- for 8 mm diameter padlock (not supplied) (provide two devices on the outer poles for 3P and 4P devices for I 40, 63, 100 and 125 A)

1P, 2P, 3P and 4P combs

- for I 40, 63, 100 and 125 A
- acceptable current strength at 140 °C
 - 100 A with a central power supply point
 - 125 A with two power supply points

catalogue numbers



15005

type	rating (A)	voltage (V AC)
I switches		
1P	20	250
	32	250
	40	250
	63	250
	100	250
	125	250

catalogue number	width in mod. of 9 mm
15005	2
15009	2
15024	2
15013	2
15090	2
15057	2

I switches 20 to 125 A and auxiliary

catalogue numbers



15014



15092



15093



15100

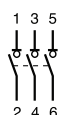


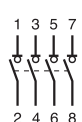
15096

type	rating (A)	voltage (V AC)	catalogue number	width in mod. of 9 mm
------	---------------	-------------------	---------------------	-----------------------------

I switches

2P 	20	415	15006	2
	32	415	15010	2
	40	415	15020	4
	63	415	15014	4
	100	415	15091	4
	125	415	15058	4

3P 	20	415	15007	4
	32	415	15011	4
	40	415	15023	6
	63	415	15015	6
	100	415	15092	6
	125	415	15059	6

4P 	20	415	15008	4
	32	415	15012	4
	40	415	15019	8
	63	415	15016	8
	100	415	15093	8
	125	415	15060	8

switch with 230 V indicator light

1P	20	250	15063	2
	32	250	15100	2

2P	20	250	15064	2
	32	250	15101	2

auxiliary

O.C. auxiliary switch	15096	2
-----------------------	-------	---

function

The NG125NA is a trip-free switch-disconnector for on-load opening and closing. It is particularly suitable for the modular enclosure incoming function with remote opening (e.g. emergency breaking) or earth leakage protection function.

This modular device has the same auxiliary functions and accessories as the NG125 circuit-breaker:

- Vigi NG125 module for earth leakage protection;
- OF + SD auxiliary contact;
- MX or MN releases;
- various connection types (80, 100 and 125 A ratings);
- rotary handle.

common technical data

- ratings: 63...125 A
- maximum voltage rating U_e : 500 V AC
- performance as in EN 60947.3.
- short-time withstand current (50 ms) I_{cw} : 1.5 kA
- maximum making capacity: see co-ordination table
- maximum insulation voltage U_i : 690 V
- impulse voltage U_{imp} : 8 kV
- electrical durability:

voltage	category	63/80A	100/125A
500 V AC	AC22B	1500	1000
440 V AC	AC22B	1500	1000
415 V AC	AC22A-AC23B	1500	1000
125 V DC (2P series)	DC22A	1500	1000
250 V DC (4P series)	DC22A	1500	1000

- isolation with positive break indication
- built-in padlocking facility
- weight (g):

type	3P	4P
	720	960

- compatible with Pragma or Prisma Plus G or P modular enclosures

- connection: tunnel terminals for flexible and rigid copper cables up to 70 mm²

catalogue numbers



18891



18895

type	rating (A)	catalogue number	width in mod. of 9 mm
NG125NA			
3P 	63	18889	9
	80	18890	9
	100	18891	9
	125	18892	9
4P 	63	18893	12
	80	18894	12
	100	18895	12
	125	18896	12

additional information

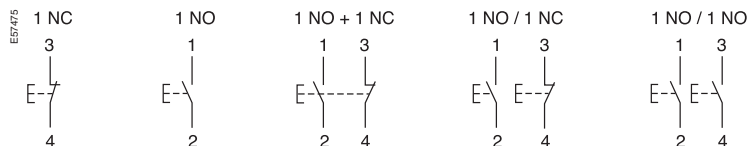
auxiliaries: page A93 to A95
power loss: page F18
cascading: page F19 to F22

accessories: page A96 to A98
Vigi module: page A39 to A45
discrimination table: page F23-F49

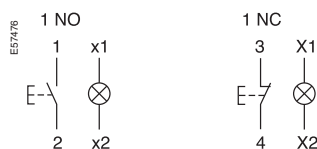
dimensions: page A108
tripping curves: page F5
derating: page F16

The BP pushbuttons are used for impulse-type controls.

The BP pushbutton range offers the following control contact types:
BP:



BP with indicator light:



Technical data

- voltage rating: 250 V AC
- current rating: 20 A
- electrical durability: 30 000 switching operations AC22 (cos φ = 0.8)
- complies with standard: IEC 60669-1 and IEC 60947-5-1
- indicator light with LED technology:
 - consumption : 0.3 W
 - service life: 100,000 hours with constant luminous efficiency
 - indicator light requires no maintenance (non-interchangeable LEDs)
- operating temperature: -20°C...+50°C
- storage temperature: -40°C...+80°C
- tropicalisation: treatment 2 (relative humidity: 95 % at 55°C)
- connection by rigid or flexible cable with or without cable end:
 - tunnel terminals up to 2 x 2.5 mm², +/- recess screw, Pozidriv n°1
 - staggered terminals simplifying cable connection.

18032



18035



18036



type	width in mod. of 9 mm	colour BP	circuit	catalogue number
single BP				
2		grey	1NC	18030
		red	1NC	18031
		grey	1NO	18032
		grey	1NO+1NC	18033

double BP				
2		green/red	1NO / 1NC	18034
		grey/grey	1NO / 1NO	18035

type	width in mod. of 9 mm	power light	colour	colour BP	circuit	catalogue number
single BP + indicator light						
2	110...230 V AC	green	grey	1NO	18036	
		red	grey	1NC	18037	
	12...48 V AC/DC	green	grey	1NO	18038	
		red	arev	1NC	18039	

Function

They can be attached to a symmetrical 35 mm rail, in modular cabinets or enclosures, for control and indications auxiliaries: push-buttons, emergency stops, switches, light indicators; for tertiary and industrial applications.

Description

Button holder

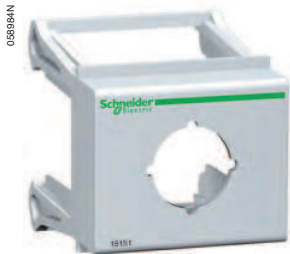
- for buttons, switches and indicators with metal or plastic flange $\varnothing$ 22 of the Telemecanique XB4 / XB5 type
- depth under rail 60 mm (same as products in the multi 9 range)
- drilling diameter: $\varnothing$ 22.3
- self-extinguishing insulating material
- colour: light grey RAL 7035.

Universal holder

- for buttons, indicators, light emitting diodes (LED), potentiometers
- easy drilling, to be adapted depending on use
- depth under rail 60 mm (same as products in the multi 9 range)
- self-extinguishing insulating material
- colour: light grey RAL 7035.

Catalogue numbers

type	catalogue	width in mod. of 9mm
button holders		
$\varnothing$ 22 holder	15151	6
universal holder	15152	6



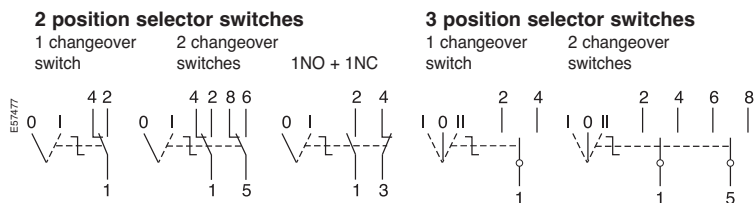
15151



15152

The CM linear selector switches allow manual control of electric circuits.

The CM selector switch range offers the following control types:



Technical data

- Voltage rating: 250 V AC.
- Current rating: 20 A.
- Electrical durability: 30,000 cycles AC22.
- Complies with standard: IEC 60669-1 and IEC 60947-5-1.
- Operating temperature: -20°C...+50°C.
- Storage temperature: -40°C...+80°C.
- Tropicalisation: treatment 2 (relative humidity 95 % at 55°C).
- Connection by rigid or flexible cable with or without cable end:
 - tunnel terminals up to 2 x 2.5 mm², +/- recess screw, Pozidriv n°1
 - staggered terminals simplifying cable connection.



Type	width in mod. of 9 mm	Contact	Cat. no.
2 positions CM			
2		1 changeover switch	18070
4		2 changeover switches	18071
2		1 NO + 1 NC	18072

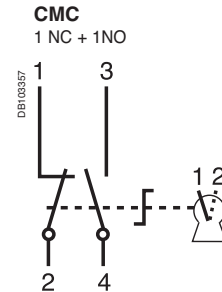
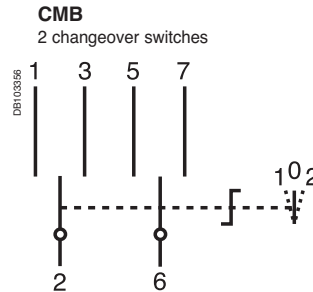
3 positions CM			
2		1 changeover switch	18073
4		2 changeover switches	18074

Rotary selector switches CMB, CMC, CMD and CME allow manual control of electric circuits.

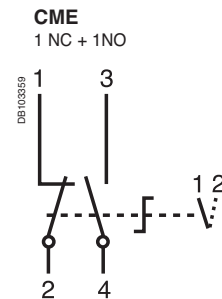
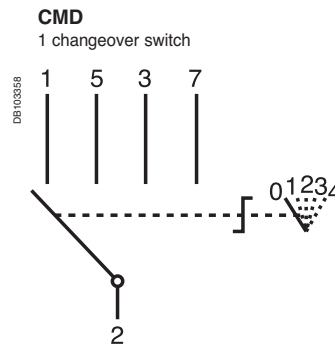
The rotary selector switch range CMB, CMC, CMD and CME offers the following control types:



CMB



CMC



CMD

CMB

This 2-pole selector switch with reset manually controls a circuit with two operating directions with an OFF position.

For example: Electrically controlled metal curtain

Position 1 = up

Position 0 = OFF

Position 2 = down.

CMC

This 2-position changeover switch (ON-OFF) with key-lock, allows locking in either position.

CMD

This 4-direction selector switch controls a circuit with operating priorities.

For example: fan control

Position 0 = OFF

Position 1 = "ON" override, low speed

Position 2 = "ON" override, high speed

Position 3 = remote control

Position 4 = automatic operation.



CME

CME

This 2-position changeover switch is used specially to control electronic circuits with a low voltage and current level.

CMB, CMC, CMD and CME common technical data

- Rotary handle.
- Maximum operating voltage: 440V, 50/60 Hz.
- Nominal thermal current: 10 A.
- Operating temperature: -20°C to +55°C.
- Storage temperature: -25°C to +80°C.
- Mechanical durability (AC21A-3x440 V): 2 000 000 operations.
- Electrical durability: 1 000 000 operations.
- Connection: jumper terminals with captive screw, for cables up to 1.5 mm².
- Complies with standards:
 - IEC 60947-3 (EN 60947-3)
 - VDE 0660 part. 107
 - UL.

CME specific technical data

Voltage range 1 V-440 V AC/DC:

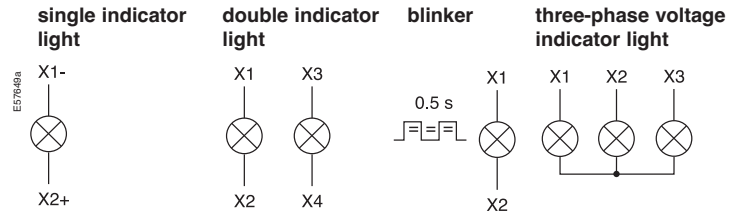
Breaking capacity	
AC	DC
Resistive load with small loads	Resistive load $T \leq 1$ ms
1 V/5 A	1 V/3 A
12 V/1.2 A	12 V/0.7 A
24 V/0.7 A	24 V/0.4 A
48 V/0.45 A	48 V/0.25 A
110 V/0.25 A	110 V/0.13 A
240 V/0.15 A	240 V/0.08 A
300 V/0.13 A	300 V/0.07 A
440 V/0.1 A	440 V/0.05 A

Catalogue numbers

Type	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
CMB	10	415	4	15120
CMC	10	415	4	15123
CMD	10	415	4	15121
CME	see above the CME specific technical data		4	15122

The V indicator lights are used for luminous indication.

The V indicator light range consists of:



Technical data

- complies with standard IEC 60947-5-1 (excepted cat. n° 18327 complies with standard IEC 73 and IEC 1000-4)
- operating frequency: 50...60 Hz
- indicator light with LED technology:
 - consumption by indicator light: 0.3 W (0.5 W for cat. n° 18327)
 - service life: 100,000 hours with constant luminous efficiency
 - indicator light requires no maintenance (non-interchangeable LEDs)
- blinker frequency: 2 Hz
- degree of protection:
 - IP4/IPxxD for the part outside the enclosure
 - IP2/IPxxB at the terminals
- divisible partition for the teeth of any comb busbar to fit into
- degree of pollution: 3 (2 for cat. n° 18325)
- operating temperature: -20 °C...+50 °C
- storage temperature: -40 °C...+100 °C
- tropicalisation: treatment 2 (relative humidity 95 % at 55 °C)
- connection by rigid or flexible cable with or without cable end:
 - tunnel terminals up to 2 x 2.5 mm², +/- recess screw, Pozidriv n°1
 - staggered terminals simplifying cable connection.

18321



18325



18326



pb10785-13



Type	Width in mod. of 9 mm	Colour	Catalogue number 110...230 V AC	Catalogue number 12...48 V AC/DC
Single indicator light				
2		Red	18320	18330
		Green	18321	18331
		White	18322	18332
		Blue	18323	18333
		Yellow	18324	18334

Double indicator light				
2		Green/red	18325	
2		White/white	18328	
2		Green/red		18335

Blinker				
2		Red	18326	

Type	Width in mod. of 9 mm	Colour	Catalogue number 230...400 V AC 3-phase
Three-phase voltage indicator light			
2		Red/red/red	18327

functions

SO and RO

Audible indication in housing and the tertiary sector.

description

SO and RO

- sound level (at a distance of 60 cm):
 - RO buzzer: 70 dBA
 - SO bell: 80 dBA
 - frequency :50...60 Hz
- consumption:
 - 3.6 VA: 8...12 A
 - 5 VA: 220...240 V
- connection: tunnel terminals for cables up to 4 mm²

catalogue numbers



15320



15322

type	voltage (V AC)	catalogue number	width in mod. of 9 mm
SO bell			
	230	15320	2
	8...12	15321	2
RO buzzer			
	230	15322	2
	8...12	15323	2



15212



15218

Note: Transformers have an off load operating voltage that is higher than the rated voltage. For loads that are sensitive to overloads (electro-magnetic circuits), the transformer must be made to operate at In. After operation of the protection device upon an overload, cut-off the power supply and let the transformer cool down before restart.

- Frequency: 50/60 Hz
- Compliance with standards: NF EN 60742, EN and IEC 61558-2-6.
- Approval NF USE.
- Connection: tunnel terminals for cables up to 4 mm².

Function

Bell transformers and safety transformers allow for a very low voltage (ELV 8 V, 12 V or 24 V) to be obtained from a low voltage network (LV 230 V).

Description

All Multi 9 transformers are:

- safe: primary and secondary circuits are perfectly insulated by each other.
- resistant to short-circuit currents thanks to the built-in device.
- class II with terminal shield (optional).

Technical data

- Primary voltage: 230 V AC ± 10 %.
- Secondary voltage on load:
 - 8-12-24 V AC ± 15 % for bell transformers
 - 12-24 V AC ± 5 % for safety transformers.

Transformer catalogue numbers	Rated secondary voltage (V)	Off load voltage (V)
15214	8	12
15213	8	12
	12	16
15216	8	13
	12	18
15212	8	13
	12	18
15215	12	16
	24	32
15218	12	14
	24	28
15219	12	14
	24	28
15220	12	14
	24	28
15222	12	14
	24	28

Catalogue numbers

Type	Power	Secondary	Width in mod. of 9mm	Cat. no.
Bell transformer				
	4	8	4	15214
	4	8-12	4	15213
	8	8-12	4	15216
	16	8-12	4	15212
	25	12-24	6	15215
15214 15212-15213-1521 15215				
Safety transformer				
	16	12-24	10	15218
	25	12-24	10	15219
	40	12-24	10	15220
	63	12-24	10	15222
15218-15219 15220-15222 15220-15222				
Terminal shield				
			4	15228
			6	15229
			10	15230



15307



15310



15324



15303



15312

PC 16 A sockets

Function

Connect LV equipment to the electrical network.

Catalogue numbers

Type		Width in mod. of 9 mm	Rating (A)	Cat. no.
Socket with blanking plate	2P+E	5	16	15306
	2P+E + indicator light	5	16	15307
	Red differentiated socket with blanking plate	5	16	15324
German standard socket ⁽¹⁾	2P+E	5	16	15310
	2P+E + indicator light	5	16	15035
Italian standard socket ⁽²⁾ with blanking plate	2P+E	5	16	15303

Technical data

Compliance with standards	IEC 60-884 NF C 61-314 NF C 15-100 (sockets with "baby safe" type blanking plate) (1) German standard: VDE 0620 (2) Italian standard: IMQ as per standard IEC 23-16
Voltage rating	250 V AC
Mounting	On symmetrical rail
Connection by tunnel terminals	Flexible 6 mm ² or rigid 10 mm ² cable
Voltage presence indicator light	Long life LED technology: 100,000 hours

Note the differentiated socket is designed for specific applications (backed-up networks, sockets supplied by UPS, etc.), when there is a desire to highlight specialised power sockets. Its red colour allows users to single it out and identify it easily.

PC 20 A socket

Function

Connect LV equipment to the electrical network.

Catalogue numbers

Type		Width in mod. of 9 mm	Rating (A)	Cat. no.
Socket with blanking plate	2P+E	8	20	15311
	3P+E	8	20	15312
	3P+N+E	8	20	15313

Technical data

Compliance with standards	NF C 61-316 NF C 15-100 (sockets with "baby safe" type blanking plate)
Voltage rating	400 V AC
Mounting	On symmetrical rail
Connection by tunnel terminals	Flexible 10 mm ² or rigid 16 mm ² cable

Note: the three-phase sockets cannot be installed in weatherproof enclosures of the Pragma type.

Impulse relays are used for control by pushbuttons of lighting circuits:

- incandescent lamps, low voltage halogen lamps, etc, (resistive loads)
- fluorescent tubes, discharge lamps, etc, (inductive loads).

The range of Merlin Gerin impulse relays consists of:

- TL+: high performance impulse relay
- TL: impulse relays with auxiliaries
- TLI: changeover impulse relays with auxiliaries
- TLc, TLM, TLa: impulse relays with built-in auxiliary functions.

Choice of impulse relays

		Impulse relays TL+ high performance
Rating	A	16
Control voltage	V AC	230
	V DC	
		TL+
Number of poles	1P	-
	1P+N	■
	2P	-
	3P	-
	4P	-
Additional data		
Noise		dB1020/59
Disturbance		dB1020/61
Control type	Local on device	3-position illuminated PB
	Remote	Illuminated PB
Electrical durability	AC21	5 000 000
	AC22	5 000 000

PB = pushbutton.

Impulse relays choice table

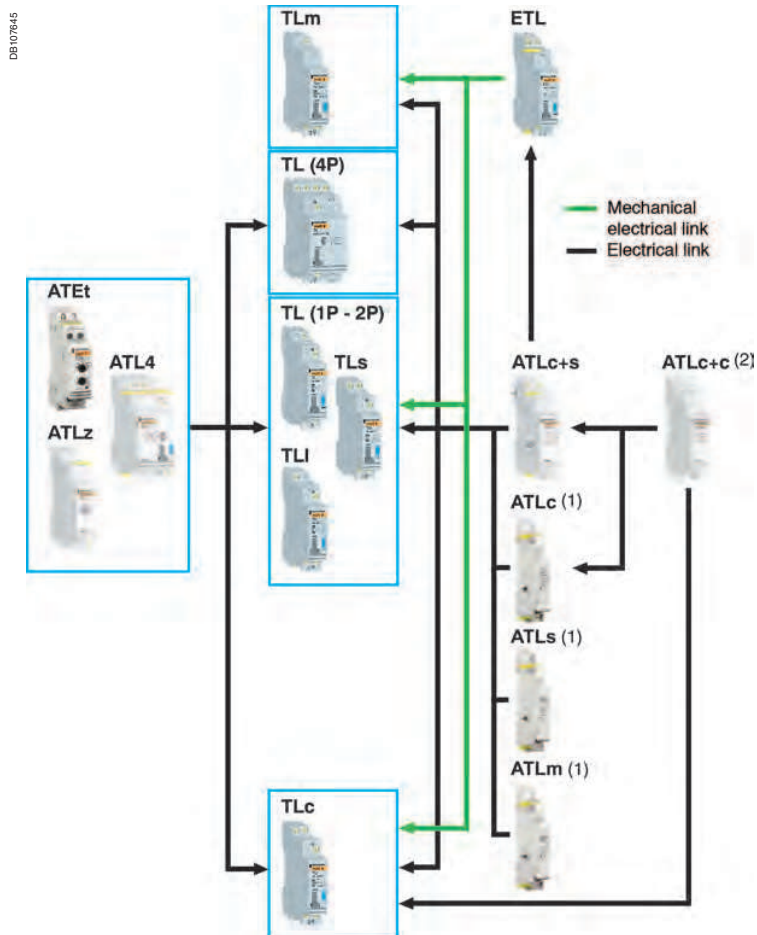
Standard TL		Changeover TLI		Impulse relays with built-in auxiliary function					
				TLC centralised control		TLM control on latched order		TLS remote indication	
16		32		16		16		16	
230-240	130 48 24 12	230-240	230-240 48 24	230-240	48 24	230-240		230-240	48 24
110	48 24 12 6		110 24 12			110		110	24 12
TL	TL+ETL	TL	TL+ETL	TL	TLI+ETL	TLC	TLC+ETL	TLM	TLM+ETL
■	-	■	-	■	-	■	-	■	-
-	-	-	-	-	-	-	-	-	-
■	-	■	-	■	-	-	■	-	■
■	■	-	■	-	■	-	■	-	■
■	■	-	■	-	■	-	■	-	■

Graph 1: TL (dB) vs t. The TL signal is a sharp peak followed by a decay. The TLI signal is a square wave pulse.

Graph 2: U vs t. The U signal is a sinusoidal wave. The TLI signal is a square wave pulse.

O-I toggle	O-I toggle	O-I toggle	O-I toggle	O-I toggle	O-I toggle
Illuminated PB	Illuminated PB	Illuminated PB	PB	Changeover	Illuminated PB
200 000	50 000	200 000	200 000	200 000	200 000
100 000	20 000	100 000	100 000	100 000	100 000

Impulse relay auxiliarisation principle



(1) The ATLC, ATLS and ATLM 9 mm auxiliaries are used by themselves to the right of an impulse relay.

(2) *Connection by traditional cabling.*

		Impulse relays TL+ high performance
Rating	A	16
Control voltage	V AC V DC	230
Auxiliary		
Extension	ETL	
Centralised control + indication	ATLC+S ⁽²⁾ (3)	
Multi-level centralised control	ATLC+C ⁽³⁾	
Centralised control	ATLC ⁽¹⁾ (3)	
Indication	ATLs ⁽¹⁾	
Latched control	ATLm ⁽¹⁾	NO auxilisation
Control for illuminated PB	ATLz	
Step by step control	ATL4	
Time delay control	ATet	

Notes: (1) The ATLC, ATLS and ATLM 9 mm auxiliaries are used by themselves to the right of an impulse relay.
(2) The ATLC+c must be mounted to the right of an ATLC+s or an ATLC.

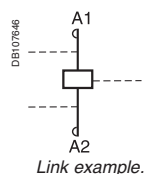
(3) The centralised control functions (TLC, ATLC, ATLC+s, ATLC+c) only operate on AC voltage networks.

(4) ATET: control voltage; V AC: 24...240, V DC: 24...110.

Impulse relays choice table

	Standard TL						Changeover TLI				Impulse relays with built-in auxiliary function						
											TLc centralised control		TLm control on latched order		TLs remote indication		
	16						32	16				16		16		16	
	230-240	130	48	24	12	230-240	230-240	48	24	230-240	48	24	230-240	230-240	48	24	
	110	48	24	12	6		110	24	12				110	110	24	12	
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	■	■	■	■	-	■	■	■	■	-	-	-	-	■	■	■	
	■	■	■	■	-	■	■	■	■	■	■	■	-	■	■	■	
	■	■	■	■	-	■	■	■	■	-	-	-	-	■	■	■	
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
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	■	-	-	-	-	■	■	■	-	■	■	-	-	■	■	-	
	■	■	-	-	-	■	■	■	-	■	■	-	-	■	■	-	
	■	■	■	□ ⁽⁴⁾	-	■	■	■	□ ⁽⁴⁾	■	■	■	-	■	■	□ ⁽⁴⁾	

Accessories



Yellow clips

Ensure the mechanical link (indicated in dotted lines on diagrams), the electrical link between impulse relays and extension and/or auxiliaries.

The TL+ high performance impulse relay allows remote control of single-phase circuits.

It is intended for demanding applications.

The TL+ allows high performance, in particular in terms of the number of switching operations, equivalent performance with all lamp types, minimum noise, absence of electromagnetic disturbances.

It combines the advantages of static switching and electromechanical technology: compact size, minimum temperature rise.

Operation

The TL+ high performance impulse relay has a normally open contact and is controlled by impulse type electrical orders.

- One or more control points are possible.
- On the front face, an orange indicator light comes on when the output contact is closed.

The TL+ impulse relay has a pushbutton on its front face allowing selection of the operating mode. A green indicator light indicates the current mode:

- ON/OFF control by room-mounted pushbutton (green light ON)
- "ON" override (green light flashing)
- "OFF" override (light OFF).

After a mains power outage, the TL+ returns to position 0, whatever its initial state.

Technical data

Voltage rating	230 V AC ($\pm 10\%$), 50 Hz
Inrush power	11 VA
Holding power	1.1 VA
Impulse duration	50 ms (recommended value for automation system: 200 ms)
Control by illuminated pushbutton	Max. consumption 5 mA
Maximum switching frequency	6 switching operations/minute
Noise level on energisation	< 30 dBA
Characterisation on load types	No derating
Electrical durability	5,000,000 cycles
Compliance with standard	EN 669-2-2
Approval	NF
Operating temperature	-5 °C to +55 °C
Connection by tunnel terminals for flexible and rigid cables	Up to 2 x 1.5 mm ² with end 2 x 2.5 mm ² without end 1 x 4 mm ² without end

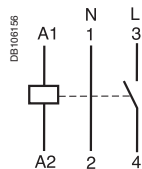


TL+



Spacer

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
TL+ 16 A			
1P+N	2+1 ⁽¹⁾	230	15032



⁽¹⁾ Comes with a 9 mm spacer (cat. no. 27062): to be used in case of mounting of the TL+ next to a circuit-breaker, contactor, impulse relay, etc. to guarantee optimum use.

⚠ The same phase must be used for power and control connection.

16 A TL and TLI impulse relays

Operation

Closing of the impulse relay pole(s) is triggered by an impulse on the coil.

Equipped in the factory with two stable mechanical positions, the pole(s) will be opened by the next impulse. Each impulse received by the coil reverses the position of the pole(s).

- Manual controls on front face:
 - direct and priority manual control by O-I toggle
 - disconnection of remote control by selector switch (except for single-piece TL)
- Indication: mechanical on front face by toggle position.

Technical data

Rating	16 A, $\cos \varphi = 0.6$
Voltage rating	1P and 2P: 250 V, 50/60 Hz 3P, 4P: 415 V, 50/60 Hz
Inrush power	1P and 2P: 19 VA 3P, 4P: 38 VA
Remote control	By pushbutton (illuminated up to 3 mA)
Control voltage (Uc)	Tolerance at 50 Hz: $U_c \pm 6\% -15\%$ Tolerance at 60 Hz: $U_c \pm 6\%$ Tolerance in DC: $+6\% -10\%$
Impulse duration	50 ms (recommended value for automation system: 200 ms)
Maximum switching frequency	5 switching operations/minute
Noise level on energisation	≤ 60 dBA (at 1 m)
Electrical durability	200,000 cycles (AC21) 100,000 cycles (AC22)
Operating temperature	-20 °C to +50 °C
Tropicalisation	Treatment 2 (relative humidity 95 % at +55 °C)
Connection	Screw "±", Posidriv
Connection terminals	Power circuit: tunnel terminals for cables up to 10 mm ² Control circuit: tunnel terminals for 0.5 to 6 mm ² cables
Compliance with standard	EN 669-1, EN 669-2-2
Approvals	NF, CEBEC, IMQ, VDE, GOST



15510



15158

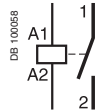


15520 + 15530

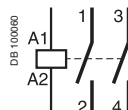


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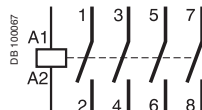
Type	Width in mod. of 9 mm	Coil voltage U _c (V AC) (V DC)		Cat. no.
16 A TL impulse relays				
1P	2	230...240	110	15510
		130	48	15511
		48	24	15512
		24	12	15513
		12	6	15514



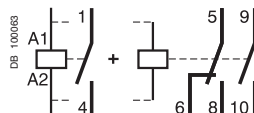
2P	2	230...240	110	15520
		130	48	15521
		48	24	15522
		24	12	15523
		12	6	15524



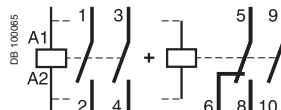
4P	4	230...240	110	15155
		24	12	15158



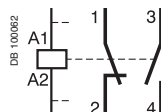
16 A TL impulse relays + ETL				
3P	2+2	230...240	110	15510 + 15530
		130	48	15511 + 15531
		48	24	15512 + 15532
		24	12	15513 + 15533
		12	6	15514 + 15534



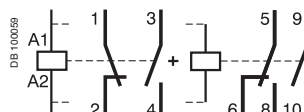
4P	2+2	230...240	110	15520 + 15530
		130	48	15521 + 15531
		48	24	15522 + 15532
		24	12	15523 + 15533
		12	6	15524 + 15534



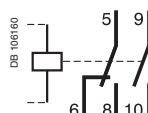
16 A TLI impulse relays				
1P - 2P	2	230...240	110	15500
		48	24	15502
		24	12	15503



3P - 4P	2+2	230...240	110	15500 + 15530
		48	24	15502 + 15532
		24	12	15503 + 15533



ETL extensions for 16 A TL and 16 A TLI				
	2	230...240	110	15530
		130	48	15531
		48	24	15532
		24	12	15533
		12	6	15534



Accessories				
Set of 10 clips				15415

Auxiliarisation: ATet, ATLz, ATL4, ATLC+s, ATLC+c, ATLC, ATLS, ATLM.

TL 32 A impulse relays

Operation

Closing of the impulse relay pole(s) is triggered by an impulse on the coil. Equipped in the factory with two stable mechanical positions, the pole(s) will be opened by the next impulse. Each impulse received by the coil reverses the position of the pole(s).

- Manual controls on front face:
 - direct and priority manual control by O-I toggle
 - disconnection of remote control by selector switch (except for single-piece TL)
- Indication: mechanical on front face by toggle position.

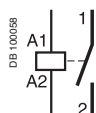
Technical data

Rating	32 A, $\cos \varphi = 0.6$
Voltage rating	TL: 1P 250 V, 50/60 Hz TL: 2P, 3P, 4P (TL+ETL): 415 V, 50/60 Hz
Inrush power	1P: 19 VA, 2P: 38 VA, 3P: 57 VA, 4P: 76 VA
Control voltage (Uc)	Tolerance at 50 Hz: $U_c +6\% -15\%$ Tolerance at 60 Hz: $U_c \pm 6\%$ Tolerance in DC: $+6\% -10\%$
Impulse duration	50 ms (recommended value for automation system: 200 ms)
Maximum switching frequency	5 switching operations/minute
Noise level on energisation	≤ 60 dBA (at 1 m)
Electrical durability	50,000 cycles (AC21), 20,000 cycles (AC22)
Operating temperature	-20°C to $+50^\circ\text{C}$
Tropicalisation	Treatment 2 (relative humidity 95 % at $+55^\circ\text{C}$)
Connection	Screw "±", Posidriv
Connection terminals	Power circuit: tunnel terminals for cables up to 10 mm ² Control circuit: tunnel terminals for 0.5 to 6 mm ² cables

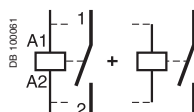
057310-30



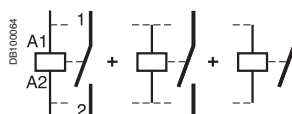
15515



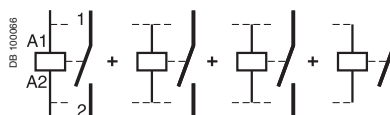
2P	2 + 2	230...240	110	15515 + 15505
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3P	2 + 4	230...240	110	15515 + 2 x 15505
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4P	2 + 6	230...240	110	15515 + 3 x 15505
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32 A ETL extensions

	2	230...240	110	15505
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Accessories

Set of 10 clips	15415
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057313



15515 + 2 x 15505

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TLc, TLm, TLs impulse relays with built-in auxiliary function

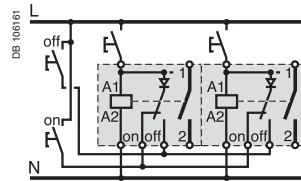


15518

TLc impulse relay with centralised control

- Mechanically latched opening and closing of circuits remotely controlled by impulse.
- Centralised control of a group TLc impulse relays while at the same time maintaining local impulse control.

Type	Width in mod. of 9 mm	Coil voltage U _c (V AC)	Cat. no.
TLc 16 A	2	230...240	15518
		48	15526
		24	15525



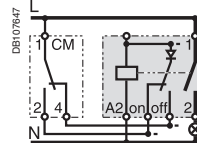
Technical data

Rating	16 A, cos φ = 0.6
Power circuit	1P: 250 V AC, 50/60 Hz, 3P: 415 V AC, 50/60 Hz
Inrush power	19 VA, 38 VA with ETL
Other data	Same as 16 A TL

TLm impulse relay with latched control

- Operates on latched orders coming from a changeover switch (selector switch, time switches, thermostat).
- The manual control is inoperative.

Type	Width in mod. of 9 mm	Coil voltage U _c (V AC)	Coil voltage U _c (V DC)	Cat. no.
TLm 16 A	2	230...240	110	15516



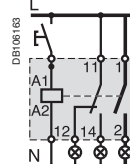
Technical data

Rating	16 A, cos φ = 0.6
Power circuit	1P: 250 V AC, 50/60 Hz, 3P: 415 V AC, 50/60 Hz
Inrush power	19 VA, 38 VA with ETL
Other data	Same as 16 A TL

TLs impulse relay for remote indication

- Mechanically latched opening and closing of circuits remotely controlled by impulses.
- Remote indication of the mechanical status of the impulse relay.

Type	Width in mod. of 9 mm	Coil voltage U _c (V AC)	Coil voltage U _c (V DC)	Cat. no.
TLs 16 A	2	230...240	110	15517
		48	24	15528
		24	12	15527



Technical data

Rating	16 A, cos φ = 0.6
Power circuit	1P: 250 V AC, 50/60 Hz, 3P: 415 V AC, 50/60 Hz
Inrush power	19 VA, 38 VA with ETL
Auxiliary circuit	24 V DC, V AC / 10 mA to 240 V DC, V AC / 6 A
Other data	Same as 16 A TL



15516



15517

Impulse relay auxiliaries

ATEt, ATLz, ATLC+s, ATLC, ATLS, ATLM, ATLC+c, ATL4

Add-on auxiliaries provide additional functions.

They allow:

- time delay control
- control by illuminated pushbuttons
- centralised control + indication
- multi-level centralised control
- step by step control.



15419



15413



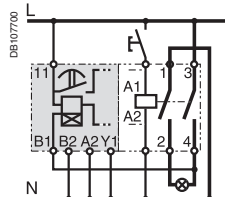
15409

ATEt time delay

Causes the automatic return of the impulse relay to the rest position after a time delay adjustable from 1 s to 10 h:

- the time delay cycle begins when the device closes
- a new impulse opens the impulse relay and interrupts the cycle.

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
ATEt	2	24...240	15419



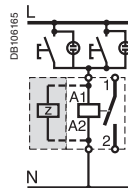
ATLz control by illuminated pushbuttons

Used to control impulse relays by illuminated pushbuttons, without operating risks:

- provide as ATLz when the current drawn up by the illuminated pushbuttons is higher than 3 mA (this current is sufficient to keep the coils energised). Above this value, fit one extra ATLz per 3 mA.

For example: for 7 mA, fit 2 ATLz.

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
ATLz	2	130...240	15413

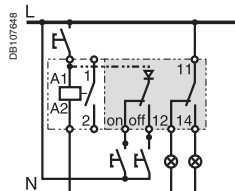


ATLC+s centralised control + indication

Used for centralised control, thanks to a "pilot line", of a group of impulse relays controlling separate networks, while at the same time maintaining local individual control of each impulse relay, and for remote indication of the mechanical status of each relay:

- auxiliary contact: 24 V DC, V AC / 10 mA a 240 V DC, VAC / 6 A.

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
ATLC+s	2	24...240	15409



Impulse relay auxiliaries

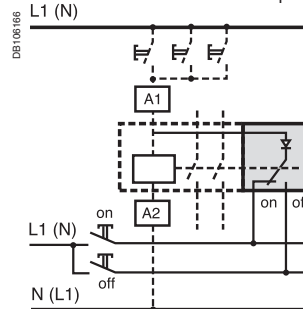
ATEt, ATLz, ATLC+s, ATLC, ATLS, ATLM, ATLC+c, ATL4 (cont.)



ATLC centralised control

Used for centralised control, thanks to a "pilot time", of a group of impulse relays controlling separate networks, while at the same time maintaining local individual control of each impulse relay.

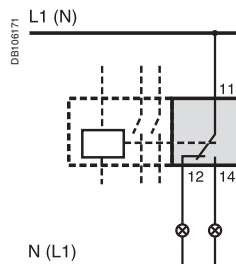
Type	Width in mod. of 9 mm	Coil voltage U_c (V AC)	Cat. no.
ATLC	1	24...240	15404



ATLS indication

Allows remote indication of the associated impulse relay.

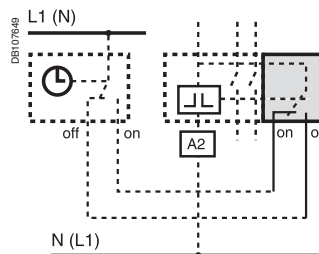
Type	Width in mod. of 9 mm	Voltage rating Current rating	Cat. no.
ATLS	1	24 V ...240 AC/DC 10 mA 6 A AC/DC	15405



ATLM latched control

Combined with an impulse relay, it operates on latched orders.

Type	Width in mod. of 9 mm	Voltage rating U_c (V AC) (V DC)	Cat. no.
ATLM	1	12...240 6...110	15414



Impulse relay auxiliaries

ATEt, ATLz, ATLC+s, ATLC, ATLS, ATLM, ATLC+c, ATL4 (cont.)



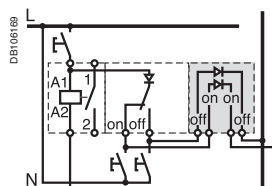
15410

ATLC+c multi-level centralised control

Used to control the centralised controls of a number of impulse relay groups, while at the same time maintaining local individual control and centralised control by level:

- each group, made up of TLc or (TL or TLI or TLI) + ATLC+s, must only contain a single ATLC+c
- mounting: without mechanical link with impulse relays and auxiliaries.

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
ATLC+c	2	24...240	15410

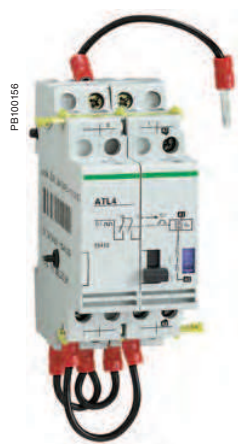
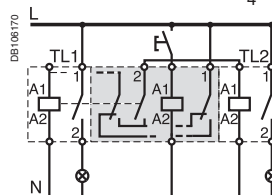


ATL4 step by step control

Allows the step by step sequence over 2 circuits:

- the cycle is as follows:
 - 1st impulse - TL 1 closed, TL 2 open
 - 2nd impulse - TL 1 open, TL 2 closed
 - 3rd impulse - TL 1 and 2 closed
 - 4th impulse - TL 1 and 2 open
 - 5th impulse - TL 1 closed, TL 2 open, etc.
- mounting: assembled between 2 impulse relays: according to the auxiliarisation table.

Type	Width in mod. of 9 mm	Coil voltage Uc (V AC)	Cat. no.
ATL4	4	230...240 110	15412



15412



15415

Accessories

Yellow clips

Ensure the mechanical link (indicated in dotted lines on the diagrams) and/or the electrical link between impulse relays.

Type	Cat. no.
Set of 10 clips (spare)	15415

functions

These devices are used to relay ON and OFF information to the auxiliary circuits and to control low power loads.

description

common technical data

- power circuit:
 - rating (In): 10 A, $\cos \varphi = 1$
 - voltage (Ue): 230 V AC
 - voltage (Ui): 250 V AC
- control circuit:
 - voltage (+/- 10%): 12, 24, 48, or 230 V AC
 - frequency: 50 ... 60 Hz
 - inrush and holding power:
 - RLI: 4 VA
 - RLI + ERL: 8 VA
- electrical durability: 100,000 AC21 operating cycles ($\cos \varphi = 1$)
- connection: tunnel terminals for 0.5 to 6 mm² cables
- compliance with standards IEC 255 and NF C 45-250
- direct control on the front face:
 - power: by pushbutton
 - coil: by selector switch (disconnection)
- position indicator: built into the pushbutton
- identification: clip-on markers on the front face

specific technical data

RLI

- the RLI relay contains:
 - 1 changeover switch (O-C)
 - 1 normally open switch (NO)

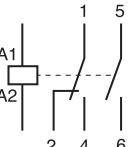
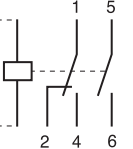
ERL

- the ERL extension (3 ERL maximum for 1 RLI) contains:
 - 1 changeover switch (O-C)
 - 1 normally open switch (NO)
- it is mounted without tools or additional wiring by means of a yellow clip
- this clip is used for mechanical assembly and electrical connection between coils

catalogue numbers



15535, 15539

type	rating (A)	coil voltage Ue (V AC)	catalogue number	width in mod. of 9 mm
RLI relay				
	10	230...240	15535	2
		48	15536	2
		24	15537	2
		12	15538	2
ERL extension				
	10	230...240	15539	2
		48	15540	2
		24	15541	2
		12	15542	2

additional information

dimensions: page D93

CT contactors overview

Contactors can be used to control:

■ heating, ventilation, roller blinds, sanitary hot water, mechanical ventilation systems, etc.

■ load-shedding of non-priority circuits.

Manually-operated contactors let you override the (ON/OFF) control of the load. CT contactors can accommodate the following auxiliaries on their sides:

■ indication

■ interference filtering

■ dual control (impulse and/or latched)

■ time delay.

CT+ contactors benefit from high performance characteristics for demanding applications.

Contactor overview

Function

Contactors are designed to control 1P, 2P, 3P and 4P circuits up to 100 A. Each model is available in two versions:

■ standard contactors:

□ normally open for heating, ventilation, roller blinds and mechanical ventilation systems

□ normally closed for load-shedding of non-priority circuits

■ manually-operated contactors letting you override the (ON/OFF) control of the load.

■	NO
▲	NC
★	NO + NC

Choice of 50 Hz contactors

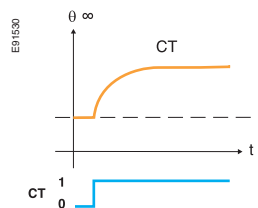
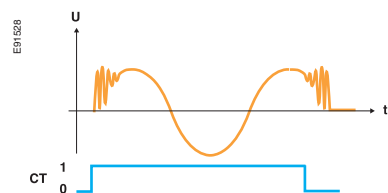
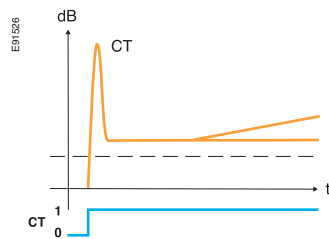
		High performance contactors	
		Standard CT+	Manually-operated CT+
Rating	A	20	20
Control voltage	V AC	230	230
Number of poles			
	1P	-	-
	2P	■	■
	3P	-	-
	4P	-	-
Maximum number of switching operations a day		5,000	5,000
Lifetime (total number of switching operations)		5,000,000	5,000,000
Load type		All types without derating	All types without derating
Installation		All positions	All positions
Noise	Noise	dB CT+ Audible perception threshold CT+ 1 CT+ 0	
Electromagnetic disturbances		U CT+ 1 CT+ 0	
Temperature rise		θ ∞ CT+ Ambient temperature CT+ 1 CT+ 0	
Auxiliaries			
Auxiliary contacts	ACTo+f	No	No
Interference filter	ACTp	No	No
Mixed control: impulse/latched	ACTc	No	No
Time delay	ATEt	No	No

Choice of 60 Hz contactors

		Contactors that can be equipped with auxiliaries						Manually-operated contactors	
		Standard contactor							
Rating	A	16	25	40	63			40	
Control voltage	V AC	127 220/240	127 220/240	127 220/240	127 220/240			127 230/240	
Number of poles	1P	-	-	-	-	-	-	-	-
	2P	★ ★	■ ▲ ■ ▲	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
	3P	-	-	■ ■	■ ■	■ ■	■ ■	-	-
	4P	-	-	-	-	-	-	-	-
Auxiliaries									
Auxiliaries contacts	ACTo+f	Yes						Yes	
Interference filter	ACTp	Yes						Yes	
Mixed control: impulse/latched	ACTc	Yes						Yes	
Time delay	ATEt	Yes						Yes	

Contactors that can be equipped with auxiliaries

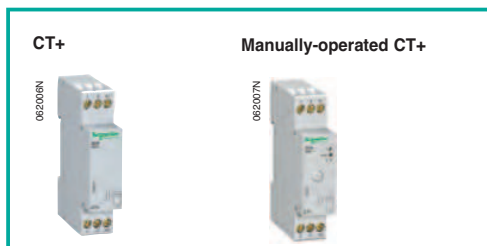
Standard contactor												Manually-operated contactors							
16	24	220	220/240	230/240	25	220	220/240	230/240	40	63	100	16	25	220	220/240	230/240	40	63	220/240
12	24	220	220/240	230/240	24	220	220/240	230/240	220/240	24	220/240	220	230/240	24	220	220/240	230/240	24	220/240
■	■	■	-	■	-	■	-	■	-	-	-	-	-	-	-	-	-	-	-
■ ★	■ ★	■ ★	■ ★	■ ★	■	■ ▲	-	■ ▲	■	■	■	■ ★	■ ★	■ ▲	■	-	■	■	■
-	-	-	▲	-	-	-	■	-	■	-	■	-	-	■	-	■	-	-	-
-	-	-	▲ ★	-	■ ▲	-	■ ▲ ★	-	■ ▲	■ ▲	■ ▲ ★	-	-	■ ▲	-	■	■ ▲	■	■
100												100							
200,000												200,000							
All types as per derating table												All types as per derating table							
Vertical ± 30° max.												Vertical ± 30° max.							



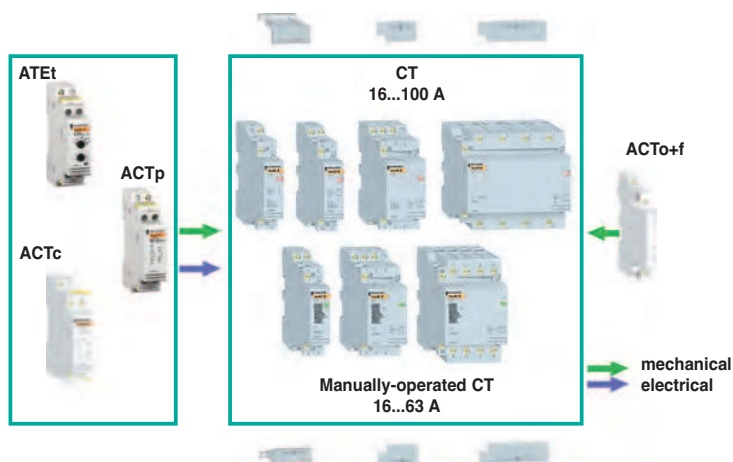
Yes	Yes
Yes	Yes
Yes	Yes
Yes	Yes

CT contactors overview

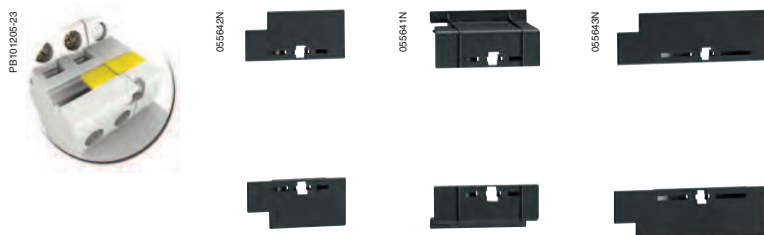
Contactor auxiliarisation principle



DE100216



Accessories



Yellow clips

Sealable screw shields

Yellow clips

Ensure the mechanical and/or electrical link between contactors and their auxiliaries.

Sealable screw shields

Used to avoid all contact with device terminals (upstream and downstream).

CT+ high performance contactors allow remote control of single-phase circuits. They are intended for demanding applications.

CT+ high performance contactors combine the advantages of static switching and electromechanical technology: compact dimensions, minimum temperature rise. CT+ contactors provide a solution when high performance is required, particularly in terms of number of switching operations, lifetime, versatility with loads, minimum noise, absence of electromagnetic disturbances, installation in all positions and limited temperature rise.



15030

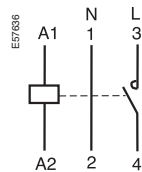


15031

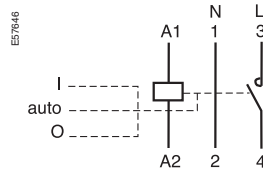


spacer

Type	Contact	Rating (A)	Control voltage (V AC)	Width in mod. of 9 mm	Cat. no.
CT+					
1P+N standard	1NO	20	230	2+1 ⁽¹⁾	15030



1P+N with manual operation	1NO	20	230	2+1 ⁽¹⁾	15031
-----------------------------------	-----	----	-----	--------------------	--------------



(1) comes with a 9 mm spacer (cat. no. **27062**): to be used in case of mounting of the CT+ next to a circuit-breaker, contactor, impulse relay, etc. to guarantee optimum use.

Operation

CT+ high performance contactors have a NO contact and are controlled by latched type electrical orders. An orange indicator light comes ON on the front face when the output contact is closed.

The manually-operated CT+ contactors are equipped on their front face with an operating mode selection pushbutton. A green indicator light indicates the current mode:

- automatic operating mode (green light ON)
- temporary "ON" override (green light flashing)
- permanent shutdown mode (light OFF).

In ON override or permanent shutdown mode, the CT+ systematically returns to automatic operating mode further to a supply outage.

Δ It is compulsory to use the same phase for power and control connection.

Technical data

Voltage rating	Control circuit: 230 V AC (±10 %) ; 50 Hz Power circuit: 230 V AC (±10 %) 50 Hz
Inrush power	11 VA
Holding power	1.1 VA
Maximum switching frequency	6 switching operations/minute
Characterisation on load types	No derating
Electrical durability	5,000,000 cycles
Compliance with standard	EN 60947-2-1
Approval	NF USE
Operating temperature	-5°C to +55°C with use of a spacer
Connection by tunnel terminals for flexible and rigid cables	Up to 2 x 1.5 mm ² with end 2 x 4 mm ² without end 1 x 4 mm ² without end

The breadth of the CT contactor range satisfies most application cases (multi-pole, pole composition, etc.).

CT contactors can be combined with auxiliary control, protection and indication functions.



Permanent ON override

Operation

CT contactors equipped with one or more normally open (NO) or normally closed (NC) contacts are controlled by latched type electrical orders. On the front face a red indicator light indicates voltage presence at the coil terminals (A1-A2). Manually-operated contactors have a 4-position selector switch on their front face:

- automatic operating mode
- temporary "ON" override
- permanent "ON" override: used to lock the contactor in the ON position during installation maintenance.
- shutdown.

Technical data

Power circuit

CT ratings	16 to 100 A (category AC7a)
Manually-operated CT ratings	16 to 63 A (category AC7a)
Characterisation on load types	Consult complementary technical information - Part F
Voltage rating	250 V AC (1P and 2P), 400 V AC (3P and 4P)
Frequency	50 Hz

Control circuit

Voltage	12 V AC ($\pm 10\%$), 24 V AC ($\pm 10\%$), 127 V AC ($\pm 10\%$), 220 V AC (-10% $+5\%$), 230...240 V AC (-10% $+6\%$)
Coil frequency	50 Hz

Inrush and holding power

Type	Rating (A)	Consumption inrush (VA)	holding (VA)	Max. power (w)
1P, 2P	16/25	15	3.8	1.1
3P, 4P	16/25	34	4.6	1.6
2P	40/63	34	4.6	1.6
3P, 4P	40/63	53	6.5	2.1
2P	100	53	6.5	2.1
4P	100	106	13	4.2

- Operating temperature: -5°C to $+60^{\circ}\text{C}$.
- Tropicalisation: treatment 2 (relative humidity: 95 % at 55°C).
- Compliance with standards: EN 60947-4-1, EN 61095, IEC 1095.
- Approvals: NF, IMQ, VDE, GOST, CCC, CEBEC.
- ELSV compliance (Extra Low Safety Voltage): for 25 A 2P versions with 24 V AC control.

Connection by tunnel terminals

Cable type	Control circuit	Power circuit 16 and 25 A	40-63 A	100 A
Flexible	2 x 2.5 mm ²	2 x 2.5 mm ²	2 x 10 mm ²	2 x 35 mm ²
Rigid	2 x 1.5 mm ²	6 mm ²	25 mm ²	50 mm ²

- Marking: contactors can be equipped with clip-on markers.

Accessories

Screw shields

- Designed to cover terminals to avoid contact with device screws.
- Allow sealing.

Spacer

- Required to reduce temperature rise of modular devices installed side by side.
- Recommended to separate electronic devices (thermostat, programmable clock, etc.) from electromechanical devices (relays, contactors).

Derating of contactors mounted in modular enclosure if inside temperature is $> 40^{\circ}\text{C}$

Contactor rating	40°C	50°C	60°C
16 A	16 A	14 A	13 A
25 A	25 A	22 A	20 A
40 A	40 A	36 A	32 A
63 A	63 A	57 A	50 A
100 A	100 A	87 A	80 A

(1) Spacer compulsory between each product.



2 CT + spacer + 2 CT



CT + spacer + IHP



16113



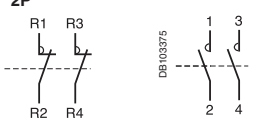
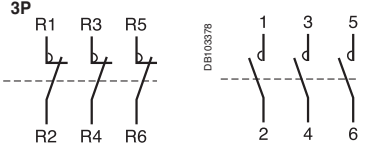
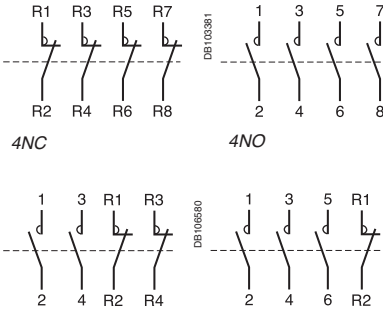
15966



16124



15978

Type	Contact	Rating Voltage	Width in Cat. no.
50 Hz contactors			
1P  1NO	1NO 16 12 2	16110	
	1NO 16 24 2	16111	
	1NO 16 220 2	18006	
	1NO 16 230...240 2	16113	
	1NO 25 220 2	18011	
	1NO 25 230...240 2	15958	
2P  2NC 2NO 1NO + 1NC	2NO 16 12 2	16114	
	2NO 16 24 2	16115	
	2NO 16 220 2	18007	
	2NO 16 230...240 2	15957	
	1NO+1NC 16 12 2	16125	
	1NO+1NC 16 24 2	16126	
	1NO+1NC 16 220 2	18008	
	1NO+1NC 16 230...240 2	15956	
	2NO 25 24 2	16020	
	2NO 25 220 2	18012	
	2NO 25 230...240 2	15959	
	2NC 25 220 2	18013	
	2NC 25 230...240 2	15960	
	2NO 40 220...240 4	15966	
3P  3NC 3NO	3NC 16 220...240 4	16120	
	3NO 25 220...240 4	15961	
	3NO 40 220...240 6	15967	
	3NO 63 220...240 6	15972	
	4P  4NC 4NO 2NO + 2NC 3NO + 1NC	4NC 16 220...240 4	16124
		2NO+2NC 16 220...240 4	16130
4NO 25 24 4		16022	
4NO 25 220...240 4		15962	
4NC 25 24 4		16023	
4NC 25 220...240 4		15963	
2NO+2NC 25 220...240 4		15964	
4NO 40 220...240 4		15968	
4NC 40 220...240 4		15969	
4NO 63 24 6		16025	
4NO 63 220...240 6		15973	
4NC 63 24 6		16026	
4NC 63 220...240 6		15974	
2NO+2NC 63 220...240 6		15975	
3NO+1NC 63 220...240 6	15976		
4NO 100 220...240 12	15978		

Auxiliarisation: ACTo+f, ACTp, ACTc, ATet.

CT contactors - 50 Hz



15981



15988



15921



15922



15923

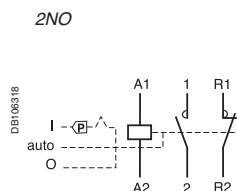


27062

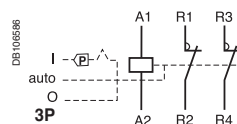
Type	Contact	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
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50 Hz manually-operated contactors

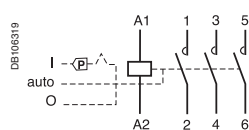
	2P	2NO	16	220	2	18015
		2NO	16	230...240	2	16116
		1NO+1NC	16	220	2	18016
		1NO+1NC	16	230...240	2	16127
		2NO	25	220	2	18018
		2NO	25	230...240	2	15981
		2NO	40	220...240	4	15984
		2NO	63	220...240	4	15987



1NO+1NC

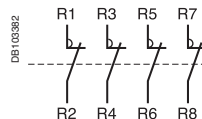


2NC

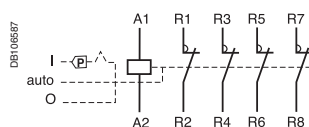


3NO

	4P	4NO	25	220...240	4	15983
		4NO	40	220...240	6	15986
		4NO	63	220...240	6	15988



4NO



4NC

Type	Rating (A)	Width in mod. of 9 mm	Cat. no.
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CT accessories

Screw shields (bag of 10 upstream/downstream)	3P, 4P	25	4	15921
	2P	40/63	4	15922
	3P	40/63	6	15923
Spacer			1	27062

Auxiliarisation: ACTo+f, ACTp, ACTc, ATet.

Various auxiliaries can be fixed to the sides of CT contactors to provide:

- indication
- interference filtering
- impulse/latched control
- time delay

CT+ contactors can not accommodate these auxiliaries.

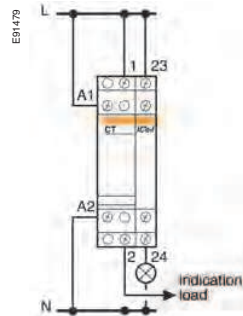


15914

ACTo+f

This auxiliary allows indication or control of the "open" or "closed" position of the contactor power contacts.

Type	Width in mod. of 9 mm	Cat. no.
ACTo+f	1	15914



- Voltage: 24...240 V AC/DC - 50/60 Hz.
- Contact: 1 NO + 1 NC:
- Minimum 10 mA at 24 V DC/AC - $\cos \varphi = 1$
- Maximum 2 A at 240 V DC/AC - $\cos \varphi = 1$.

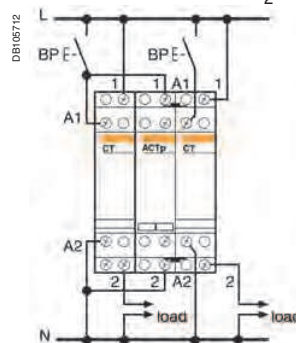
Technical data

Combination with CT	Right side
Connection	Tunnel terminals Flexible cable: 2 x 2.5 mm ² Rigid cable: 2 x 1.5 mm ²

ACTp

This auxiliary is an interference suppressor which limits overvoltages on the control circuit.

Type	Width in mod. of 9 mm	Control voltage (V AC)	Cat. no.
ACTp	2	24	15919
		110...240	15920



The ACTp has 2 separate and identical circuits, allowing it to be combined with 2 different CT contactors:

- one by clips, on the CT mounted to its right
- the other by wires.

Technical data

Power supply	Voltage: 24 V, 230 V Frequency: 50/60 Hz
Combination with CT	Left side By clips ⁽¹⁾
Consumption	Off-load: 3 VA
Connection	Tunnel terminals Flexible cable: 2 x 2.5 mm ² Rigid cable: 2 x 1.5 mm ²

(1) electrical and mechanical link.



15920

CT contactor auxiliaries

ACTo+f, ACTp, ACTc, ATEt



18308

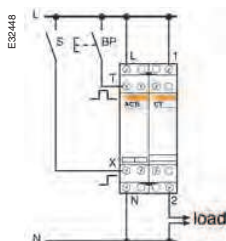
ACTc

This auxiliary, combined with contactors, enables them to be controlled by 2 order types:

- impulse order for local control (input T)
- latched order for centralised control (input X).

The last order received takes priority.

Type	Width in mod. of 9 mm	Control voltage (V AC)	Cat. no.
ACTc	2	230...240	18308
		24...48	18309



- Minimum impulse duration: 250 ms.
- mains power outages:
 - < 1 s: keeps its initial status
 - ≥ 5 s: reset
 - put back into operation by manual operation on X or T.

Technical data

Power supply	Voltage: 24...48 V, 230 V Frequency: 50/60 Hz
Combination with CT	Left side by clips ⁽¹⁾
Consumption	Off-load: 3 VA Inrush ⁽²⁾ : 2 A Holding ⁽²⁾ : 0.5 A
Connection	Tunnel terminals Flexible cable: 2 x 2.5 mm ² Rigid cable: 2 x 1.5 mm ²

(1) Electrical and mechanical link.

(2) Maximum consumption of all contactors controlled.

ATEt

This auxiliary is used to time delay contactor control. According to cabling, there are 4 possible time delay types.

Type	Width in mod. of 9 mm	Control voltage (V AC)	Cat. no.
ATEt	2	24...240	15419

Characteristics

Power supply	Voltage: 24...240 V Frequency: 50/60 Hz
Combination with CT	Left side By clips ⁽¹⁾
Consumption	Off-load: 5 VA Inrush ⁽²⁾ : 3 A Holding ⁽²⁾ : 0.2 A
Connection	Tunnel terminals Flexible cable: 2 x 2.5 mm ² Rigid cable: 2 x 1.5 mm ²

(1) Electrical and mechanical link.

(2) Maximum consumption of all contactors controlled.



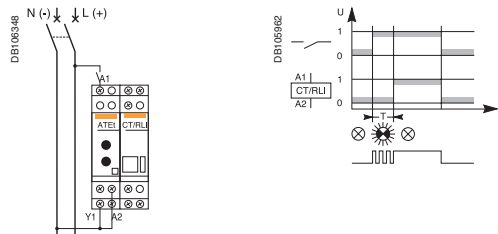
15419

Operation

- There are 4 types of time delay:
 - the A type time delay is used to delay energisation of a load
 - the B type time delay is used, on closing of the control contact (pushbutton), to energise a load for a given time
 - the C type time delay is used to extend energisation of a load
 - the H type time delay is used, as long as the control contact remains closed, to energise a load for a given time.
- Time delay range: 1 s to 10 h.
- Repetition accuracy: $\pm 0,5 \%$.

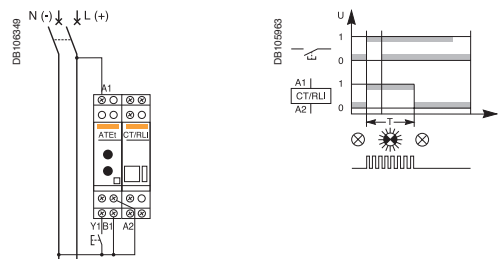
A type:

Delays energisation of the contactor or relay.



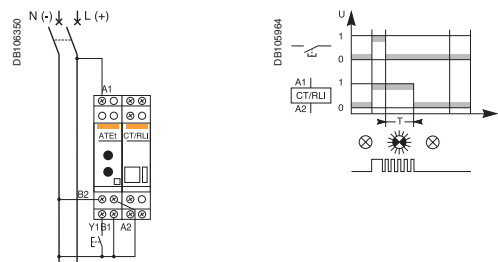
B Type:

Energises the contactor or relay on closing of a pushbutton. The time delay starts on closing of the control order.



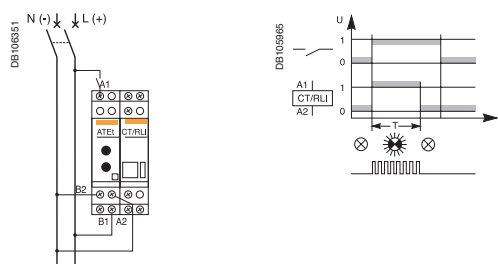
C Type:

Energises the contactor or relay on closing of a pushbutton. The time delay starts on release of the control order.



H Type:

Controls the contactor or relay for a given time on energisation.



Timers MIN 3-3 and MIN 3-4



MIN 3-3



MIN 3-4

Function

- Timers are used to close and open a contact after 3 minutes.
- They are fitted with a 2-position selector switch on the front panel:
 - automatic operation: each time a pushbutton is pressed, lighting restarts for 3 minutes
 - ON override: permanent lighting.

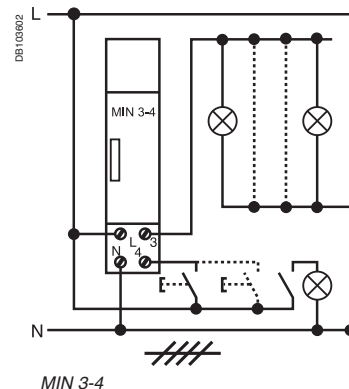
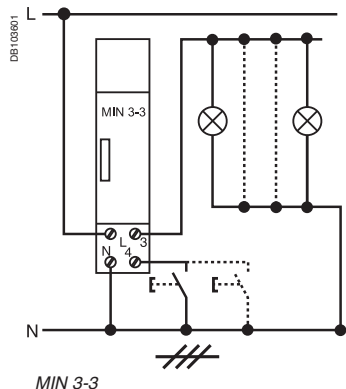
Technical data

- Voltage rating: 230 V.
- Frequency: 50 Hz.
- Consumption less than 5 VA.
- Power circuit:
 - output contact rating: 10 A - 230 V ~, Cos ϕ = 1.
 - maximum power controlled:
 - 230 V LV halogen or incandescent lighting: 1500 W
 - series corrected or non-corrected fluorescent lighting: 2000 VA
 - parallel-corrected fluorescent lighting (70 ?F): 1000 VA.
- Degree of protection: IP 20 as per EN 60529.
- Connection:
 - by tunnel terminals, for cables up to 6 mm²
 - connection type:
 - MIN 3-3: 3 wires (PB connected to neutral)
 - MIN 3-4: 4 wires (PB connected to phase).
- Operating temperature: -10°C to +40°C.
- Weight (g): 70.

Catalogue numbers

Type	Width in mod. of 9 mm	Cat. no.
MIN 3-3	2	15360
MIN 3-4	2	15361

Connection



Functions

MIN, MINs

These timers allow closing and then opening of a contact in a determined time.

MINp, MINT

This timer allows closing and then opening of a contact in a determined time, and it also provides warning that the lighting is about to be switched off by flickering of the lamplight. (switch-off warning). The MINT timer is the same as MINp with an "impulse relay" additional function (see "MINT" technical data).

PRE

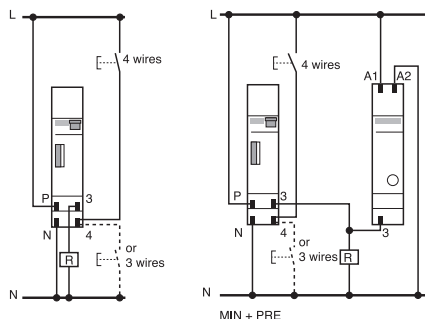
This is used in association with MIN or MINs timers and only on incandescent lighting circuits (not used on fluorescent, fluocompact lamps and very low voltage halogen lamps). It provides warning that the lighting is about to be switched off by reducing the brightness by 50% during the 20 to 60 s warning time.

	MIN	MINs	MINp	MINT	PRE
Catalogue numbers	15363	CCT15232	CCT15233	CCT15234	15376
Technical data					
Voltage (+10 %, -15%)	230 V AC	230 V AC	230 V AC	230 V AC	230 V AC
Frequency	50 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Adjustable time delay	1 to 7 min.	0.5 to 20 min.	0.5 to 20 min.	0.5 to 20 min.	20 to 60 s
Long time delay			1 h	1 h	
Consumption	1 VA	< 6 VA	< 6 VA	< 6 VA	
Switching capacity (cos φ = 1)	16 A	16 A	16 A	16 A	
Operating temperature	-10 to +50 °C	-25 to +50 °C	-25 to +55 °C	-25 to +55 °C	-10 to +50 °C
Width (9 mm modules)	2	2	2	2	2
1 screw connection per pole for cables up to 6 mm ²	■	■	■	■	■
Selection of the type of connection (3 or 4 wires)	Selector switch	Automatic	Automatic	Automatic	
Mechanical compatibility with electrical distribution comb busbar		■	■	■	
Switch-off warning function			■	■	■
Impulse relay function				■	

MIN, MINs, MINp and MINT timers, Technical data - MIN, MINs



MIN



MIN Functions

These timers allow closing and then opening of a contact in a determined time.

Technical data

- Two operating modes triggered by switch on front face:
 - automatic mode:
 - operation in timing mode,
 - time delay adjustable from 1 to 7 min.,
 - setting in steps of 15 s using knob,
 - pressing a push-button renews the time delay.
 - manual override mode: constant lighting.
- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50 Hz.
- Consumption during operation: 1 VA maxi.
- Consumption of connected luminous push-buttons: 50 mA maxi.
- Degree of protection: IP 20B.
- Operating temperature: -10°C to $+50^{\circ}\text{C}$.
- Contact rating: 16 A, $\cos \varphi = 1$.
- Control circuit: connected luminous push-buttons; timer inoperative via self-protection if consumption above 50 mA maximum.
- Switch-off warning: external via use of PRE product.

Connection

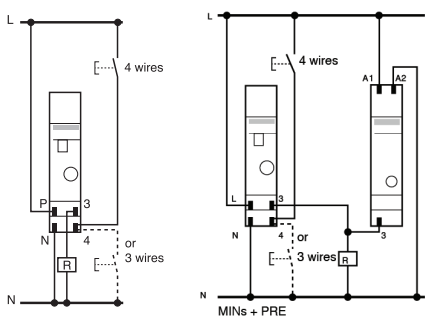
- Connection terminals: 1 screw connection per pole for cables up to 6 mm².
- Connection type: 3 or 4 wires with selector switch on the side of the product.

Catalogue numbers

Type	Cat. no.
MIN	15363



MINs



MINs Functions

These timers allow closing and then opening of a contact in a determined time.

Technical data

- Two operating modes triggered by switch on front face:
 - Timer mode: time delay adjustable from 0.5 to 20 min.
 - Permanent mode: constant lighting.
- pressing on a push-button renews the time delay.
- Voltage: 230 V AC $+10\%$, -15%
- Frequency: 50/60 Hz.
- Consumption during operation: <6 VA
- Consumption of connected luminous push-buttons: 50 mA maxi.
- Insulation class: class II.
- Degree of protection: IP 20B.
- Operating temperature: -25°C to $+50^{\circ}\text{C}$.
- Contact rating: 16 A, $\cos \varphi = 1$.
- Switch-off warning: external via use of PRE product.

Connection

- Connection terminals: 1 screw connection per pole for cables up to 6 mm².
- Connection type: 3 or 4 wires with automatic selection of the control push-button connection.
- Mechanical compatibility with electrical distribution comb busbars.

Catalogue numbers

Type	Cat. no.
MINs	CCT15232

P93364



MINp

P93365



MINT

MINp, MINT Functions

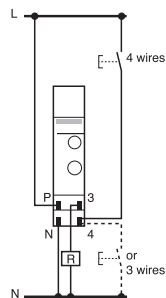
This timer allows closing and then opening of a contact in a determined time, and it also provides warning that the lighting is about to be switched off by flickering of the lamplight. (switch-off warning). The MINT timer is the same as MINp with an "impulse relay" additional function (see "MINT").

Technical data

- Time delay adjustable from 0.5 to 20 min.
- Three operating modes triggered by switch on front face:
 - timer mode with warning function built into the device. The lamp blinks 40 and 30s before the end of the time delay,
 - timer mode without "switch-off warning" function,
 - permanent mode : constant lighting.
- Timer mode operation:
 - pressing a push-button for longer than 2 s: lighting will last for 1h. Pressing again a push-button for less than 2 s relaunch the time delay of 1h and pressing again a push-button for more than 2 s switches off the light.
 - for MINp, pressing a push-button for less than 2 s launch the pre-set time delay, pressing again a push-button for less than 2 s relaunch the pre-set time delay,
 - for MINT, pressing a push-button for less than 2 s launch the pre-set time delay, pressing again a push-button for less than 2 s, switches off the light (impulse relay mode).
- Voltage: 230 V AC +10 %, - 15%.
- Frequency: 50/60 Hz.
- Consumption during operation: < 6 VA.
- Consumption of connected luminous push-buttons: 150 mA maxi.
- Insulation class: class II.
- Degree of protection: IP 20B.
- Operating temperature: -25°C to +50°C.
- Contact rating: 16 A, cos φ = 1.

Connection

- Connection terminals: 1 screw connection per pole for cables up to 6 mm².
- Connection type: 3 or 4 wires with automatic selection of the control push-button connection.
- Mechanical compatibility with electrical distribution comb busbars.



Catalogue numbers

Type	Cat. no.
MINp	CCT15233
MINT	CCT15234

MIN, MINs, MINp and MINt timers,

Technical data - PRE switch-off warning



PRE

PRE switch-off warning Functions

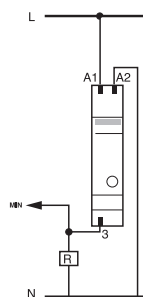
This is used in association with MIN or MINs timers and only on incandescent lighting circuits (not used on fluorescent, fluocompact lamps and very low voltage halogen lamps). It provides warning that the lighting is about to be switched off by reducing the brightness by 50% during the 20 to 60 s warning time.

Technical data

- Only to be used with the MIN et MINs timers.
- 50% reduction in brightness during warning time.
- Time adjustable from 20 to 60 s.
- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50/60 Hz.
- Operating temperature: -10°C to $+50^{\circ}\text{C}$.
- Maximum power: 2300 W for incandescent lamps only.
- Not compatible with fluorescent lamps, fluocompact lamps and very low voltage halogen lamps.

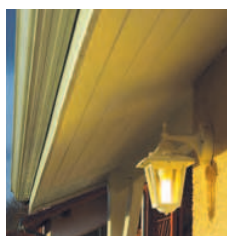
Connection

- Connection terminals: 1 screw connection per pole for cables up to 6 mm².
- Connection type: 3 or 4 wires.



Catalogue numbers

Type	Cat. no.
PRE	15376
Specific terminal shield for MIN	15359



Residential lighting management



Bell management in schools

Time switches are used to accurately and automatically program the operation of heating, lighting, ventilation, access control, bells, roller blinds, etc.

Energy savings

The installation only operates when necessary, and during low-rate periods.

Convenient use

Customization of operating periods, accurate start-up.

Increased security

Simulation of presence with the random operating mode proposed in IHP'+ versions.



Heating and ventilation management in buildings



Access management in buildings

The intuitive switches

With 4 keys and a display, they operate on a weekly cycle: the same program is repeated week after week.

The multifunctional switches

They operate with weekly or annual time programming distributed across 1, 2, 3 or 4 channels, 6 inputs to condition the functions.

The mechanical switches

They operate on an hourly, daily or weekly cycle: the same program is repeated hour after hour (IH 60mn), day after day (IH 24h) or week after week (IH 7j).



Advanced features of 45 mm intuitive switches

Time-savings with intuitive programming

- Only 4 keys.
- Choice of language and guiding in the menus by key words to create, check, modify or partially or totally delete the program.
- Time updating and changeover to winter/summer time:
 - automatic: selected when programming the changeover date (according to geographic area),
 - manually by the user,
 - without modification of programs.

Unique programming legibility

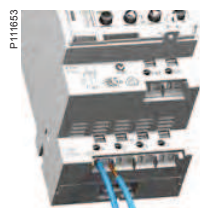
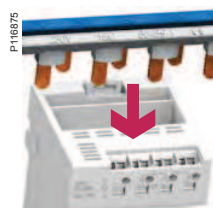
- Large screen for display of:
- Hour, minutes and day of the week
 - Current operating mode
 - Channel switching status ("On", "Off")
 - Control mode (automatic, override, permanent, holiday or random for the + version)
 - Operation on mains or battery

Simplified installation

- Mechanical compatibility with electrical distribution busbar
- Direct connection of loads up to 16 A under 250 V
- Fast connection; 2 screw-less terminals per pole for cables up to 2.5 mm²
- Installation leaflet always available in the device thanks to the built-in leaflet holder slot
- Swivel, sealable cover.

Simplified use

- Backlit display.
- Saving and duplicating of programs with memory key.
- Programming with a programming kit for PC.
- Control of the time switch away from the panelboard via external inputs.



Programming kit for PC



Memory key

Choice table

The time switches control opening and closing of one or more separate circuits according to a programming pre-set by the user:

- by memorisation of On and Off switching operations for the IHP switches
- by positioning of jumpers or captive segments on a programming dial for the mechanical IH switches.

An IHP or IH time switch is chosen according to the following criteria:

Designation	Number of channels	Cycle period (d: day)	Minimum time between 2 switching operations	Number of switching operations	Saving on mains cut off	Width (modules of 9 mm)	Override controls On / Off	Output contact changeover switch (cos φ = 1)	Time changeover (summer/ winter)
The intuitive switches									
IHP 1c	1	24 h and/or 7 d	1 min.	56	6 years	5	On / Off	16 A	Auto
IHP + 1c	1	24 h and/or 7 d	1 s	84	6 years	5	On / Off	16 A	Auto
IHP 2c	2	24 h and/or 7 d	1 min.	56	6 years	5	On / Off	16 A	Auto
IHP + 2c	2	24 h and/or 7 d	1 s	84	6 years	5	On / Off	16 A	Auto
IHP DCF 1c ⁽¹⁾	1	24 h and/or 7 d	1 s	42	4 years	5	On / Off	16 A	Auto
IHP 1c (UL) ⁽²⁾	1	24 h and/or 7 d	1 min.	28	3 years	5	On / Off	16 A	Auto
The 18 mm intuitive switches									
IHP 1c 18 mm	1	24 h and/or 7 d	1 min.	28	3 years	2	On / Off	16 A	Auto
IHP + 1c 18 mm	1	24 h and/or 7 d	1 min.	42	3 years	2	On / Off	16 A	Auto
The multifunctional switch									
ITM 4C-6E ⁽³⁾	4	60 min., 24 h, 7 d, 7 d + dated d	1 s	⁽⁴⁾	5 years	10	On/Off ⁽⁶⁾	10 A	Auto
The mechanical switches									
IH 60mn 1c SRM	1	60 min.	37.5 s	48 On - 48 Off	none	6	On	10 A	Manual
IH 24h 1c SRM	1	24 h	15 min.	48 On - 48 Off	none	6	On	16 A	Manual
IH 24h 1c ARM	1	24 h	15 min.	48 On - 48 Off	200 h ⁽⁵⁾	6	On	16 A	Manual
IH 24h 2c ARM	2	24 h	30 min.	24 On - 24 Off	150 h	6	On	16 A	Manual
IH 7j 1c ARM	1	7 days	2 h	42 On - 42 Off	200 h ⁽⁵⁾	6	On	16 A	Manual
IH 24h + 7j 1+1c ARM	1+1	24 h + 7 days	45 min. + 12 h	16 On - 16 Off + 7 On - 7 Off	150 h	6	On	16 A	Manual
The 18 mm mechanical switches									
IHH 7j 1c ARM	1	7 days	2 h	42 On - 42 Off	100 h	2	On / Off	16 A	Manual
IH 24h 1c ARM	1	24 h	15 min.	48 On - 48 Off	100 h	2	On / Off	16 A	Manual
IH 24h 1c SRM	1	24 h	15 min.	48 On - 48 Off	none	2	On / Off	16 A	Manual
Accessories									
Programming kit ⁽⁷⁾									
Memory key ⁽⁷⁾									
Memory cartridge ⁽⁸⁾									
ANT DCF antenna									

⁽¹⁾ The IHP DCF is synchronised on the Frankfort transmitter via the ANT DCF antenna.

⁽²⁾ Supply voltage: 120 V CA.

⁽³⁾ 4 output channels and 6 condition inputs.

⁽⁴⁾ 45 time brackets in weekly time programming, 15 time brackets in annual time programming, 20 different pulses in pulse programming.

⁽⁵⁾ 100 h for 100 V CA supply voltage.

⁽⁶⁾ On/Off via an override input or a condition input.

⁽⁷⁾ For IHP + 1c and IHP + 2c.

⁽⁸⁾ For ITM 4c-6E.



	Back-lit display, random function and pulse programming ⁽⁹⁾	"Absence for holidays" function	Screwless connection	Mechanical compatibility with electrical distribution comb busbars	Input for external control	Instruction manual holder on front face	Memory key integrated in front face	Cat. no.
		■	■	■		■		CCT15720 ⁽¹⁰⁾
	■	■	■	■	1 input	■	■	CCT15721 ⁽¹⁰⁾
		■	■	■		■		CCT15722 ⁽¹⁰⁾
	■	■	■	■	2 inputs	■	■	CCT15723 ⁽¹⁰⁾
	Random function	■				■		15857
						■		15830
								15724 ⁽¹⁰⁾
	■	■		■				15725 ⁽¹⁰⁾
	Pulse function		■			■	■	15270
			■					CCT15338
			■					CCT16364
			■					CCT15365
								15337
			■					CCT15367
								15366
								15331
								15336
								15335
								CCT15860
								CCT15861
								15280
								15858

⁽⁹⁾ Pulse programming allows switching operations of a duration less than one minute (adjustable from 1 to 59 s); a pulse control always has priority.

⁽¹⁰⁾ French, English, Italian, Spanish, German, Portuguese languages.



IHP 1c.



IHP 2c.



IHP +1c.



IHP +2c.



Programming kit for PC.



Memory key.

Function

- These time switches automatically switch on and off loads according to the program entered by the user.
- They operate on weekly cycle: the same program is repeated week after week.
- They offer automatic summer/winter time change, and allow to adjust it according to where you are located.
- The program can be overridden temporary or permanently by pressing 2 keys on the product.
- The IHP 1C and 2C, as the IHP+ also offer holidays program, by configuring the starting and ending dates of the absence.

Electrical data

- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50/60 Hz.
- Consumption: 2 VA for IHP DCF 1c, 4 VA for IHP 1c/+1c, 7 VA for IHP 2c/+2c and 6 VA for IHP 1c (UL).
- Saving of program and time by lithium battery:
 - lifetime: 6 years for IHP 1c/2c, IHP+ 1c/2c, 12 years for IHP DCF 1c, IHP 1c (UL),
 - back-up time, cumulated mains cut off: 4 years for IHP DCF 1c, 5 years for IHP 1c (UL), 6 years for IHP 1c/2c and IHP+ 1c/2c.
- Time accuracy:
 - ± 1 s per day at 20 °C,
 - 1 s on 1 million years thanks to the synchronisation on the DCF Frankfurt transmitter signal for IHP DCF 1c.
- Output contact rating:
 - 16 A under 250 V AC ($\cos \varphi = 1$),
 - 10 A under 250 V AC ($\cos \varphi = 0.6$).

Mechanical data

- Overall dimensions: 5 modules of 9 mm.
- Degree of protection: IP20B.
- Operating temperature: -10 °C to +50 °C.
- Location for instruction manual on the front face for IHP 1c/2c, IHP + 1C/2c and IHP DCF 1c.
- The IHP 1c/2c, IHP +1c/2c are compatible with electrical distribution comb busbars (mechanical compatibility).

Specific data for 1 and 2 channel IHP+

- Manual functions:
 - temporary cancellation of programming for holidays, public holidays, etc. by configuration of the 2 dates - start and end of absence,
 - simulation of presence thanks to random operation during On periods.
- Pulse functions: programming of pulses adjustable from 1 to 59 s (pulse takes priority over switching).
- Back-lighting of the screen.
- Memory key located on front face for saving and duplicating programs.
- External inputs for external control with a standard switch or a push-button (1 input for IHP+ 1c and 2 inputs for IHP+ 2c).
 - characteristics of the input:
 - voltage: 230 V AC, +10 %, -15 %,
 - frequency: 50/60 Hz,
 - input current: max. 1.2 mA,
 - consumption: max. 0.3 mW,
 - cable length: max. 100 m.
- Accessory:
 - programming kit for PC consists of a programming device, a memory key, a CDROM and a 2 m USB cable.
 - memory key for saving and duplicating programs.



IHP DCF 1c



ANT DCF

Specific data for the IHP DCF

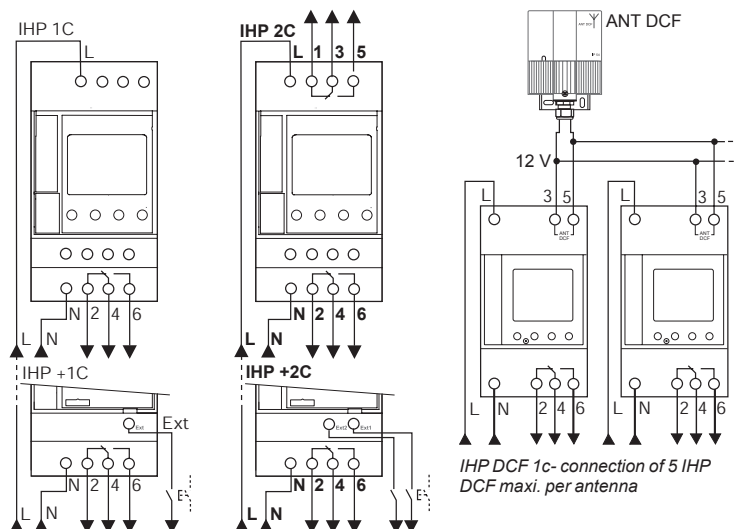
- Synchronisation on the Frankfurt transmitter DCF 77 signal:
 - automatic on commissioning, then at 1 am, 2 am, 3 am and 4 am every day,
 - manual by pressing the IHP keys or after a "reset",
 - displayed on the screen by the letters RC,
 - programming of pulses adjustable from 1 to 59 s (pulse takes priority over switching).
- Manual functions:
 - temporary cancellation of programming for holidays, public holidays, etc. by configuration of the 2 dates - start and end of absence,
 - simulation of presence thanks to random operation during On periods.
- Pulse functions: programming of pulses adjustable from 1 to 59 s (pulse takes priority over switching).

Specific data for the ANT DCF antenna

- Connection: 1.5 mm², 5 IHP DCF maximum per antenna, maximum distance between the IHP DCF and the antenna: 200 m.
- Installation: outside the electrical switchboard, outdoors, under shelter.
- Operating temperature: - 20 °C to + 70 °C.
- Degree of protection: IP54.
- Overall dimensions: L x W x H: 70 x 57 x 92 mm.

Connection

- 1 screw connection per pole for cables up to 6 mm² for IHP 1c (UL) and IHP DCF 1c.
- 2 screwless connection per pole for cables up to 2.5 mm² for IHP 1c/2c and IHP+ 1c/2c.



Catalogue numbers

Designation	Cat. no.
IHP 1c	CCT15720 ⁽¹⁾
IHP+ 1c	CCT15721 ⁽¹⁾
IHP 2c	CCT15722 ⁽¹⁾
IHP+ 2c	CCT15723 ⁽¹⁾
IHP DCF 1c	15857
IHP 1c (UL)	15830 ⁽²⁾
Accessories	
ANT DCF	15858
Programming kit for PC	CCT15860
Memory key	CCT15861

⁽¹⁾ French, english, italian, spanish, german, portuguese.

⁽²⁾ Supply voltage: 120 VAC ±10 %.



IHP + 1c 18 mm.

Function

- These time switches automatically switch on and off loads according to the program entered by the user.
- They operate on weekly cycle: the same program is repeated week after week.
- They offer automatic summer/winter time change, and allow to adjust it according to where you are located.
- The program can be overridden temporary or permanently by pressing 2 keys on the product.

Electrical data

- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50/60 Hz.
- Consumption: 2.5 VA for IHP 1c 18 mm, 3 VA for IHP + 1c 18 mm.
- Saving of program and time by lithium battery:
 - lifetime: 5 years,
 - back-up time, cumulated mains cut off: 3 years.
- Time accuracy: ± 1 s per day at 20 °C.
- Output contact rating:
 - 16 A under 250 V AC ($\cos \varphi = 1$),
 - 4 A under 250 V AC ($\cos \varphi = 0.6$).

Mechanical data

- Overall dimensions: 2 modules of 9 mm.
- Degree of protection: IP20B.
- Operating temperature: -10 °C to +50 °C.
- Mechanical compatibility with electrical distribution comb busbars (only for IHP + 1c 18 mm).

Connection

- 1 screw connection per pole for cables up to 6 mm².



Catalogue numbers

Designation	Cat. no.
IHP 1c 18 mm	15724 ⁽¹⁾
IHP+ 1c 18 mm	15725 ⁽¹⁾

⁽¹⁾ French, english, italian, spanish, german, portuguese.



ITM 4c - 6E.

Function

- Weekly or annual time programming to be distributed over 1, 2, 3 or 4 channels. 6 inputs to condition these functions.
- A removable memory cartridge to duplicate on another ITM or to save the program created by the contractor.

Electrical data

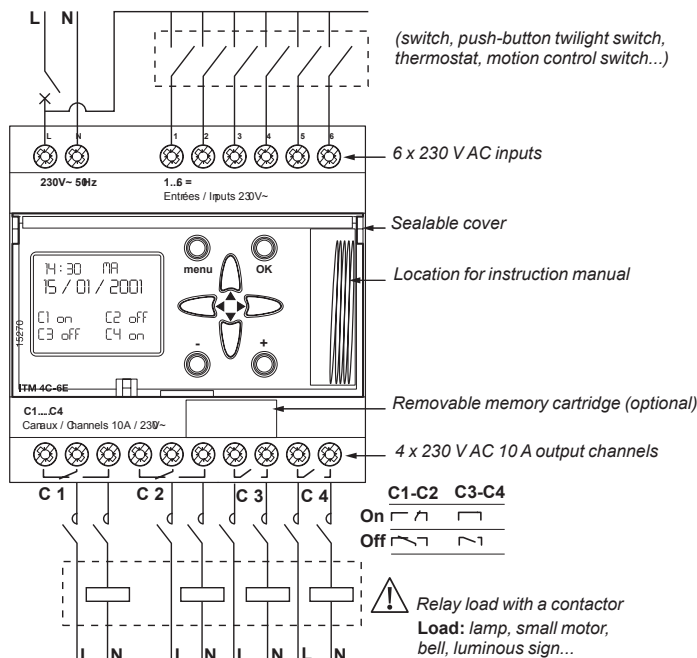
- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50 Hz.
- Consumption: 4.5 VA.
- Saving program and time by lithium battery:
 - lifetime: 10 years,
 - back-up time: 5 years.
- Time accuracy: ± 1 s per day at 20 °C.
- Output contact rating:
 - 10 A under 250 V AC ($\cos \varphi = 1$),
 - 6 A under 250 V AC ($\cos \varphi = 0.6$).

Mechanical data

- Overall dimensions: 10 modules of 9 mm.
- Degree of protection:
 - front face: IP40,
 - terminals: IP20B.
- Operating temperature: -5 °C to +50 °C.

Connection

- 1 screw connection per pole for cables up to 6 mm².



Catalogue numbers

Designation	Cat. no.
ITM4c-6E	15270
Memory cartridge	15280



IH 60mn 1c SRM.



IH 24h 1c ARM.



IH 24h + 7j 1+1c ARM.

Function

- These time switches automatically switch on and off loads according to the program entered by the user.
- They operate on hourly, daily or weekly cycle: the same program is repeated hour after hour (IH 60mn), day after day (IH 24h), week after week (IH 7j).
- The program can be overridden on.

Electrical data

- Voltage: 230 V AC +10 %, -15 % (110- 230 V AC +10 %, -15 % for IH 24h 1c ARM and IH 7j 1c ARM).
- Frequency: 50/60 Hz (50 Hz for IH 60mn 1c SRM, IH 24h + 7j 1+1c SRM).
- Consumption: 2.5 VA (1 VA for IH 60mn 1c SRM).
- Time accuracy: ± 1 s per day at 20 °C.
- Saving on mains cut off by lithium battery (only for ARM types): lifetime: 6 years, back-up time: 150 h (200 h for IH 24h 1c ARM and IH 7j 1c ARM with 230 V AC supply voltage and 100 h for IH 24h 1c ARM and IH 7j 1c ARM with 100 V AC supply voltage).
- Output contact rating: 16 A (10 A for IH 60 mn 1c ARM) under 250 V AC ($\cos \varphi = 1$), 4 A under 250 V AC ($\cos \varphi = 0.6$).

Mechanical data

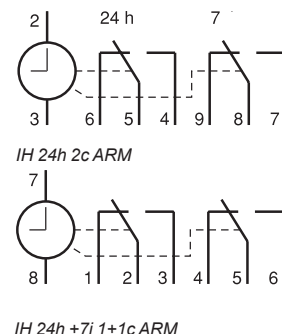
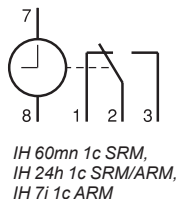
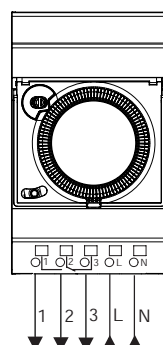
- Programming by jumpers (supplied) or by captive segments:

Type	Number of jumpers supplied
IH 24h 2c ARM	4 red + 4 green + 2 white
IH 24h + 7j 1+1c ARM	6 yellow (24 h), 12 blue + 2 red (7 days)
Type	Number of captive segments
IH 60mn 1c SRM, IH 24h 1c SRM, IH 24h 1c ARM	96
IH 7j 1c ARM	84

- Switch control on front face (only for IH 60mn 1c SRM, IH 24h 1c SRM, IH 24h 1c ARM, IH 7j 1c ARM):
 - ☐ permanent 3 positions switch control (On, auto, Off).
 - ☐ temporarily 2 positions switch control for each segment (On, Off).
- Overall dimensions: 6 modules of 9 mm.
- Degree of protection: IP20.
- Operating temperature: -20 °C to +55 °C.
- Additional jumpers (for IH 24h 2c ARM, IH 24h + 7j 1+1c ARM): they are used to program a larger number of sequences.

Connection

- Screw connection for cables up to 6 mm² (for IH 24h 2c ARM, IH 24h + 7j 1+1c ARM).
- 2 screwless connection terminal per pole for cables up to 2.5 mm² (for IH 60mn 1c SRM, IH 24h 1c SRM, IH 24h 1c ARM, IH 7j 1c ARM).



Catalogue numbers

Designation	Cat. no.
IH 60mn 1c SRM	CCT15338
IH 24h 1c SRM	CCT16364
IH 24h 1c ARM	CCT15365
IH 24h 2c ARM	15337
IH 7j 1c ARM	CCT15367
IH 24h + 7j 1+1c ARM	15366
Accessories	
Additional jumpers (1 bag containing: 5 red, 5 green, 5 white, 5 yellow)	15341



IHH 7j 1c ARM.



IH 24h 1c ARM.

Function

- These time switches automatically switch on and off loads according to the program entered by the user.
- They operate daily or weekly cycle: the same program is repeated hour after hour, day after day (IH 24h), week after week (IH 7j).
- The program can be overridden on or off.

Electrical data

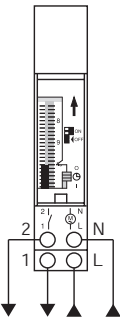
- Voltage: 230 V AC $\pm 10\%$.
- Frequency: 50/60 Hz.
- Consumption: 2.5 VA.
- Saving program and time:
 - lifetime: 10 years,
 - back-up time, cumulated mains cut off: 100 hours (except for IH 24h 1c SRM).
- Time accuracy: ± 1 s per day at 20 °C.
- Output contact rating:
 - 16 A under 250 V AC ($\cos \varphi = 1$),
 - 4 A under 250 V AC ($\cos \varphi = 0.6$).

Mechanical data

- Programming by captive segments.
- Overall dimensions: 2 modules of 9 mm.
- Degree of protection:
 - front face: IP40,
 - terminals: IP20B.
- Operating temperature: -10 °C to +50 °C.

Connection

- 1 screw connection per pole for cables up to 6 mm².



Catalogue numbers

Designation	Cat. no.
IHH 7j 1c ARM	15331
IH 24h 1c SRM	15335
IH 24h 1c ARM	15336

RBN and RTBT interface relays

function

The RBN and RTBT relays are used to interface automated system inputs and outputs with low voltage equipment.

RBN

This relay is used for the control of low power electronic circuits on receipt of a LV electrical order: these electronic circuits can be programmable logic controller (PLC) inputs, measurement or monitoring circuits, etc.

RTBT

This relay is used for the control of LV circuits from an Extra Low Voltage control: these ELV controls can be issued by a PLC (24 V DC static outputs), a fire detection unit, a regulation system, etc.

description

common technical data

- frequency: 50...60 Hz
- green pilot light on the control circuit
- enhanced isolation between ELV/LV circuits: 4 kV
- electrical durability: 100,000 switching operations
- connection: tunnel terminals for 0.5 to 6 mm² cables

specific technical data

RBN

- power circuit:
 - rating (In):
 - min. 5 mA, 5 V AC/DC
 - max. 2 A, 250 V AC
- control circuit:
 - voltage: 230 V AC +/- 10%
 - consumption:
 - inrush: 5 VA
 - holding: 2.5 VA
- complies with standards:
 - IEC 255 100
 - IEC 529

RTBT

- power circuit:
 - rating (In):
 - min. 10 mA, 10 V DC
 - max. 5 A, 250 V AC
- control circuit:
 - voltage:
 - 12...24 V AC - 15..% +10%
 - 12...24 V DC ± 20%
 - consumption:
 - inrush: 0.22 W
 - holding: 0.11 W

catalogue numbers



15393



15416

type

RBN



Cat. no

Width in
mod.
of 9 mm

15393

2

RTBT



15416

2

additional
information

dimensions: page D89

function	RCP The phase control relay monitors phase order and asymmetry as well as voltage presence on all 3 phases of a three-phase circuit (motor supply, etc.). It reports phase loss or reversal. RCI The current control relay monitors the current flowing in a circuit and reports when the preset threshold is reached.	RCU The voltage control relay monitors the potential difference of a circuit and reports when the preset threshold is reached. RCC The compressor control relay monitors the compressor power supply and prevents its immediate restart on detection of a voltage break or drop.
description	common technical data ■ parameter setting: □ on the front face □ by direct scale □ using a screwdriver ■ display accuracy: $\pm 10\%$ full scale ■ utilisation frequency: 50...60 Hz ■ utilisation temperature: $-5...+55\text{ }^{\circ}\text{C}$ ■ consumption: 3 VA ■ indication: □ green LED for power ON □ red LED for fault ■ output by 8 A changeover switch under 250 V AC ($\cos \varphi = 1$) ■ connection: tunnel terminals for rigid cables from 1.5 to 6 mm² specific technical data RCP ■ operating voltage: 400 V AC, $\pm 15\%$ ■ phase asymmetry threshold setting: 5...25 % ■ hysteresis: fixed, 5% of asymmetry threshold ■ phase rotation direction monitoring ■ 3 phase presence monitoring ■ time delay on tripping: 0.3 s RCI ■ measurement: □ range: 0.15...10 A □ automatic recognition of AC and DC current □ 2 measurement ranges selected by wiring: - 0.15...1.5 A - 1...10 A ■ overcurrent and undercurrent monitoring (selection by selector switch) ■ threshold adjustable from 10...100 % ■ hysteresis adjustable from 5...50 % ■ failsafe contact ■ time delay on threshold reached: 0.1...10 s ■ power supply: 230 V AC ■ optional fault memorisation with reset ■ compatible with TI current transformers with an X/5 ratio	RCU ■ measurement: □ range: 10...500 V □ automatic recognition of AC and DC voltage □ 2 measurement ranges selected by wiring: - 10...50 V - 50...500 V ■ overvoltage and undervoltage monitoring (selection by selector switch) ■ threshold adjustable from 10...100 % ■ hysteresis adjustable from 5...50 % ■ failsafe contact ■ time delay on threshold reached: 0.1...10s ■ supply voltage: 230 V AC ■ optional fault memorisation with reset RCC ■ operating voltage: 230 V AC ■ threshold setting: $\pm 5... \pm 15\%$ voltage drop ■ time delay on threshold reached: 3 or 6 minutes (selection by wiring)

RC control relays

RCP phase control, RCI current control, RCU voltage control and RCC compressor control relays

catalogue numbers



21180



21181



21182



21183

type	catalogue number	Width in mod. of 9 mm
RCP	21180	4
RCI	21181	4
RCU	21182	4
RCC	21183	4

additional information

dimensions: page D94

Time delay relays, an alternative to conventional industrial relays, benefit from the assets provided by modular size.

They have a very wide field of application in commercial and industrial buildings for simple automatic functions: ventilation, heating, coordination and interlocking of roller blinds, escalators, pumps, lighting, signs, monitoring, etc.

Function

RTA

Delays energisation of a load.

RTB

Applies a time delay to energisation of a load on closing of an auxiliary contact (pushbutton).

RTC

Delays energisation of a load on closing of an auxiliary contact (pushbutton).

RTH

Applies a time delay to energisation of a load.

RTL

Applies a time delay to energisation and de-energisation of a load for different periods of time, repeatedly (flashing indicator).

RTMF

Lets you select one of the 4 time delay types: A, B, C or H.

Technical data

- Time delay range: 0.1 s to 100 h.
- Control circuit:
 - control and supply voltage:
 - 24 V DC $\pm 10\%$
 - 24...240 V AC $\pm 10\%$
 - RTMF: 12...240 V AC/DC $\pm 10\%$
- frequency: 50...60 Hz.
- Operating temperature: -5...+55 °C.
- Power circuit:
 - changeover switch (without cadmium)
 - minimum rating: 10 mA/5 V DC
 - maximum rating: 8 A/250V DC and 8 A/250 V AC
- mechanical durability: > 5.106 operations
- electrical durability: > 105 operations (utilisation category AC1).
- Accuracy: $\pm 10\%$ full scale.
- Minimum control impulse duration: 100 ms.
- Maximum resetting time by voltage break: 100 ms.
- Repetition accuracy: $\pm 0.5\%$ with constant parameters.
- Visualisation of contact status by green indicator light (flashing during the time delay).
- Unaffected by brownouts y 20 ms.
- Case protection: IP40.
- Connection by tunnel terminals:
 - 2 x 2.5 mm² single-strand cable without end
 - 2 x 1.5 mm² multi-strand cable with end.

RTA, RTB, RTC, RTH, RTL and RTMF time delay relays

Specific technical data

RTA

The single time delay cycle starts on energisation of the supply of the RTA relay
The load is energised at the end of time delay T.

RTB

The single time delay cycle starts on closing of an auxiliary contact (pushbutton).
At the end of time delay T, the load is de-energised.

RTC

The single time delay cycle only starts when an auxiliary contact is released (pushbutton).
At the end of time delay T, the load is de-energised.

RTH

The single time delay cycle starts on energisation of the supply of the RTH relay
The load is de-energised at the end of time delay T.

RTL

The time delay cycle starts on energisation.
The load is energised for an adjustable time T1, then de-energised for an adjustable time T2. This cycle is repeated until the RTL relay supply is de-energised.

RTMF

As applicable, the RTMF generates the time delay cycles of the RTA, RTB, RTC or RTH relays.

Catalogue numbers



16065



16066



16067



16068



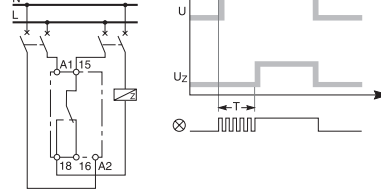
16069



16070

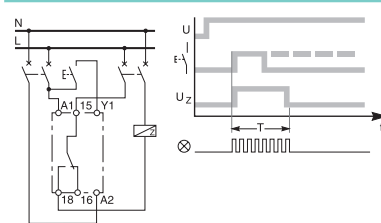
RTA

Type	Cat. no.	Width in mod. of 9 mm
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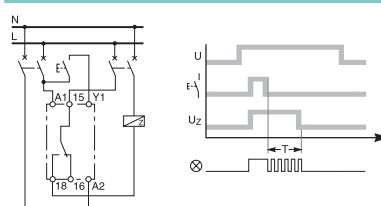
RTB

16066	2
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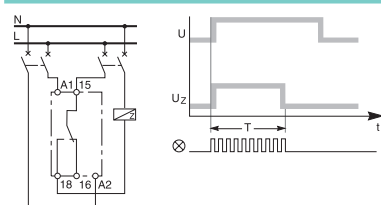
RTC

16067	2
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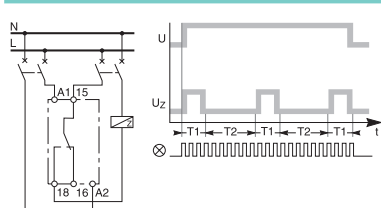
RTH

16068	2
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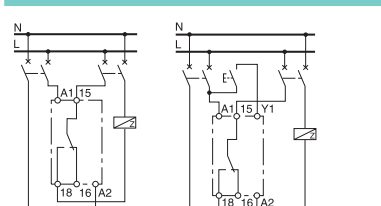
RTL

16069	2
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RTMF

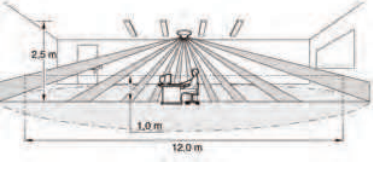
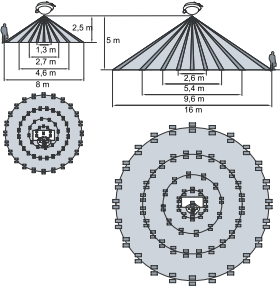
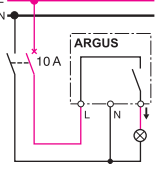
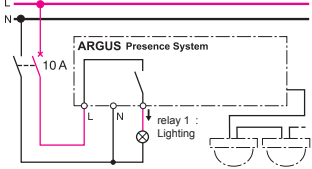
16070	2
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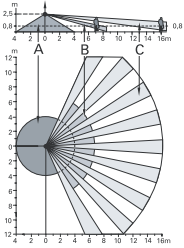
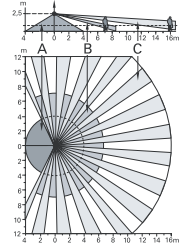
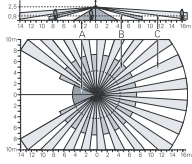
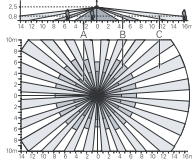
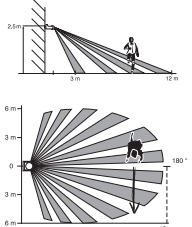
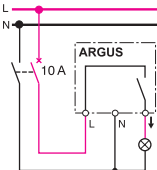
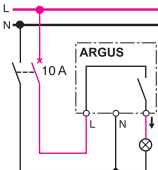
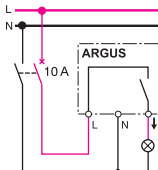
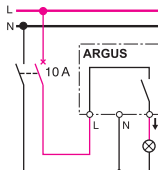
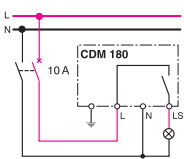


D
VI

Command Control
Lighting management

Presence and movement detectors
choice table

Type	Presence Detectors Argus Presence	Argus Presence System
 Energy saving Presence detection: ■ Presence detectors control switching on of lighting if presence is detected or if movement is detected for a dozen of centimeters - of very low amplitude - and if the ambient brightness is less than the set threshold. (Example: a person sitting in front of a desk) ■ Presence detectors control switching off of lighting if the external light exceeds the threshold, even in the event of movement. Presence detection with Argus Presence System: ■ System consists of a main enclosure and one or more presence detectors connected in series (8 detectors max.) ■ Allows accurate detection, for example through a corridor or a big room. The activation of the device is determined by the presence detector which detected the last movement. Movement detection: ■ Movement detectors control switching on of lighting if presence is detected or if movement is detected with amplitude of several meters and if the ambient brightness is less than the set threshold. (Example: movement of people) ■ After the last movement detected, movement detectors control switching off of lighting on completion of a time delay that can be set beforehand.	 	 (Provided with a main enclosure, 1 detector connected, 1 connection cable 2,5m) 
Reference	MTN550590	MTN550499
Characteristics		
installation	ceiling	ceiling
Detection angle	360°	360°
Range/Radius	12 m	4 m
at a height of 2.5m	14 m	4 m
Use	Interior	Interior
Lighting Time	relay 1 : 10 s... 30 min relay 2 : 5 min...2 h	relay 1 : 10 s... 30 min relay 2 : 5 min...2 h
Brightness threshold setting	10...1000 lux	10...1000 lux
Protection index IP	IP 20	IP 20
Lighting types	Incandescent Halogen Fluorescent	2300 W 2000 W 1000 W
Other lighting types (of higher power)	Relay is obligatory	Relay is obligatory
Power supply	230 V AC	230 V AC
Consumption	< 1 W	2 W (for 8 detectors)
Operating temperature	-15...+40 °C	-15...+40 °C
Accessories		MTN550419
Argus Presence System sensor (provided with 8 m connection cable)	-	
Fixing base (for surface mounting installation)	MTN550619	-
Right angle assembling (for interior and exterior corners and pipes)	-	-
Extension (to move detector away from wall)	-	-
Scheme (permanent functioning)		

Movement Detector Argus 110	Argus 220	Argus 300	Argus 360	CDM 180
 	 	 	 	 
A = 360° radius 4 m B = 110° 9 m x 18 m C = 110° 12 m x 24 m	A = 360° radius 4 m B = 220° 9 m x 18 m C = 220° 12 m x 24 m	A = 360° radius 4 m B = 300° radius 7 m C = 300° 16 m x 20 m	A = 360° radius 4 m B = 360° radius 7 m C = 360° 16 m x 20 m	
MTN565119	MTN565219	MTN564319	MTN564419	16974
wall or ceiling	wall or ceiling	wall	ceiling	wall
110°	220°	300°	360°	180°
-	-	-	-	-
12 m	12 m	16 m	16 m	6 à 12 m
Interior exterior	Interior exterior	Interior exterior	Interior exterior	Interior exterior
1 s...8 min	1 s... 8 min	1 s...8 min	1 s...8 min	5 s...12 min
3...1000 lux	3...1000 lux	3...1000 lux	3...1000 lux	2...1000 lux
IP 55	IP 55	IP 55	IP 55	IP 44
2000 W	2000 W	3000 W	3000 W	1000 W
1200 W	1200 W	2500 W	2500 W	1000 W
1200 W	1200 W	-	-	10 x 40 W
Relay is obligatory	Relay is obligatory	Relay is obligatory	Relay is obligatory	Relay is obligatory
230 V AC	230 V AC	230 V AC	230 V AC	230 V AC
< 1 W	< 1W	< 1 W	< 1 W	< 0,8 W
-15...+40 °C	-15...+40 °C	-15...+40 °C	-15...+40 °C	-20...+50 °C
-	-	-	-	-
-	-	-	-	-
MTN565291	MTN565291	-	-	-
-	-	MTN554399	-	-
				

Choice table

	IC 100	IC 2000		IC 2000P+	IC Astro IC Astro 1C
Catalogue numbers	15482	CCT15284	CCT15368	15483 ⁽¹⁾	CCT15223 ⁽²⁾ CCT 15224 ⁽³⁾
Number of channels	1	1	1	1	1
Control by brightness detection	■	■	■	■	
Coupling with weekly programming				42 switching times	84 switching times
Control by calculation of sunrise/sunset times					■
Technical data					
Adjustable brightness threshold	2 to 100 lx	2 to 2000 lx	2 to 2000 lx	2 to 50 lx 60 to 300 lx 350 to 2100 lx	According to sunrise/sunset times
Voltage (+10 %, -15 %)	230 V AC	230 V AC	230 V AC	230 V AC	230 V AC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Consumption	6 VA	6 VA	6 VA	3 VA	3 VA
Operating temperature	-20 to +50 °C	-25 to +55 °C	-25 to +55 °C	-20 to +50 °C	-25 to +45 °C
Width (9 mm modules)	2	5	5	5	5
Output contact rating cos φ = 1 cos φ = 0.6	16 A 10 A	16 A 10 A	16 A 10 A	16 A 10 A	16 A 10 A
Time delays (On and Off)	20 s (On) 80 s (Off)	≥ 60 s	≥ 60 s	Adjustable from 20 to 140 s	Difference in sunset and/or sunrise times adjustable separately by ±120 min.
Monitoring indicator light, not time delayed, lit when brightness is less than the threshold	Red	Red	Red		
Contact switching indicator light	Green	Green	Green		
LCD liquid crystal display				Back-lit	Back-lit
Program saving by lithium battery				■	■
Operating reserve				5-6 years	6 years
Location for instruction manual on front face		■	■	■	■
Cabling test function with a push-button on front face		■	■		
1 screw connection per pole	■			■	
2 screwless connection per pole		■	■		■
Mechanical compatibility with electrical distribution comb busbars	■				■
Delivered with standard switchboard cell		■			
Delivered with standard wall-mounted cell	■		■	■	
Delivered with digital wall-mounted cell					
Delivered with memory key					

(1) English, french, spanish, italian, german, portuguese, swedish, dutch, finnish, norwegian/danish languages.

(2) English, french, spanish, portuguese, hungarian, polish, romanian, czech, slovak, bulgarian, greek, slovene, serbian, croatian languages.

(3) English, french, italian, german, swedish, dutch, finnish, danish, russian, ukrainian, latvian, lituanien, estonian, turkish languages.

Cell choice table for spare parts

	Cat. no.
IP65 standard switchboard cell for IC 2000 (CCT15284)	15281
IP54 standard wall-mounted cell for IC 100, IC 2000 (CCT15368), IC 2000P+	CCT15268



IC 2000 standard
switchboard cell,
15281



IC 2000 standard
wall-mounted cell,
CCT15268



IC 100 with wall-mounted cell

Function

The IC100 controls closing of a contact when brightness decreases and drops below the selected threshold. It controls opening of a contact when brightness increases and rises above the selected threshold.

Technical data

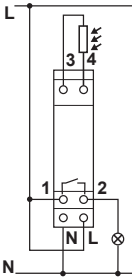
- Adjustable brightness threshold: 2 to 100 lux.
- Time delay: on closing: 20 s, on contact breaking: 80 s.
- Voltage: 230 V AC +10 %, -15 %.
- Frequency: 50/60 Hz.
- Consumption: 6 VA.
- Operating temperature: -20 to +50 °C.
- Contact opening: < 3 mm.
- Insulation class: class II.
- Degree of protection: IP20B.
- Mechanical compatibility with electrical distribution comb busbars.
- Delivered with wall-mounted cell and its fixing device.
- Output contact rating: 16 A under 250 V AC ($\cos \varphi = 1$), 10 A under 250 V AC ($\cos \varphi = 0.6$).

Wall-mounted cell

- Delivered with its fixing device.
- Replaced by CCT15268 for spare part use.
- Cell connection: by double insulation 2-conductor cable, not to be laid next to mains cables or water ducts, maximum length: 25 m.
- Degree of protection: IP54, IK05.
- Operating temperature: -40 °C to +70 °C.

Connection

1 screw connection terminal per pole for cables up to 6 mm².



Catalogue numbers

Type	Cat. no.
IC 100 with wall-mounted cell	15482

P116857



IC 2000 (CCT15284) with standard switchboard cell



P116858



IC 2000 (CCT15368) with standard wall-mounted cell



Function

The IC 2000 control closing of a contact when brightness decreases and drops below the selected threshold. They control opening of a contact when brightness increases and rises above the selected threshold.

Technical data

- Adjustable brightness threshold: 2 to 2000 lx.
- Time delay on contact closing and breaking: 60 s.
- Voltage: 230 V AC +10 %, -15 %.
- Frequency: 50/60 Hz.
- Consumption: 6 VA.
- Operating temperature: -25 to +50 °C.
- Cabling test function with a push-button on front face.
- Contact opening: < 3 mm.
- Insulation class: class II.
- Degree of protection: IP20B.
- Location for instruction manual on the front face.
- Delivered with switchboard cell or wall-mounted cell with its fixing device.
- Output contact rating: 16 A under 250 V AC ($\cos \varphi = 1$), 10 A under 250 V AC ($\cos \varphi = 0.6$).

Standard switchboard cell (delivered with IC2000, CCT15284)

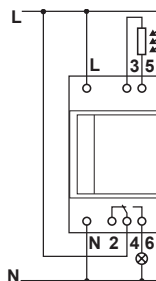
- Delivered with 1 m cable and its fixing device.
- Degree of protection: IP65.
- Operating temperature: -40 °C to +70 °C.

Standard wall-mounted cell (delivered with IC2000, CCT15368)

- Delivered with its fixing device.
- Cell connection: by double insulation 2-conductor cable, not to be laid next to mains cables or water ducts, maximum length: 100 m.
- Horizontally orientable (90°).
- Degree of protection: IP54, IK05.
- Operating temperature: -40 °C to +70 °C.

Connection

2 screwless connection terminal per pole for cables up to 2.5 mm².



Catalogue numbers

Type	Cat. no.
IC 2000 with switchboard cell	CCT15284
IC 2000 with wall-mounted cell	CCT15368



IC2000P+ with wall-mounted cell

Function

The IC 2000P+ controls lighting according to brightness and time. If brightness drops below the set threshold (twilight function: IC) and if the time program allows relay closing (time switch function), then the lighting circuit is activated.

Description

The IC 2000P+ uses its time programming to define lighting On and Off periods:

- According to three pre-set time programs:
 - "DAYPROG": On time programming from 7 am to 8 pm a validation of the IC function from 7 am to 8 pm,
 - "NIGHTPROG": On time programming from 5 am to 8 am and from 6 pm to 11 pm a validation of the IC function on these two operating periods,
 - "EMPTYPROG": Off time programming throughout the day a no validation of the IC function. These programs can be modified if necessary.
- According to a customised operating period, with possibility of copying to the other days. It is equipped with the following functions:
 - consideration of periods of absence (holidays),
 - temporary or permanent On or Off override,
 - remote control of lighting override by NO external contact,
 - consideration of change to "summer/winter" time, automatic or manual,
 - permanent liquid crystal display: of time and minutes, of day of the week, of the contact output status and current program.

Technical data

- Adjustable brightness threshold over 3 ranges: range 1: 2 to 50 lx, range 2: 60 to 300 lx, range 3: 350 to 2100 lx.
- Voltage: 230 V AC +10 %, -15 %.
- Frequency: 50/60 Hz.
- Consumption: 3 VA.
- Operating temperature: -20 to +50°C.
- Time delay on contact closing and breaking: separate setting between 20 s and 140 s (80 s by default).
- Operating accuracy: $< \pm 1$ s / day at 20 °C.
- Number of separate switching operations: 42.
- Minimum switching: 1 min.
- Switching accuracy: 1 s.
- Insulation class: class II.
- Degree of protection: IP20B.
- Output contact rating: 16 A under 250 V AC ($\cos \varphi = 1$), 10 A under 250 V AC ($\cos \varphi = 0.6$). Contact: potential free.

Wall-mounted cell

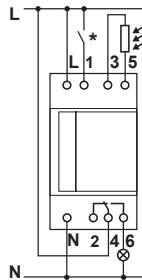
- Delivered with product and its fixing device.
- Replaced by CCT15268 for spare part use.
- Photoresistance, connection by 2-wire cable, 100 m max. Do not install parallel to mains cables.
- Degree of protection: IP54, IK05.
- Operating temperature: -40 °C to +70 °C.

External input

- Voltage: 230 V AC, +10 %, -15 %.
- Frequency: 50/60 Hz.
- Input current: max. 2.5 mA.
- Consumption: max. 0.4 mW.
- Cable length: max. 100 m.

Connection

1 screw connection terminal per pole for cables up to 6 mm².



* On override
external contact

Catalogue numbers

Type	Cat. no.
IC 2000P+	15483



IC Astro 1C

Function

The IC Astro astronomical programmable twilight switch is used to start and stop an electric load (e.g. lighting) according to sunrise and sunset times, without a brightness detector. Sunrise and sunset times are calculated automatically by the IC Astro according to the geographic parameters configured by the user.

Description

The IC Astro is configured according to the place of installation.

- The place of installation of the IC Astro can be configured:
 - either by selecting a country and a town,
 - or by its geographic coordinates (latitude, longitude).
- The IC Astro allows:
 - addition or deletion of a switch-off/switch-on switching operation (Off-On) between the sunset and sunrise times,
 - different programmes each day,
 - difference in sunset and/or sunrise times, adjustable separately by ± 120 min. according to local constraints (mountains, buildings, etc.),
 - consideration of periods of absence (holidays),
 - remote control of lighting override by external standard switch or push-button via the external input (1 external input per channel),
 - re-initialisation of programmes,
 - automatic switching to "summer-winter" time,
 - permanent display by liquid crystals: hours and minutes, day of the week, contact output status, and current programme,
 - manual waiver of the lighting On/Off programme, permanently or temporarily (up to the next switching operation).
 - back-lighting of the screen.

Technical data

- Voltage: 230 V AC $\pm 10\%$, -15% .
- Frequency: 50/60 Hz.
- Consumption: 3 VA (IC Astro 1C)
- Operating temperature: -25 to $+45^\circ\text{C}$.
- Number of separate switching operations: 84 (not including sunrise/sunset).
- Minimum time between 2 switching operations: 1 min.
- Switching accuracy: 1 s.
- Time accuracy: ± 1 s /day.
- Programming longitude: -180° (East) to $+180^\circ$ (West) in steps of 1° .
- Programming latitude: -90° (South) to $+90^\circ$ (North) in steps of 1° .
- Degree of protection: IP 20B.
- External inputs for external control with a standard switch or a push-button (1 input Ext1 for IC Astro 1C)
- Consumption: < 0.5 mA.
- cable length: max. 100 m.
- Location for instruction manual on the front face.
- Mechanical compatibility with electrical distribution comb busbars.
- Output contact rating: 16 A under 250 V AC ($\cos \varphi = 1$), 10 A under 250 V AC ($\cos \varphi = 0.6$).

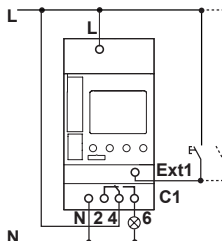


Programming kit

- Programming accessories:
 - programming kit for PC consists of a programming device, a memory key, a CDROM and a 2 m USB cable.
 - memory key for saving and duplicating programs.

Connection

2 screwless connection per pole for cables up to 2.5 mm².



IC Astro 1C

Catalogue numbers

Type	Languages	Cat. no.
IC Astro 1C (1 channel)	(1)	CCT15224

Accessories

Programming kit for PC	CCT15860
Memory key	CCT15861

(1) English, french, italian, german, swedish, dutch, finnish, danish, russian, ukrainian, latvian, lituanien, estonian, turkish languages.

Practicle advices

Configuration

This consists of writing in the memory:

- the language,
- the place of installation, either:
 - by its position (Argentina, China, etc.) and by the closest town,
 - by its geographic coordinates (latitude, longitude, time difference with respect to GMT) (a map is provided with the product).
- the year, month, day and time.
- Once this phase is complete, IC Astro will calculate the sunrise and sunset times and propose a default programme (operation from sunset to sunrise), see Fig.1.

Programming an Off period

The IC Astro offers the possibility of adding an "Off" period (programmed switch-off and switch-on) inside the programme, between the sunrise and sunset times (by default it is proposed from 11 pm to 5 am), see Fig.2.

Modifying programming and configuration

The twilight switch allows:

- creation of a new customised programme with possibility of copying onto the other days,
- display of programmes in memory,
- deletion, modification or addition of an automatic or programmed switching operation,
- partial or total deletion of the programme (date, time and language are kept),
- modification of time, date, summer/winter time,
- temporary cancellation of the "On" periods by configuring start and end dates and Times of absence (holidays),
- adjustment of difference in sunset and/or sunrise times by ± 120 min. according to local constraints (mountains, buildings, etc.), see Fig.3.

Move to On/Off override (see Fig.4)

- Briefly press (< 2 s) at the same time on the 2 keys "-", "+": (value setting and navigation keys) on the front face to move to "ON TEMP" or "OFF TEMP".
 - Hold down (> 2 s) the keys to move to "ON PERM" or "OFF PERM".
 - The supply of input 5 forces the IC Astro output to the "ON" position.
- This override takes priority over the product On/Off override function.



Fig. 1: Paris, 20th June, sunset 10 pm and sunrise 6 am.

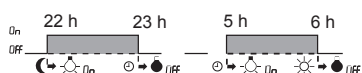


Fig. 2



Fig. 3

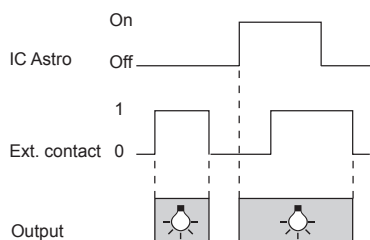


Fig. 4



IC 50

Function

This switch controls closing of a contact when brightness drops below a pre-set level.

It controls opening of the same contact when brightness rises above a pre-set level.

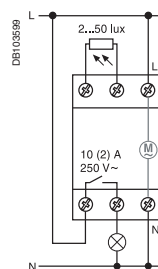
Technical data

- Voltage rating: 230 V.
- Frequency: 50 Hz.
- Consumption: 2.2 VA.
- Photoelectric cell (supplied with fasteners):
 - adjustable brightness threshold: 2 to 50 lux
 - the monitoring LED comes on as soon as the set threshold is reached.
- Time-delay on making and breaking of contact: 10 seconds.
- Contact rating:
 - 10 A - 250 V ~, Cos φ = 1 (resistive)
 - 2 A - 250 V ~, (inductive)
 - maximum power controlled:
 - 250 V LV halogen or incandescent lighting: 1000 W
 - series corrected or non-corrected fluorescent lighting: 400 VA
 - parallel-corrected fluorescent lighting (18 μF): 120 VA.
- Degree of protection:
 - IC 50: IP 20 as per EN 60529
 - cell: IP 54.
- Connection:
 - IC 50: by tunnel terminal, for cables up to 6 mm² (it is important to comply with phase L/neutral N polarity)
 - cell: by 2-conductor cable, do not place next to the power cables.
- Operating temperature: -10°C to +40°C.
- Weight (g):
 - IC 50: 105
 - cell: 43.

Catalogue number

Type	Width in mod. of 9 mm	Cat. no.
IC 50	4	15267

Connection



CDS load-shedding contactor

Function

CDS

When consumption exceeds the selected threshold, the load-shedding contactor temporarily stops supply to non-essential circuits.

The CDS:

- increases the number of loads without changing output power,
- reduces output power,
- prevents nuisance tripping of the upstream circuit-breaker.

Description

technical data common to the CDS

- ratings:
 - essential circuit: 90 A
 - non-essential circuits:
 - 15 A contact relay (100 000 operations) for resistive loads without current inrush on energisation
 - in all other cases, relaying by CT contactor is required
- frequency: 50...60 Hz
- load-shedding indication by yellow LEDs
- power consumption: 12 VA
- connection by tunnel terminals (captive screws):
 - essential circuit: 4 to 50 mm²
 - non-essential circuits: 2.5 to 10 mm²
- fixing on symmetrical rail or panel
- control of currents greater than 90 A:
 - utilisation of an In/5 current transformer
 - threshold setting: 5 A
- utilisation temperature: -5...+55 °C
- complies with standards:
 - NFC 61.750
 - EN 500 81.1
 - EN 500 81.2

specific technical data

CDS

- single-phase version:
 - load-shedding and restoration in cascading configuration of 2 non-essential circuits by 2 relays with time-delayed action
 - load-shedding time:
 - load shedding of circuit 1 only:
 - restoration after 5 min
 - load shedding of circuit 1 and circuit 2:
 - restoration of circuit 2: after 10 min
 - restoration of circuit 1: 5 min after circuit 2
- three-phase version:
 - separate load-shedding for each phase
 - 1 relay per phase
 - load-shedding time: 5 min for each channel
 - load-shedding override input
 - 1 A - 250 V NO contact for remote indication

CDS_c

- load-shedding and restoration in cascading configuration, then in turn by rotation of 1 to 4 non-essential circuits
- load-shedding override input
- cyclic load-shedding: changing the order every 5 min.



15908

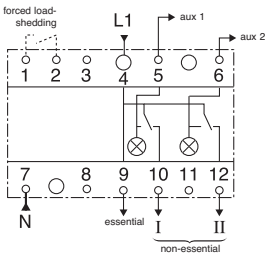


15913

Type	threshold (A)	supply (VAC)	catalogue number	width in mod. of 9mm
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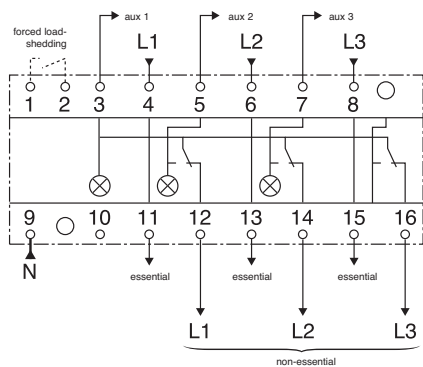
CDS				
1P	5/10/15/20/25/30 40/45/50/60/75/90	230	15908	10

E577988



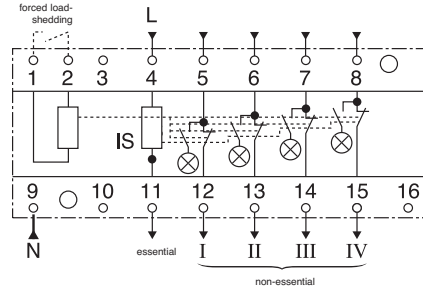
3P	5/10/15/20/25/30 40/50/60/70/80/90	230	15913	16
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E577989



CDSc				
1P	5/10/15/20/25/30 40/45/50/60/75/90	230	15906	16

E577990



STD- SCU range

STD400RC/RL-DIN & SAE

STD1000RL-DIN & SAE

SCU10-DIN & SAE



STD400RC/RL-DIN



STD400RC/RL-SAE



STD1000RL-SAE



SCU10-SAE

Function

- STD and SCU dimmers modulate lighting brightness for unit powers from 40 to 1500 W from one or more switch-on points.
- They can be controlled either with the local control push-button placed on front panel or with auxiliary push-buttons.
- They have soft-On / soft-Off, light level memory and minimum level setting features.
- They are available in 2 different types:
 - DIN type (STD400RC/RL-DIN, STD1000RL-DIN and SCU10-DIN) supplied without digital inputs,
 - SAE type (STD400RC/RL-SAE, STD1000RL-SAE and SCU10-SAE) supplied with 4 digital inputs.

Common technical data for DIN&SAE types

- Local push-button: short push for On/Off control, long push for dimming.
- Auxiliary push-button input: short push for On/Off control, long push for dimming.
- up to 25 parallel connected auxiliary push-buttons without indication lamps.
- up to 5 parallel connected auxiliary push-buttons with indication lamps.
- max wire length 50 m.
- The minimum light level setting is adjustable.
- Indication blue LED (built in the local push-button) illuminates during the on-state. The LED is blinking in error mode.
- Protection and fuses:
 - electronic overload protection,
 - electronic overvoltage protection,
 - electronic over temperature protection,
 - single shot thermal fuse.
- Supply voltage: 230 V AC $\pm 10\%$, 50 Hz.
- Power loss: 3 W.
- Standby consumption: 0.8 VA.
- Current sink for 1-10 V output: 0.2- 100 mA,
- Operating temperature: 0 °C to +40 °C , 40 °C to +70 °C with - 6 W /°C de-rating.
- Storage temperature: 0 °C to +60 °C.
- Degree of protection: IP 20.
- Standards: according to EN 60669-2-1.
- Directives: according to CE, EMC 89/336/EEC and LVD 73/73/23/EEC.

Specific technical data for SAE type

- The STD400RC/RL-SAE, STD1000RL-SAE and SCU10-SAE dimmers are supplied with 4 digital inputs:
 - input 1: On/Off and dimming up/down or only On and dimming up (depends on function mode).
 - input 2: Off and dimming down or only Off (depends on function mode).
 - input 3: adjustable lighting level memory 1 (50% default).
 - input 4: adjustable lighting level memory 2 (100% default).
- Input voltage: 12- 30 V AC/ DC.
- Max wire length: 50m.
- Up to 25 push-buttons per input. No push-button with indication lamp.
- STD400RC/RL-DIN and STD400RC/RL-SAE dimmers are power regulators designed for all dimmable load types. Dimmers have automatic load type detection and the load regulation method is adjusted to fit the load.

Load table

STD400RC/RL-DIN, STD400RC/RL-SAE	
230 V incandescent and halogen lamps	40 - 400 W
Low voltage halogen lamps with electronic or conventional transformer	40 - 400 W
Low voltage halogen lamps with toroidal transformer	40 - 300 W
Motors (fans, ventilators...)	40 - 200 W
STD1000RL-DIN, STD1000RL-SAE	
230 V incandescent and halogen lamps	60 - 1000 W
Low voltage halogen lamps with conventional transformer	60 - 1000 W
Low voltage halogen lamps with toroidal transformer	60 - 1000 W
Motors (fans, ventilators...)	60 - 600 W
SCU10-DIN, SCU10-SAE	
Mono fl uorescent tubes with electronic ballast (dia.26 mm)	50 x 18 W, 40 x 36 W, 25 x 58 W
Duo fl uorescent tubes with electronic ballast (dia.26 mm)	40 x 18 W, 20 x 36 W, 12 x 58 W
Fluocompact lamps with electronic ballast	50 max. up to 1500 W

STD- SCU range

STD400RC/RL-DIN & SAE

STD1000RL-DIN & SAE

SCU10-DIN & SAE



Common operation for SAE&DIN versions

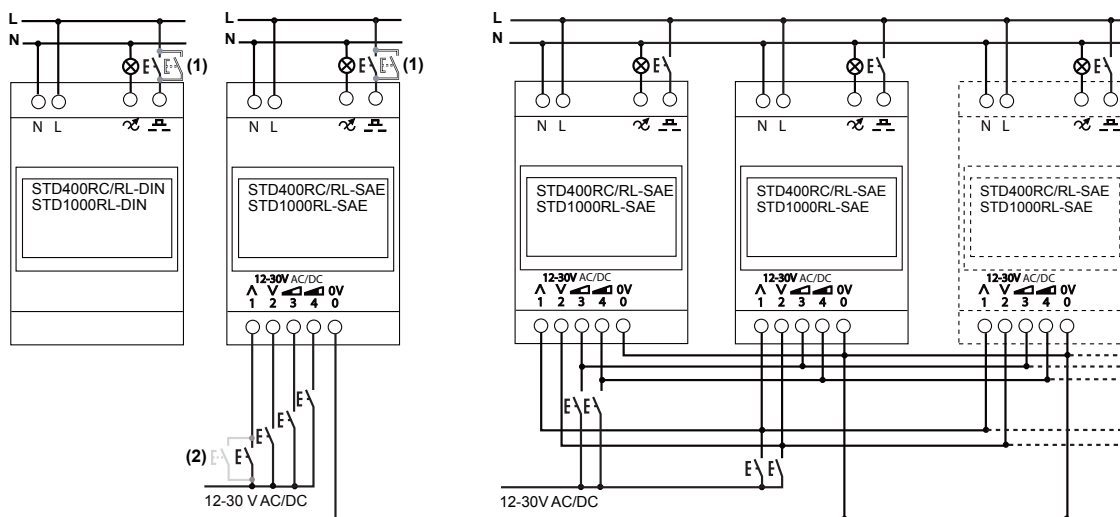
- The dimmer is turned On/Off by shortly pushing the front panel push-button. This push-button lights blue when the dimmer is On.
- The light level is controlled by keeping the front panel push-button pushed until wanted level has been reached.
- The direction of dimming (up/down) is changed every time the front panel pushbutton is released.
- The dimmer has memory function which stores the light level before Off-command. When the dimmer is turned back On, the light level is the same as it was before Off-command.
- Auxiliary push-buttons connected on $\underline{A}$ terminal have the same functionality as the push-button on the front panel of the dimmer.

Specific operation for SAE type

- **STD400RC/RL-SAE, STD1000RL-SAE and SCU10-SAE** dimmers have 2 different operation modes (A and B) using auxiliary push-buttons connected on digital inputs (1, 2, 3 and 4 terminals).
- Modes A and B can be changed by pushing the digital inputs 3 and 4 simultaneously for 10 s. After the mode is changed the load and the LED start to blink as long as the inputs are pushed.
- In the mode A, the input 1 dims the lights on with a short push and up with a long push and turns light off with a short push and dims the light down with a long push. The direction is changed every time the input 1 is released. The input 2 dims the lights always off.
- In the mode B, the input 1 dims lights only up with a long push and turns lights on with a short push. The input 2 dims the lights only down with a long push and turns lights off with a short push.
- Inputs 3 and 4 are for memory places for light levels. The light level is called with a short push and set into the memory with a long push of 3 s.

STD dimmers connection

- Top connection terminals: 2-pole screw connection for cables up to 4 mm².
- Bottom connection terminals only available for SAE type: 5-pole screw connection for cables up to 2.5 mm².
- With SAE types, it is possible to control a maximum of 20 dimmers combining STD400RC/RL-SAE and STD1000RL-SAE, with only one push-button via the 4 digital inputs.



(1) Use of maximum 25 push-buttons without indication lamp and 5 push-buttons with indication lamp, connected in parallel

(2) Use of maximum 25 push-buttons without indication lamp, connected in parallel, only for STD400RC/RL-SAE and STD1000RL-SAE

STD- SCU range

STD400RC/RL-DIN & SAE

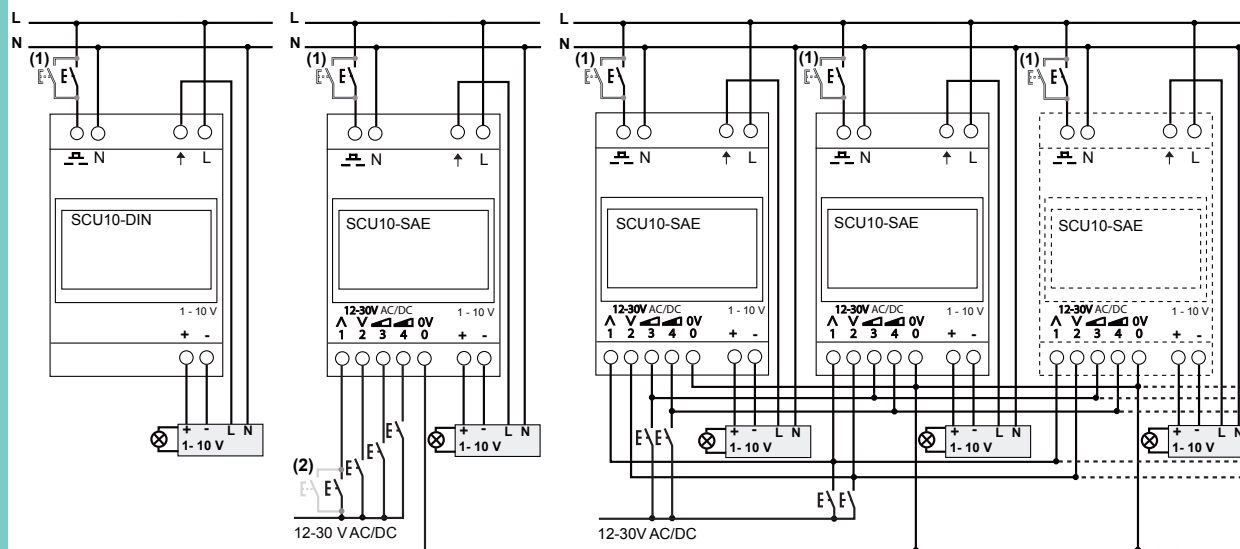
STD1000RL-DIN & SAE

SCU10-DIN & SAE



SCU dimmers connection

- Top connection terminals: 2-pole screw connection for cables up to 4 mm².
- Bottom connection terminals only available for SAE type: 5-pole screw connection for cables up to 2.5 mm².
- With SAE types, it is possible to control a maximum of 20 dimmers combining STD400RC/RL-SAE, STD1000RL-SAE and SCU10-SAE with only one push-button via the 4 digital inputs.



- (1) Use of maximum 25 push-buttons without indication lamp and 5 push-buttons with indication lamp, connected in parallel
- (2) Use of maximum 25 push-buttons without indication lamp, connected in parallel, only for SCU10-SAE

Catalogue number

Type	Cat. no.
STD400RC/RL-DIN	CCTDD20001
STD400RC/RL-SAE	CCTDD20002
STD1000RL-DIN	CCTDD20003
STD1000RL-SAE	CCTDD20004
SCU10-DIN	CCTDD20011
SCU10-SAE	CCTDD20012

Panel instruments



**kiloWatt
hour meters**



**Power monitoring
units**



Name	AMP / VLT	AMP / VLT	FRE	CH/CI	ME	PM9 / PM9P / PM9C
Function	ammeter, voltmeter	ammeter, voltmeter	frequency meter	hour counter pulse counter	watt-hour meter	Power Meter
Applications Sub-billing and cost allocation						
Energy consumption						
Consumption for different time periods						
Consumption of other utilities						

Installation monitoring

Panel instrumentation	I / U	I / U	F	hours / pulses	E	I, U, F, P, Q, S, PF, E (demand, minimum & maximum values)
Remote monitoring						

Characteristics

Measurement accuracy	class 1.5	$\pm 0.5\% \pm 1$ digit	$\pm 0.5\% \pm 1$ digit		class 2	class 1 (active energy)
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules	DIN rail 2 x 18 mm modules	CI, CH: DIN rail 2 x 18 mm modules	DIN rail 2 or 4 x 18 mm modules	DIN rail 4 x 18 mm modules
Voltage measurement	VLT: 500 V AC direct or external VT	VLT: 600 V AC direct or external VT	400 V AC direct		400 V AC direct	450 V AC direct or external VT
Current measurement	AMP: 30 A direct or external CT	AMP: 10 A direct or external CT			63 A direct or external CT	external CT
Communication ports						1
Inputs / Outputs						1 O

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DIN rail analogue ammeters and voltmeters



AMP.



VLT.

Function

AMP

Ammeters measure the current flowing through an electric circuit in amps.

VLT

Voltmeters measure the potential (voltage) difference of an electric circuit in volts.

Common technical data

- Accuracy: class 1.5.
- Complies with standards IEC 60051 and IEC 60414.
- Ferromagnetic device.
- Pseudo-linear scale over 90°.
- Ammeters (except catalogue number 16029):
 - connection on CT, ratio In/5, to be ordered separately
 - interchangeable dials.
- Temperature:
 - operating temperature: -25°C to +55°C.
 - reference temperature: 23°C.
- Influence of temperature on accuracy: $\pm 0.03\%$ / °C.
- Utilisation frequency: 50/60 Hz.
- Consumption:
 - AMP: 1.1 VA
 - VLT catalogue number 15060: 2.5 VA
 - VLT catalogue number 16061: 3.5 VA.
- Permanent overload:
 - AMP: 1.2 In
 - VLT: 1.2 Un.
- Maximum overload for 5 s:
 - AMP: 10 In
 - VLT: 2 Un
- Connection: tunnel terminals for 1.5 to 6 mm² rigid cables.

Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
AMP with direct connection				
	0-30 A	no	8	16029
AMP with connection on CT				
Basic device (delivered without dial)		X/5	8	16030
Dial	0-5 A			16031
	0-50 A	50/5		16032
	0-75 A	75/5		16033
	0-100 A	100/5		16034
	0-150 A	150/5		16035
	0-200 A	200/5		16036
	0-250 A	250/5		16037
	0-300 A	300/5		16038
	0-400 A	400/5		16039
	0-500 A	500/5		16040
	0-600 A	600/5		16041
	0-800 A	800/5		16042
	0-1000 A	1000/5		16043
	0-1500 A	1500/5		16044
	0-2000 A	2000/5		16045
VLT				
	0-300 V		8	16060
	0-500 V		8	16061



AMP.



VLT.



FRE.

Function

AMP

Ammeters measure in amps the current flowing through an electric circuit.

VLT

Voltmeters measure in volts the potential (voltage) difference of an electric circuit.

FRE

The frequency meter measures in hertz the frequency of an electric circuit from 20 to 600 V AC.

Common technical data

- Supply voltage: 230 V.
- Operating frequency: 50/60 Hz.
- Display by red LED: 3 digits, h = 8 mm.
- Accuracy at full-scale: 0.5 % ±1 digits.
- Consumption: max. 5 VA or rated 2.5 VA.
- Degree of protection:
 - IP40 on front face
 - IP20 at terminal level.
- Connection: tunnel terminals for 2.5 mm² cables.

Specific data

10 A direct reading ammeter

- Minimum value measured: 4 % of rating.
- Measurement input consumption: 1 VA.

Multi-rating ammeter

- Ratings:
 - in direct reading: 5 A
 - by CT (not supplied) configurable on the front face of the ammeter: 10, 15, 20, 25, 40, 50, 60, 100, 150, 200, 250, 400, 500, 600, 800, 1000, 1500, 2000, 2500, 4000, 5000 A.
- Minimum value measured: 4 % of rating.
- Measurement input consumption: 0.55 VA.

Voltmeters

- Direct measurement: 0...600 V.
- Input impedance: 2 MΩ.
- Minimum value measured: 4 % of rating.

Frequency meter

- Minimum value measured: 20 Hz.
- Maximum value measured: 100 Hz.
- Full-scale display: 99.9 Hz.

Compliance with standards

- Safety: IEC/EN 61010-1.
- EMC electromagnetic compatibility: IEC/EN 65081-1 and IEC/EN 65082-2.

Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
Direct reading AMP				
	0-10 A	No	4	15202
Multi-rating AMP				
	0-5000 A	As per rating	4	15209
VLT				
	0-600 V		4	15201
FRE				
	20-100 Hz		4	15208

DIN rail CMA and CMV selector switches



CMA.



CMV.

Function

CMA

This 4-position ammeter selector switch uses a single ammeter (using current transformers) for successive measurement of the currents of a three-phase circuit.

CMV

This 7-position voltmeter selector switch uses a single voltmeter for successive measurement of voltages (phase-to phase and phase-to-neutral) of a three-phase circuit.

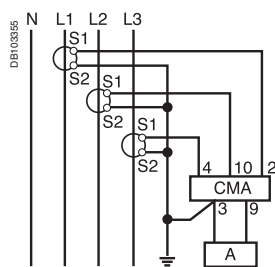
Common technical data

- Rotary handle.
- Maximum operating voltage: 440 V, 50/60 Hz.
- Nominal thermal current: 10 A.
- Operating temperature: -20°C to +55°C.
- Storage temperature: -25°C to +80°C.
- Mechanical durability (AC21A-3x440 V): 2 000 000 operations.
- Degree of protection:
 - IP66 on front face
 - IP20 at terminal level.
- Electrical durability: 1 000 000 operations.
- Connection: jumper terminals with captive screws, for cables up to 1.5 mm².
- Complies with standards: IEC/EN 60947-3.

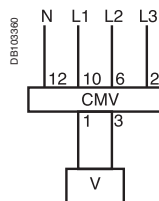
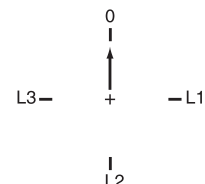
Catalogue numbers

Type	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
CMA	10	415	4	15126
CMV	10	415	4	15125

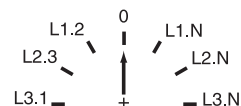
Connection



CMA.



CMV.





CH "DIN".

Function

Electromechanical counter that counts the operating hours of a machine or piece of electrical equipment. Giving a precise indication of operating time, the counter is used to decide when to carry out preventive maintenance.

Common technical data

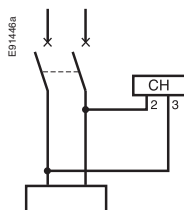
- Electromechanical display.
- Maximum display: 99999.99 hours.
- Display accuracy: 0.01 %.
- Without reset.
- Storage temperature: -25°C to +85°C.
- Connection: tunnel terminals for 2.5 mm² cable.

Specific technical data

CH "DIN"

- Consumption: 0.15 VA.
- Operating temperature: -10°C to +70°C.
- Mounting on DIN rail.

Connection



CH "DIN".

Catalogue numbers

Type	Voltage (V)	Width in mod. of 9 mm	Cat. no.
CH "DIN"	230 V AC/50 Hz	4	15440



Function

Electromechanical counter designed to count impulses emitted by: kilowatt hour meters, temperature overrun detectors, people meters, speed meters, etc.

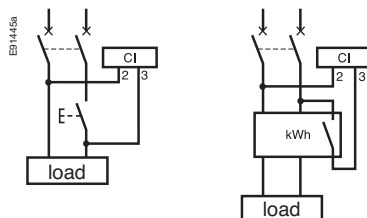
Common technical data

- Supply and metering voltage: 230 V AC, 50/60 Hz.
- Consumption: 0.15 VA.
- Maximum display: 9 999 999 impulses.
- Without reset.
- Metering data:
 - minimum impulse time: 50 ms
 - minimum time between 2 impulses: 50ms.
- Storage temperature: -25°C to +85°C.
- Operating temperature: -10°C to +70°C.
- Connection: tunnel terminals for 2.5 mm² cable.

Catalogue number

Type	Width in mod. of 9 mm	Cat. no.
CI	4	15443

Connection



ME digital watt-hour meters



ME1zr.



ME3zr.

Function

Digital watt-hour meters designed for sub-metering of active energy (rms) consumed by a single-phase or three-phase electric circuit with or without distributed neutral.

ME1

Single-phase watt-hour meter.

ME1z

Single-phase watt-hour meter with partial meter.

ME1zr

Single-phase watt-hour meter with partial meter and remote transfer of metering impulses (relay output).

ME3

Three-phase watt-hour meter without neutral.

ME3zr

Three-phase watt-hour meter without neutral, with partial meter and remote transfer of metering impulses (relay output).

ME4

Three-phase + neutral watt-hour meter.

ME4zr

Three-phase + neutral watt-hour meter with partial meter and remote transfer of metering impulses (relay output).

ME4zrt

Three-phase watt-hour meter with or without neutral associated with external CTs (not supplied), with partial meter and remote transfer of metering impulses (relay output).

Catalogue numbers

Type	Rating (A)	Voltage (V AC)	Tolerance (V AC)	Width in mod. of 9 mm	Cat. no.
Single-phase circuit (1L + N)					
ME1	63	230	± 20 %	4	17065
ME1z	63	230	± 20 %	4	17066
ME1zr	63	230	± 20 %	4	17067
Three-phase circuit (3L)					
ME3	63	3 x 400-3 x 230	± 20 %	8	17075
ME3zr	63	3 x 400-3 x 230	± 20 %	8	17076
ME4zrt	40...6000	3 x 400-3 x 230	± 20 %	8	17072
Three-phase + neutral circuit (3L + N)					
ME4	63	3 x 230/400	± 20 %	8	17070
ME4zr	63	3 x 230/400	± 20 %	8	17071
ME4zrt	40...6000	3 x 230/400	± 20 %	8	17072

Common technical data

Accuracy class	1
Frequency	48/62 Hz
Consumption	2.5 VA
Operating temperature	-25°C to +55°C
Connection by tunnel terminals	Top terminals: 6 mm ² Bottom terminals: 16 mm ²
Compliance with standard	IEC 61557-12: -PMD/DD/K55/1 -PMD/SD/K55/1 (ME4zrt) IEC 62053-21 (accuracy)
Sealable screw shield	Except ME4zrt

Specific technical data

ME1, ME1z and ME1zr specific technical data			
	ME1	ME1z	ME1zr
Direct measurement	Up to 63 A	Up to 63 A	Up to 63 A
Metering and activity indicator light (yellow)	1,000 flashes per kWh	1,000 flashes per kWh	1,000 flashes per kWh
Wiring error indicator	Yes	Yes	Yes
Total meter (max. capacity) on one phase	999.99 MWh	999.99 MWh	999.99 MWh
Total meter display	In kWh or MWh with 5 significant digits	In kWh or MWh with 5 significant digits	In kWh or MWh with 5 significant digits
Partial meter (max. capacity) on one phase with RESET	-	99.99 MWh	99.99 MWh
Partial meter display	-	In kWh or MWh with 4 significant digits	In kWh or MWh with 4 significant digits
Remote transfer	-	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) per kWh
ME3 and ME3zr specific technical data			
	ME3	ME3zr	
Direct measurement	Up to 63 A	Up to 63 A	
Metering and activity indicator light (yellow)	100 flashes per kWh	100 flashes per kWh	
Total meter (max. capacity) on one phase	999.99 MWh	999.99 MWh	
Total meter display	In kWh or MWh with 5 significant digits	In kWh or MWh with 5 significant digits	
Partial meter (max. capacity) on one phase with RESET	-	99.99 MWh	
Partial meter display	-	In kWh or MWh with 4 significant digits	
Remote transfer	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) every 10 kWh	
ME4, ME4zr and ME4zrt specific technical data			
	ME4	ME4zr	ME4zrt
Direct measurement	Up to 63 A	Up to 63 A	-
Measurement by CT	-	-	Ratio of 40/5 to 6,000/5 (configurable)
CT ratings to be adapted to the CTs used	-	-	-
Consumption of each measurement input	-	-	0.05 VA to 5 A
Metering and activity indicator light (yellow)	100 flashes per kWh	100 flashes per kWh	10,000/x flashes per kWh (1) (x = CT rating)
Total meter (max. capacity) on all 3 Phases	999.99 MWh	999.99 MWh	Where CT ≤ 150 A : 999.99 MWh Where CT > 150 A : 9,999.99 MWh
Total meter display	In kWh or MWh with 5 significant digits	In kWh or MWh with 5 significant digits	In kWh or MWh with 5 significant digits
Partial meter (max. capacity) on all 3 phases with RESET	-	99.99 MWh	Where CT ≤ 150 A : 99.99 MWh Where CT > 150 A : 999.99 MWh
Partial meter display	-	In kWh or MWh with 4 significant digits	In kWh or MWh with 4 significant digits
Remote transfer	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) every 10 kWh	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 10/x impulse of 200 ms (contact closing) per kWh = x/10 kWh per impulse (2) (x = CT rating)

(1) example: 500/5 CT = 10,000/500 flashes per kWh = 20 flashes per kWh

(2) example: 500/5 CT = 500/10 kWh per impulse = 50 kWh per impulse

Power meter series PM9

Functions and characteristics



Power Meter Series PM9.

The PowerLogic Power Meter Series PM9 offers the basic measurement capabilities required to monitor an electrical installation in a 4-module case (18 mm modules).

They can be used to monitor 2-, 3- and 4-wire low-voltage systems and connect to external current transformers. With the large backlit display, you can monitor all three phases at the same time.

Three versions are available with supply voltage 220 to 240 V AC:

- PM9 for basic measurements
- PM9P for basic measurements with pulse output
- PM9C for basic measurements with Modbus RS485 output.

Applications

Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.

Characteristics

Only 72 mm wide (four 18 mm modules)

Compact design for optimised installation.

Large backlit display

Simultaneous monitoring of all three phases.

Demand power

Monitoring of subscribed-power overruns.

IEC 62053-21 Class 1 for energy

For sub-billing and cost-allocation applications.

Part numbers

Type	Voltage	Width in 9 mm modules	Part no.
Power Meter PM9	220 to 240 V AC	8	15199
Power Meter PM9P	220 to 240 V AC	8	15197
Power Meter PM9C	220 to 240 V AC	8	15198

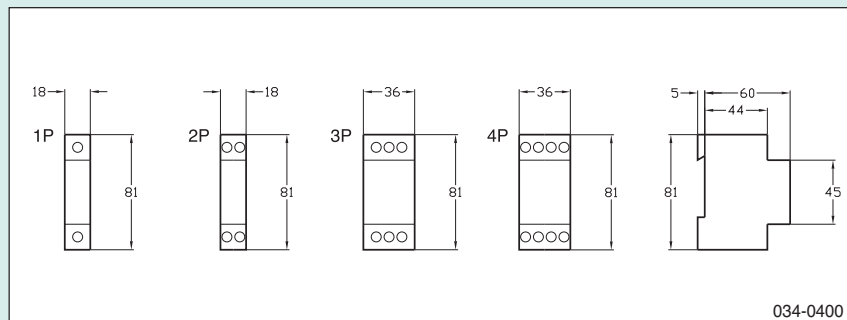
Selection guide		PM9	PM9P	PM9C
General				
Use on LV systems only	1P + N, 3P, 3P + N	■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Energy and power accuracy		1 %	1 %	1 %
Direct voltage connection		450 V	450 V	450 V
Instantaneous rms values				
Current	3 phases and neutral	■	■	■
Voltage	Phase-to-neutral and phase-to-phase	■	■	■
Frequency		■	■	■
Active and reactive power	Total and per phase	■	■	■
Apparent power	Total	■	■	■
Power factor	Total	■	■	■
Energy values				
Active energy		■	■	■
Partial active energy		■	■	■
Reactive energy		■	■	■
Demand values				
Active, reactive, apparent power	Present and max. values	■	■	■
Other measurements				
Hour counter		■	■	■
Display and I/O				
Backlit LCD display		■	■	■
Pulse output		-	1	-
Communication				
RS485 port		-	-	■
Modbus protocol		-	-	■

Electrical characteristics		
Type of measurement		On single-phase (1P + N) or three-phase (3P, 3P + N) AC systems
Measurement accuracy	Current and voltage	0.5 % of reading
	Power	1 % of reading from pf 0.8 leading to 0.5 lagging
	Frequency	0.2 Hz
	Power factor	2 % from 0.8 leading to 0.5 lagging
	Active energy	Class 1 as defined by IEC 62053-21
	Reactive energy	Class 2 as defined by IEC 62053-23
Input-voltage characteristics	Measured voltage	50 to 450 V AC (direct) and up to 1000 V AC (with external VT)
	Permissible overload	1.15 Un
	Frequency measurement range	45 to 65 Hz
Input-current characteristics	CT ratings	Adjustable from 5 to 10000 A
	Secondary	5 A
	Metering over-range	15 mA to 6 A
	Permissible over-load	6 A continuous 20 A 10 s 50 A 1 s
	Load	0.55 VA
	Input current	Not isolated
Control Power	AC	220 to 240 V AC ($\pm 10\%$), < 5 VA
Pulse output (PM9P)		Static output, 350 V AC/DC max., 130 mA max. at 25 °C, derating 1 mA/°C above 25 °C, 5 kV insulation
Mechanical characteristics		
Weight		0.3 kg
IP degree of protection		IP52 (front display)
Dimensions		72 x 90 x 66 (mm)
Connection		Tunnel terminals, 1 x 4 mm ²
Environmental conditions		
Operating temperature		-5 °C to +55 °C
Pollution degree		2
Installation category		III for distribution systems up to 260/450 V
Electromagnetic compatibility	Electrostatic discharge	Level III (IEC 61000-4-2)
	Immunity to radiated fields	Level III (IEC 61000-4-3)
	Immunity to fast transients	Level IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
	Conducted and radiated emissions	Class B (CISPR11)
Safety		
		CE
Communication		
RS485 port (PM9C) remote reading and reset		2-wire, 9600 or 19200 bauds, Modbus RTU, ELSV circuit, 6 kV impulse withstand (double insulation)

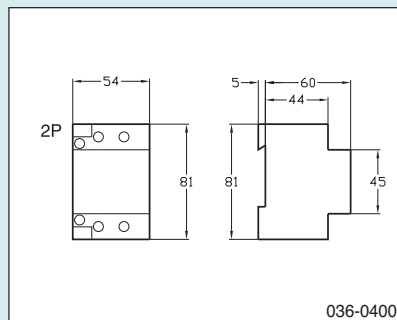
Dimensions of modular switchgear Control

CT contactors

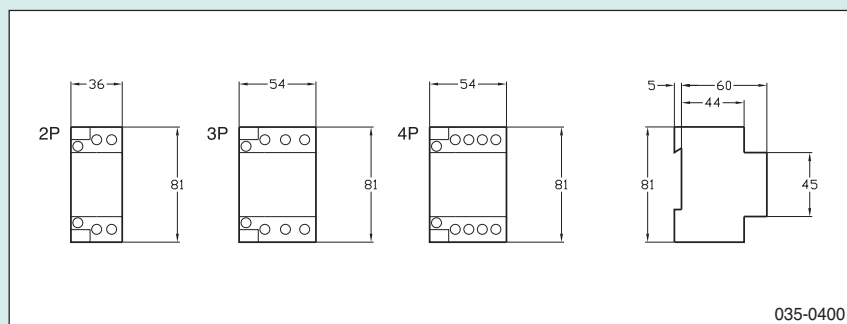
standard contactors 16/25 A



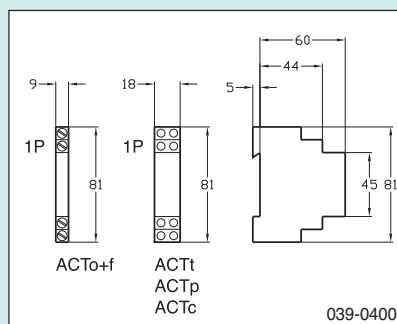
standard contactors 100 A



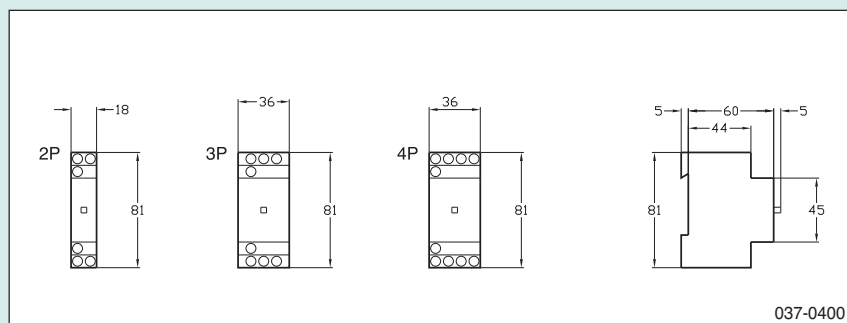
standard contactors 40/63 A



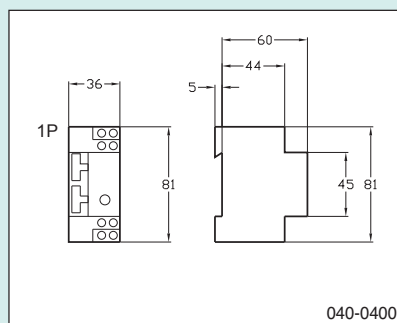
add-on auxiliaries
ACTo+f, ACTt, ACTp, ACTc



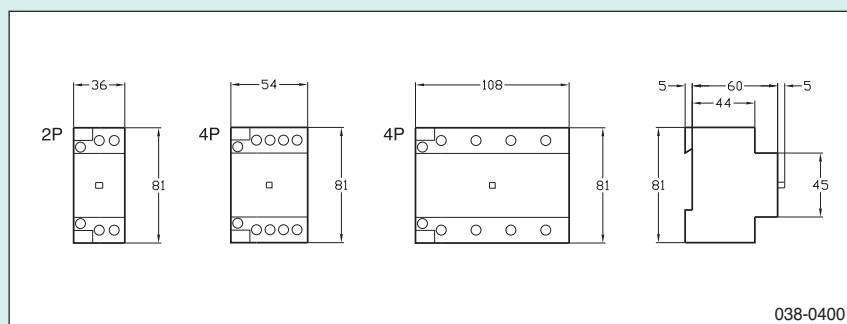
contactors with manual operating mechanism 40/63 A



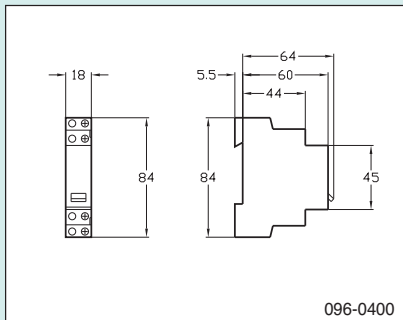
add-on auxiliaries ATB1S



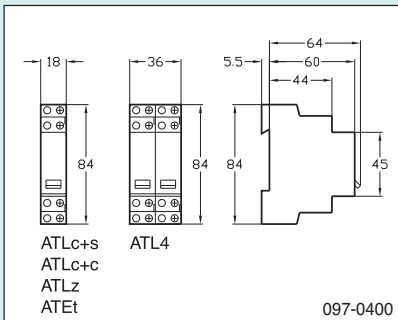
contactors with manual operating mechanism 40/63 A



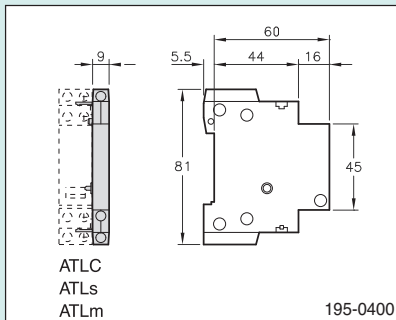
impulse relays TL and ETL extension



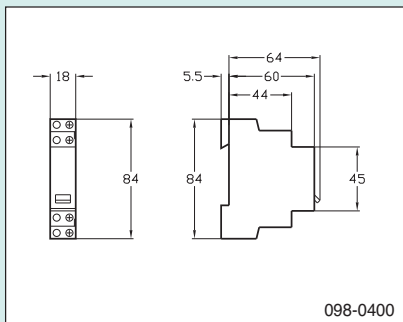
add-on auxiliaries ATLc+s, ATLc+c, ATLz, ATet, ATL4



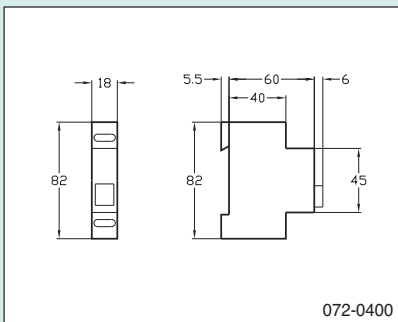
9 mm type auxiliaries ATLC, ATLS, ATLM



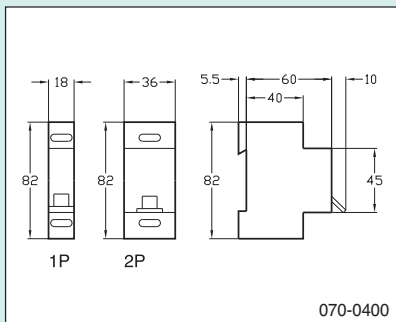
TLc, TLM and TLS impulse relays with built-in auxiliary function



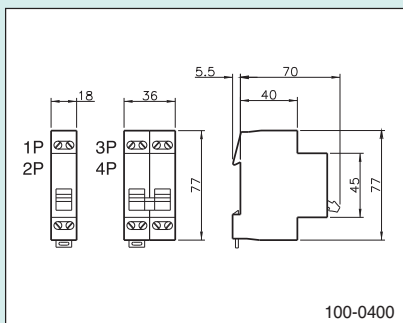
BP pushbuttons



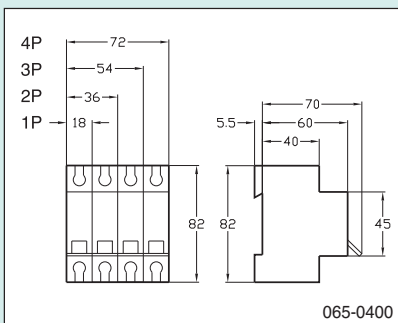
CM selector switches



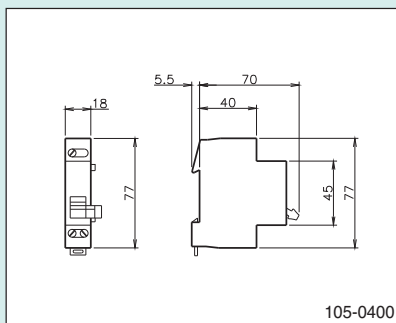
I switch-disconnectors 20 and 32 A



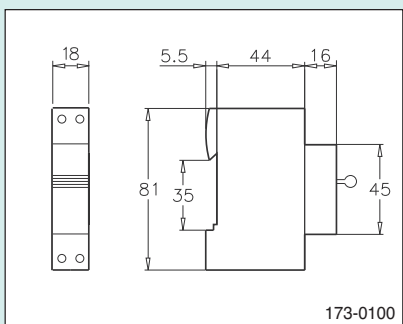
40 to 125 A



NO, NF (auxiliaries)

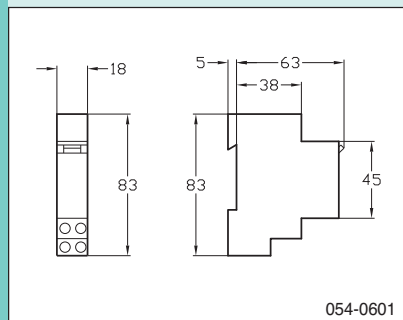


fuses STI

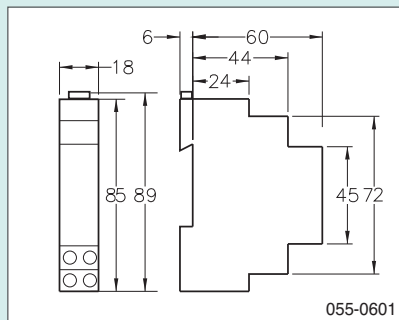


Dimensions of modular switchgear Control

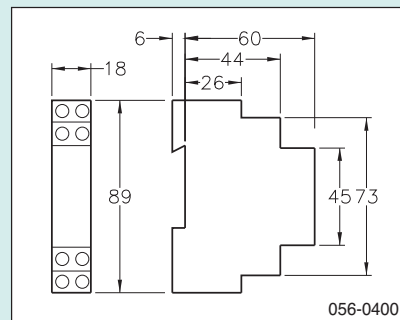
timer and switch-off warning MIN timer



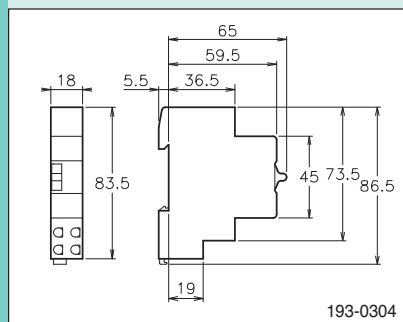
MINs, MINp and MINT timers



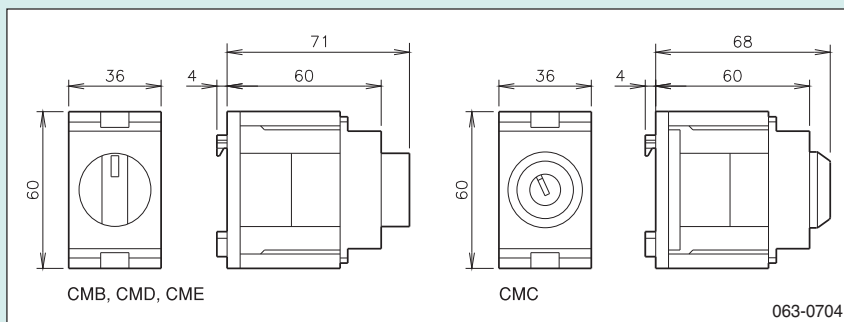
PRE switch-off warning



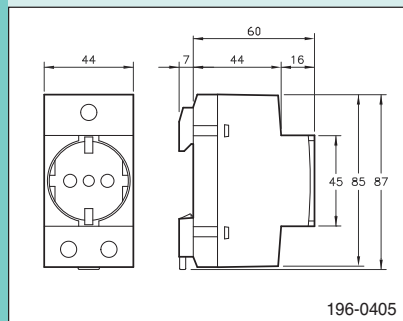
MIN 3-3 and MIN 3-4 timers



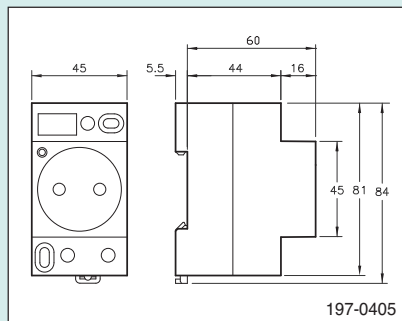
selector switches CMB, CMC, CMD and CME



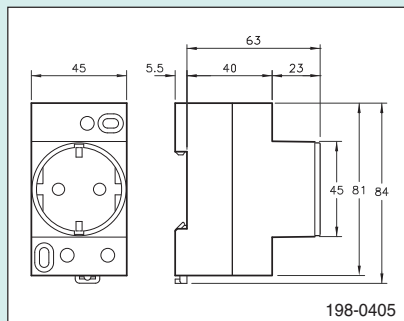
current plug 16 and 20 A PC 16 A italian standard



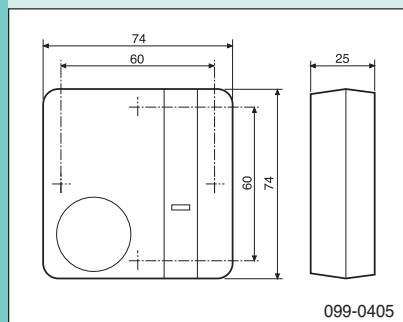
PC 16 A NF



PC 16 A german standard

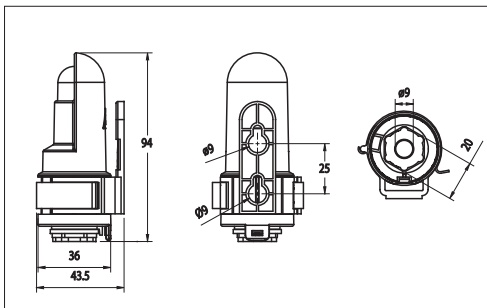
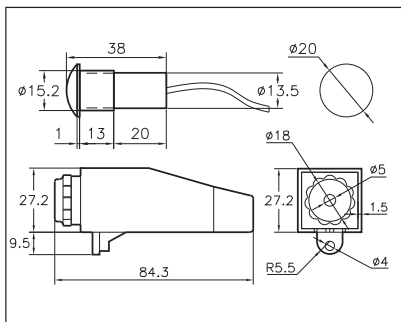


PC 20 A

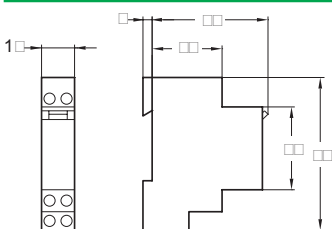


Dimensions of modular switchgear

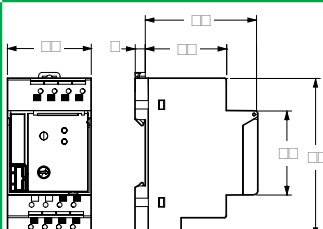
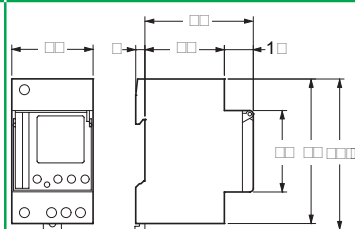
Switchboard cell and wall-mounted cell
Cat.n0.15268



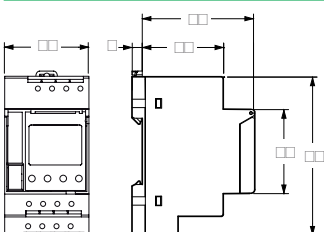
IC 100



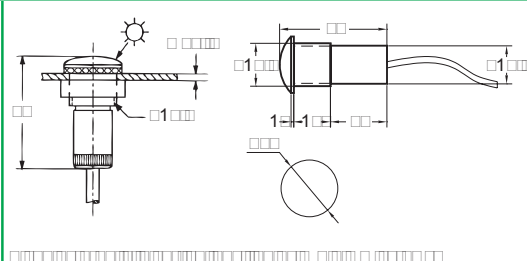
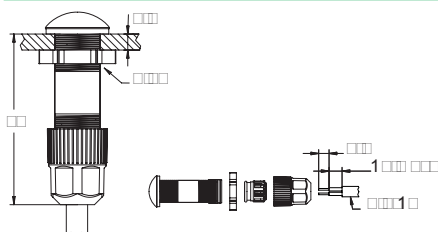
IC 2000

**IC 2000P+**

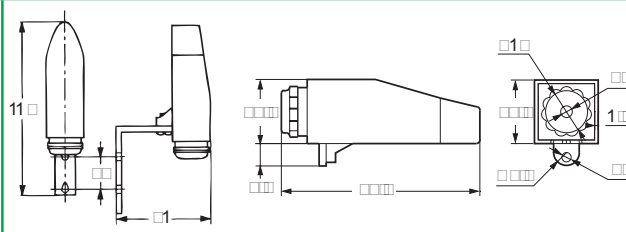
IC Astro 1C/2C



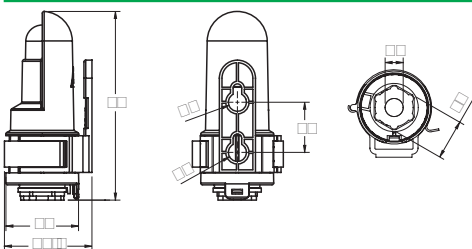
Standard switchboard cell 1 1 1 1 1

Digital switchboard cell 

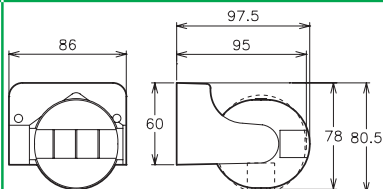
Wall-mounted cell
(delivered with IC 100, IC 2000P+)



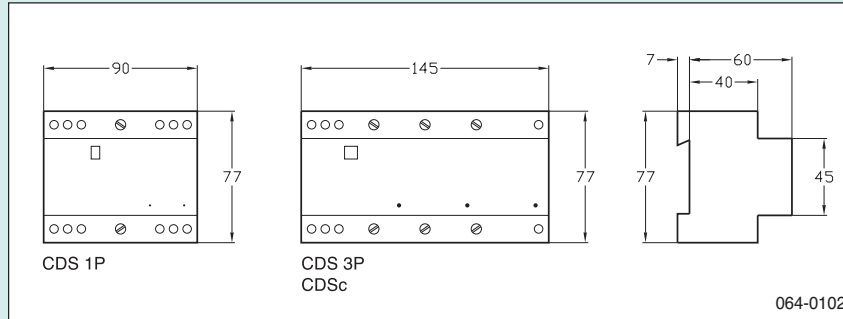
Standard wall-mounted cell



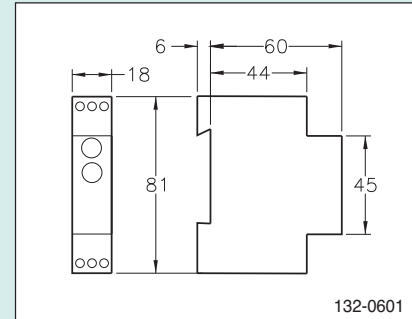
Movement detection control switches CDM 180



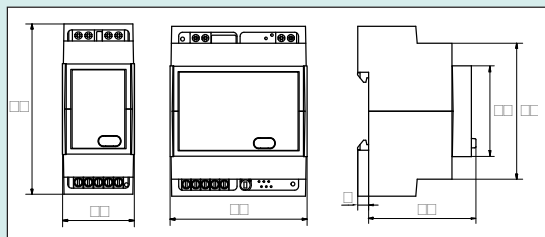
CDS and CDS_c load-shedding contactors



RT ... time delay relays

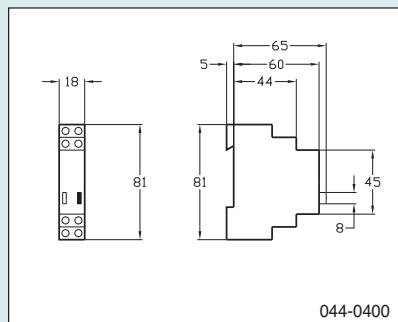


STD- SCU dimmers

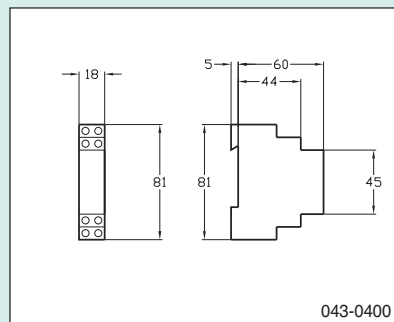


RLI, RBN and RTBT relays

RLI changeover relay + ERL extension

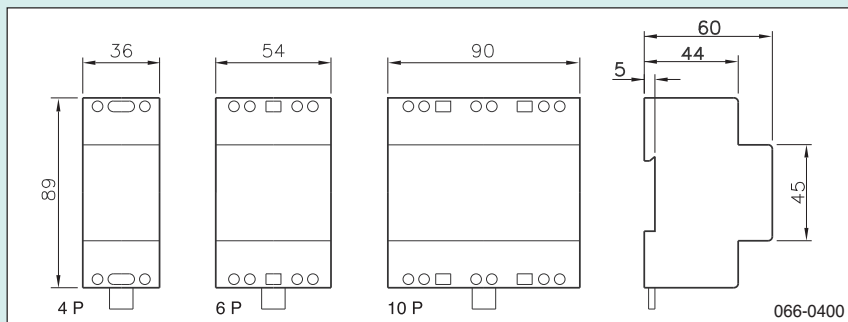


RBN, RTBT relays

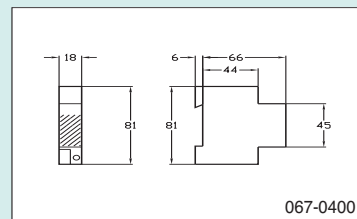


Dimensions of modular switchgear Monitor

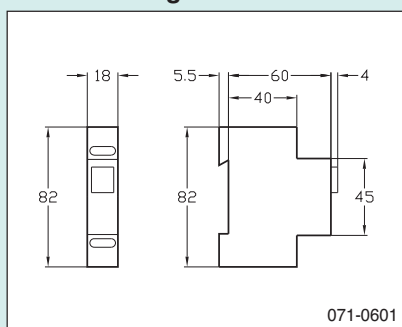
TR bell and safety transformers



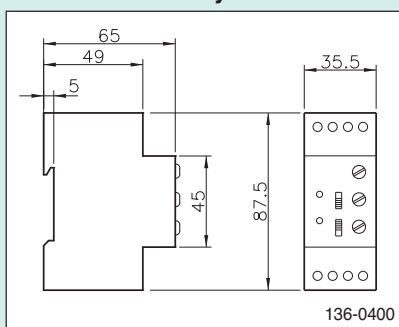
SO bell and RO buzzer



V indicator lights

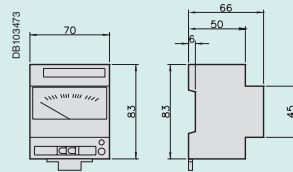


RC... control relays

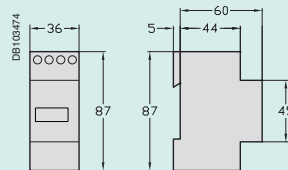


Dimensions of power measurement and monitoring

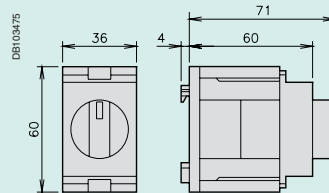
Analogue ammeters and voltmeters



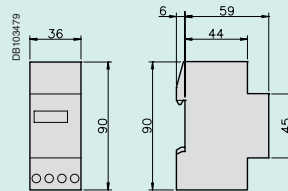
Digital ammeters, voltmeter and frequency meter



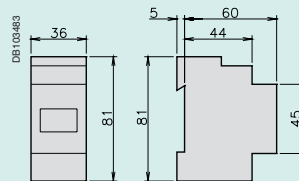
CMA and CMV selector switches



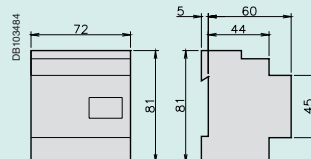
CI impulse counter and CH hour counter



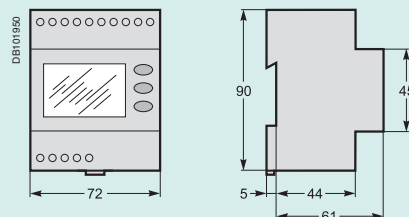
ME1, ME1z and ME1zr watt-hour meters



ME3, ME3zr, ME4, ME4zr, ME4zrt watt-hour meters



Power Meters PM9/PM9P/PM9C





Modular Enclosures

E Modular Enclosures

Chapter I

Pragma mini-enclosures

I.1 - Micro Pragma Surface mounting	E 2
I.3 - Mini Pragma Surface mounting	E 3
I.2 - Mini Pragma Flush mounting	E 6
I.4 - Accessories for Mini Pragma	E 11
I.5 - Mini Pragma L Flush mounting	E 14
I.6 - Mini Pragma L Surface mounting	E 15

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Pragma enclosures

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II.2 - Pragma Surface mounted enclosures	E 18
II.3 - Pragma Flush mounted enclosures	E 20
II.4 - Pragma Accessories	E 22

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III.2 - Kaedra offer overview	E 31
III.3 - Kaedra choice table	E 33
III.4 - Kaedra enclosures and mini enclosures for modular switchgear	E 34
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Labeling - Marking

IV.1 - Multi 9 Printer	E 48
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Chapter V

Dimensions

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V.2 - Pragma	E 53
V.3 - Kaedra	E 60

PB100412



10205

PB100413



10206

Function

The Micro Pragma is a multi-function enclosure.

It is used indoors, in housing and in commercial building sector, for new and renovated installations.

Description

Technical data

- Material:
 - Self-extinguishing insulating material
 - Fire and abnormal heat withstand: 650°C / 30s as per IEC 60695-2-1
 - colour: white Ral 9003
- Compliance with standards:
 - complies with IEC 60439-3 (EN 60-439-3)
 - IMQ approved as per italian standard IEC 23-48.
- Degree of protection:
 - as per IEC 60529: IP 40 (protection against solids and liquids penetration)
 - as per EN 50-102: IK 07 (protection against mechanical impacts).

Composition

The Micro Pragma is made up of:

- A back including a symmetrical DIN rail
- Pre-punchouts on the 4 sides
- A sealable reversible cover equipped with built-in blanking plates.

Catalogue numbers

Numbers of rows	Capacity		Dimensions (mm)			Cat. no.
	in modules of 9 mm	modules of 18 mm	H	W	D	
1	4	2	130	51	60	10205
1	8	4	130	88	60	10206
1	12	6	165	140	72	10207
1	16	8	200	198	72	10208

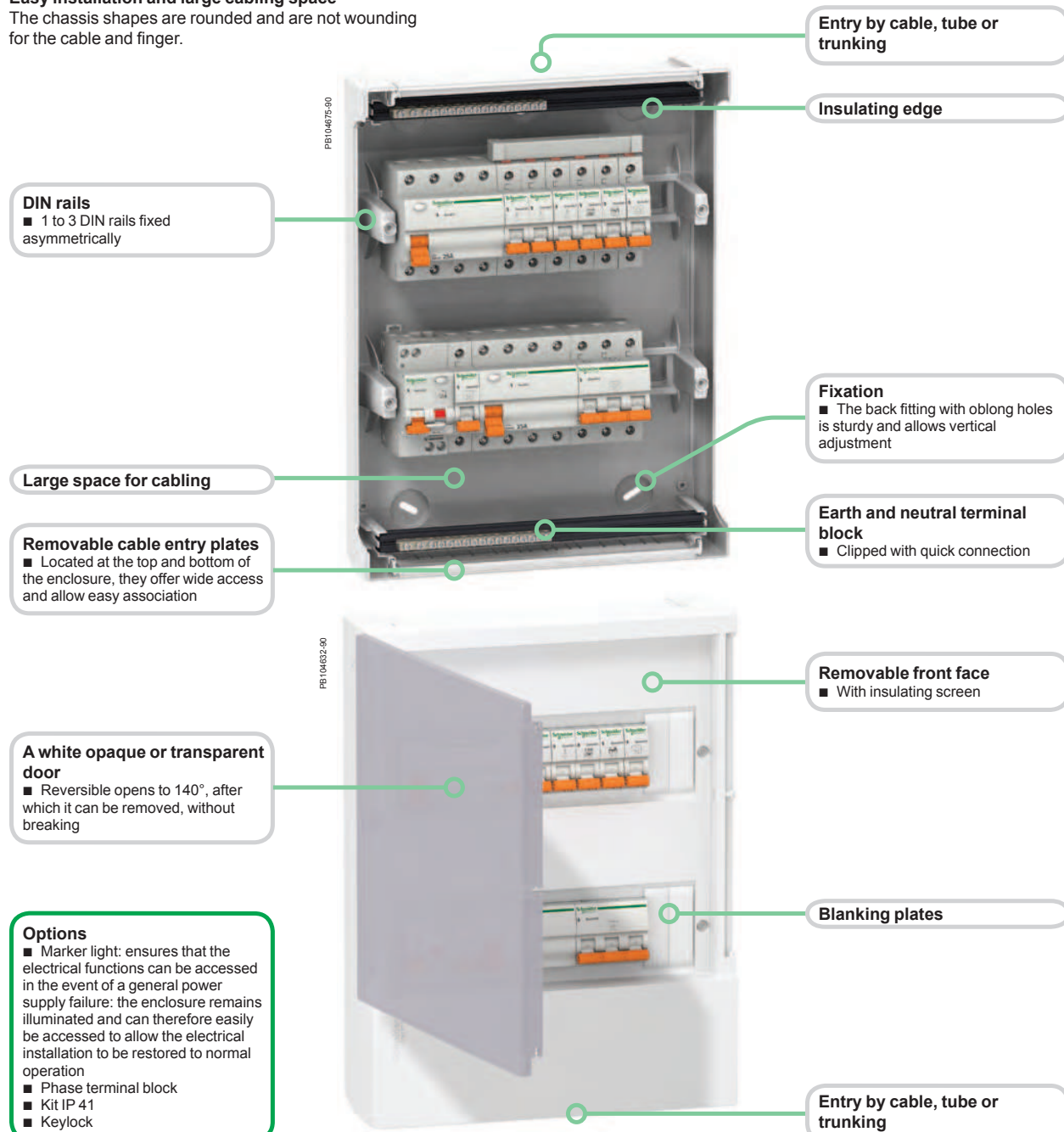
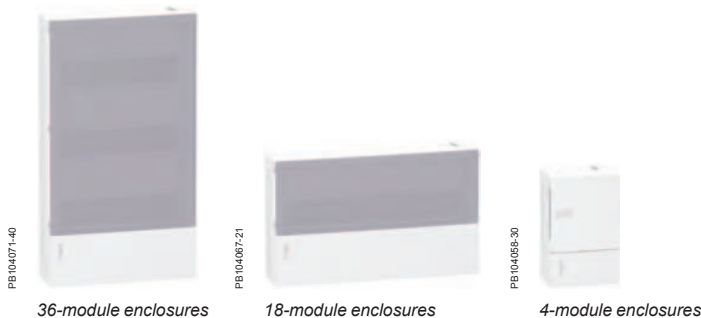
Mini Pragma is a robust modular enclosure (IK 07), aesthetic with innovative design; it is highly suitable for a living environment integration. It offers great security (IP 40, IP 41, with accessory) thanks to the front face with a white opaque or transparent door models on all models.

The surface mounting enclosures

The range consists of enclosures with a width of 4, 6, 8, 12, 18, 24 or 36- module of 18 mm, of 1, 2 or 3-row ready-to-use; designed for electricians: ergonomic design and flexibility of installation.

Easy installation and large cabling space

The chassis shapes are rounded and are not wounding for the cable and finger.





A range of 18 mm, 1, 2 or 3-row 4, 6, 8, 12, 18, 24 or 36-module ready-to-use enclosures designed for electricians: ergonomic design and flexibility of installation.

Function

This distribution or sub-distribution enclosure, up to 63 A, is designed for installing electrical switchboards in new or renovated installations in the housing sector.

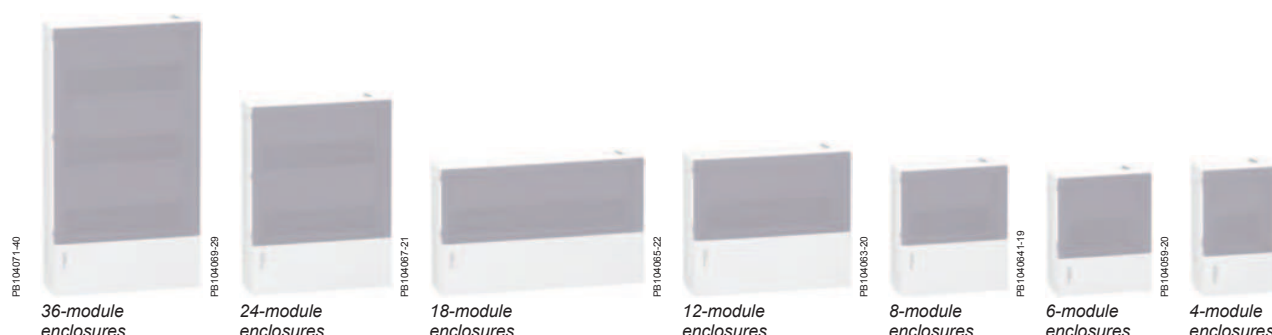
Description

The surface mounting Mini Pragma consists of:

- a back with:
 - a centered slot to facilitate installation
 - fixing holes for vertical adjustment.
- the necessitate for entry cables:
 - two removable cable entry plates at the top and bottom
 - punch-outs
 - a large area for drilling (crown saw, punches)
- 1 to 3 DIN rails fixed asymmetrically onto the back
- a reversible front face, fitted with pre-cutout blanking plates
- a white opaque or transparent door.
- an earth terminal block and a neutral terminal block

Enclosure colour: White RAL 9003.

This enclosure can be equipped with a marker light, available in accessories. It allows locating the enclosure in the dark during a power failure.



Smoked transparent door.



White door.

Technical data

Enclosures		
Compliance with standards		IEC 60439-3, IEC 60529, IEC 60695-2-11, EN 50102, IEC 60670-24
Rated current (In)	4-module enclosure	50 A
	6 to 36-module enclosures	63 A
Rated insulation voltage (Ui)		< 400 V
Insulation		Class 2 (to IEC 60439-3)
Degree of protection	To IEC 60529	IP 40
	Against mechanical impacts	IK 07
Materials		Self-extinguishing technoplastic (1): resistant to fire and abnormal heat 650°C to IEC 60695-2-11

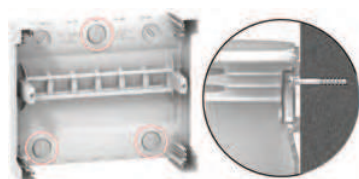
(1) Technoplastic material specially developed by Schneider Electric.

PB104059-35



MIP12104T

PB104650-30



Insulating plug

PB104657-37



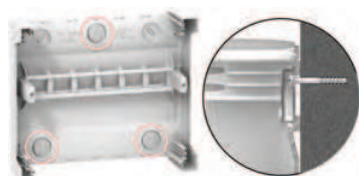
MIP99030

PB104059-35



MIP10104T

PB104650-30



Insulating plug

Catalogue numbers offer: with earth + neutral terminal block

White enclosures				Cat. no.	
Number of rows	Number of modules per row	Capacity in 18 mm modules	Rated current In (A)	With solid white door	With smoked transparent door
1	4	4	50	MIP12104	MIP12104T
	6	6	63	MIP12106	MIP12106T
	8	8	63	MIP12108	MIP12108T
	12	12	63	MIP12112	MIP12112T
	18	18	63	MIP12118	MIP12118T
2	12	24	63	MIP12212	MIP12212T
3	12	36	63	MIP12312	MIP12312T

Components delivered with each enclosure

Type	
Insulating plug (pack of 4)	To be placed over the back fixing screws to obtain class 2 insulation
Identification strip for each row	To be glued onto the front panel
Two terminal block supports	
Two earth/neutral terminal blocks	Supplied with the 4 or 6-module enclosure 2 x (1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□])
	Supplied with the 8 or 12-module enclosure 2 x (1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□])
	Supplied with the 18 or 24-module enclosure 2 x (2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□])
	Supplied with the 36-module enclosure 2 x (2 x 16 [□] + 9 x 10 [□] + 9 x 6 [□])
Blanking plates (packs of 10)	Clipped on the front face

Catalogue numbers offer: without earth + neutral terminal block

White enclosures				Cat. no.	
Number of rows	Number of modules per row	Capacity in 18 mm modules	Rated current In (A)	With solid white door	With smoked transparent door
1	4	4	50	MIP10104	MIP10104T
	6	6	63	MIP10106	MIP10106T
	8	8	63	MIP10108	MIP10108T
	12	12	63	MIP10112	MIP10112T
	18	18	63	MIP10118	MIP10118T
2	12	24	63	MIP10212	MIP10212T
3	12	36	63	MIP10312	MIP10312T

Components delivered with each enclosure

Type	
Insulating plug (pack of 4)	To be placed over the back fixing screws to obtain class 2 insulation
Identification strip for each row	To be glued onto the front panel
Blanking plates (packs of 10)	Clipped on the front face

Modular Enclosures

Pragma mini-enclosures

Mini Pragma

Flush mounting enclosures

Offer: with earth + neutral terminal block



Mini Pragma is a robust modular enclosure (IK 07), aesthetic with innovative design; it is highly suitable for a living environment integration. It offers great security (IP 40, IP 41, with accessory) thanks to the front face with a white opaque or transparent door models on all models.

The flush mounting enclosures

The range consists of enclosures with a width of 4, 6, 8, 12, 18, 24 or 36- module of 18 mm, of 1, 2 or 3-row ready-to-use; designed for electricians: ergonomic design and flexibility of installation.

Easy installation and large cabling space

The chassis shapes are rounded and are not wounding for the cable and finger.



36-module enclosures



18-module enclosures



4-module enclosures

Base

- With pre-holes on the 4 sides for entry tubes
- Clamping leg for hollow partition
- Carton protection for installation in masonry

Entry by cable, tube or trunking

Removable chassis

- For table-top installation, as well as the possibility of adjustment for correct horizontal and vertical positioning (flush-mounted version)

Large space for cabling

Earth and neutral terminal block

- Clipped with quick connection

A white opaque or transparent door

- Reversible opens to 140°, after which it can be removed, without breaking

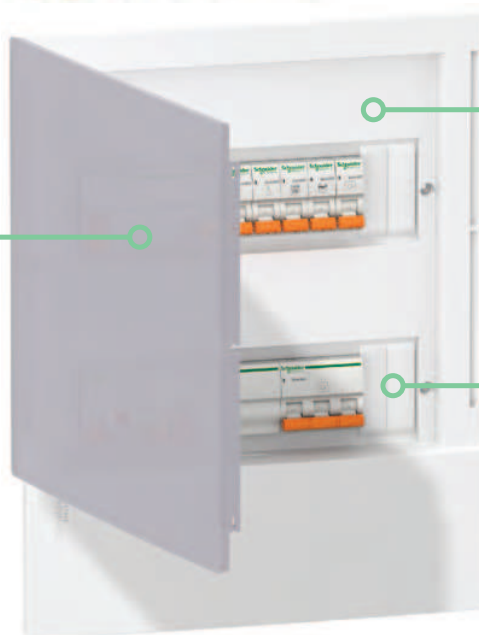
Removable front face

- With insulating screen
- 5 colours available:
 - ☐ white
 - ☐ ivory
 - ☐ garnet red
 - ☐ pistachio green
 - ☐ misty grey

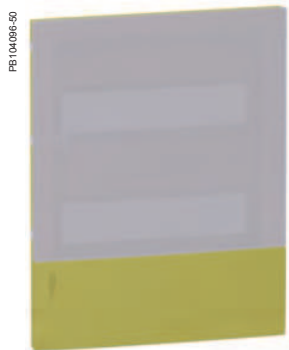
Options

- Marker light: ensures that the electrical functions can be accessed in the event of a general power supply failure: the enclosure remains illuminated and can therefore easily be accessed to allow the electrical installation to be restored to normal operation
- Phase terminal block
- Kit IP 41
- Keylock

Blanking plates



A range of 18 mm, 1, 2 or 3-row 4, 6, 8, 12, 18, 24 or 36-module ready-to-use enclosures designed for electricians: ergonomic design and flexibility of installation.



PB104066-50

Function

This distribution or sub-distribution enclosure, up to 63 A, is designed for installing electrical switchboards in new or renovated installations in the housing sector.

Description

Two choices are possible:

Offer to compose

This offer can compose the enclosures according to their own preference, based on a choice of 5 colours of different front face and a large number of accessories.

OR

Offer composed

This offer allows having for a single reference a complete enclosure equipped with:

- a symmetrical back box
- robust
- depth adapted to the walls of reduced thickness
- with pre-holes for entry tubes on the 4 sides
- 1 to 3 rails DIN, chassis allows the cabling outside the back box
- a rigid and reversible white (RAL 9003) front face, fitted with pre-cutout blanking plates with white opaque or transparent door
- an earth and neutral terminal block

This enclosure can be equipped with a marker light, available in accessories. It allows locating the enclosure in the dark during a power failure.



PB104065-40

36-module enclosures



PB104063-28

24-module enclosures



PB104061-21

18-module enclosures



PB104079-22

12-module enclosures



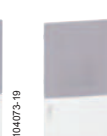
PB104077-20

8-module enclosures



PB104071-40

6-module enclosures



PB104073-19

4-module enclosures



PB104108-20

Smoked transparent door.



PB104107-20

White door.

Technical data

Enclosures		
Compliance with standards		IEC 60439-3, IEC 60529, IEC 60695-2-11, EN 50102, IEC 60670-24
Rated current (In)	4-module enclosure	50 A
	6 to 36-module enclosures	63 A
Rated insulation voltage (Ui)		< 400 V
Insulation		Class 2 (to IEC 60439-3)
Degree of protection	To IEC 60529	IP 40
	Against mechanical impacts	IK 07
Materials		Self-extinguishing technoplastic (1): resistant to fire and abnormal heat 650°C to IEC 60695-2-11

(1) Technoplastic material specially developed by Schneider Electric.

Mini Pragma

Flush mounting enclosures

Offer: with earth + neutral terminal block



PB104087-35



MIP30104T

PB104088-35



MIP40104T

PB104089-35



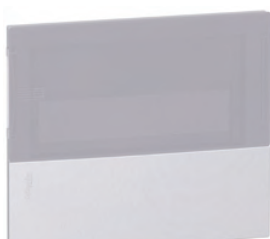
MIP50104T

PB104090-35



MIP60104T

PB104091-35



MIP70104T

Offer to compose

Front face*			Cat. no.		+ Base
Number of rows	Number of modules per row	Capacity in 18 mm modules	With solid white door	With smoked transparent door	With earth + neutral terminal block
White					
1	4	4	MIP30104	MIP30104T	MIP82104
	6	6	MIP30106	MIP30106T	MIP82106
	8	8	MIP30108	MIP30108T	MIP82108
	12	12	MIP30112	MIP30112T	MIP82112
	18	18	MIP30118	MIP30118T	MIP82118
2	12	24	MIP30212	MIP30212T	MIP82212
3	12	36	MIP30312	MIP30312T	MIP82312
Ivory					
1	4	4	-	MIP40104T	MIP82104
	6	6	-	MIP40106T	MIP82106
	8	8	-	MIP40108T	MIP82108
	12	12	-	MIP40112T	MIP82112
	18	18	-	MIP40118T	MIP82118
2	12	24	-	MIP40212T	MIP82212
3	12	36	-	MIP40312T	MIP82312
Garnet red					
1	4	4	-	MIP50104T	MIP82104
	6	6	-	MIP50106T	MIP82106
	8	8	-	MIP50108T	MIP82108
	12	12	-	MIP50112T	MIP82112
	18	18	-	MIP50118T	MIP82118
2	12	24	-	MIP50212T	MIP82212
3	12	36	-	MIP50312T	MIP82312
Pistachio green					
1	4	4	-	MIP60104T	MIP82104
	6	6	-	MIP60106T	MIP82106
	8	8	-	MIP60108T	MIP82108
	12	12	-	MIP60112T	MIP82112
	18	18	-	MIP60118T	MIP82118
2	12	24	-	MIP60212T	MIP82212
3	12	36	-	MIP60312T	MIP82312
Misty grey					
1	4	4	-	MIP70104T	MIP82104
	6	6	-	MIP70106T	MIP82106
	8	8	-	MIP70108T	MIP82108
	12	12	-	MIP70112T	MIP82112
	18	18	-	MIP70118T	MIP82118
2	12	24	-	MIP70212T	MIP82212
3	12	36	-	MIP70312T	MIP82312

(*) Chassis and DIN rails delivered with the front face.

N.B.: Each part of the above references can be ordered separately

PB104073-36



MIP22104T

Composed offer is for white
color enclosures only

PB104073-36



MIP20104T

Offer composed with earth + neutral terminal block

White enclosures				Cat. no.	
Number of rows	Number of modules per row	Capacity in 18 mm modules	Rated current In (A)	With solid white door	With smoked transparent door
1	4	4	50	MIP22104	MIP22104T
	6	6	63	MIP22106	MIP22106T
	8	8	63	MIP22108	MIP12108T
	12	12	63	MIP22112	MIP22112T
	18	18	63	MIP22118	MIP22118T
2	12	24	63	MIP22212	MIP22212T
3	12	36	63	MIP22312	MIP22312T

Components delivered with each enclosure

Type	
Identification strip for each row	To be glued onto the front panel
Two terminal block supports	
Two earth/neutral terminal blocks	Supplied with the 4 or 6-module enclosure 2 x (1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□])
	Supplied with the 8 or 12-module enclosure 2 x (1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□])
	Supplied with the 18 or 24-module enclosure 2 x (2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□])
	Supplied with the 36-module enclosure 2 x (2 x 16 [□] + 9 x 10 [□] + 9 x 6 [□])
Blanking plates (packs of 10)	Clipped on the front face

Offer composed without earth + neutral terminal block

White enclosures				Cat. no.	
Number of rows	Number of modules per row	Capacity in 18 mm modules	Rated current In (A)	Solid white door	Smoked transparent door
1	4	4	50	MIP20104	MIP20104T
	6	6	63	MIP20106	MIP20106T
	8	8	63	MIP20108	MIP20108T
	12	12	63	MIP20112	MIP20112T
	18	18	63	MIP20118	MIP20118T
2	12	24	63	MIP20212	MIP20212T
3	12	36	63	MIP20312	MIP20312T

Components delivered with each enclosure

Type	
Identification strip for each row	To be glued onto the front panel
Blanking plates (packs of 10)	Clipped on the front face

Accessories for flush mounting enclosures

Installation accessories		Cat. no.
Type	Description	
IP41 kit 	White sealing kit	MIP99035
Hollow partition flush mounting kit 	Used to secure the base of the enclosure to be flush-mounted in a hollow partition.	MIP99047

PB104114-07



PB104127-20



Mini Pragma

Flush mounting enclosures

Offer: with earth + neutral terminal block



PB104104-35



MIP80104

PB104130-35



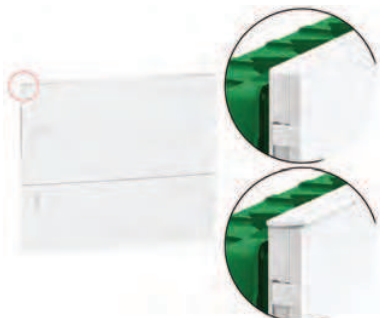
MIP81112

PB104131-35



MIP82112

PB104638-45



MIP99035

Accessories (continued)

Base only			Cat. no.
Number of rows	Number of modules per row	Capacity in 18 mm modules	
1	4	4	MIP80104
	6	6	MIP80106
	8	8	MIP80108
	12	12	MIP80112
	18	18	MIP80118
2	12	24	MIP80212
3	12	36	MIP80312

Base with earth terminal block			Cat. no.
Number of rows	Number of modules per row	Type of terminal block	
1	4	1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□]	MIP81104
	6	1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□]	MIP81106
	8	1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□]	MIP81108
	12	1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□]	MIP81112
	18	2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□]	MIP81118
2	12	2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□]	MIP81212
3	12	2 x 16 [□] + 9 x 10 [□] + 9 x 6 [□]	MIP81312

Base with earth/neutral terminal blocks			Cat. no.
Number of rows	Number of modules per row	Type of terminal block	
1	4	2 x (1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□])	MIP82104
	6	2 x (1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□])	MIP82106
	8	2 x (1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□])	MIP82108
	12	2 x (1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□])	MIP82112
	18	2 x (2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□])	MIP82118
2	12	2 x (2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□])	MIP82212
3	12	2 x (2 x 16 [□] + 9 x 10 [□] + 9 x 6 [□])	MIP82312

Other accessories

Type		Cat. no.
Flush mounting IP41 kit		MIP99035
Terminal block support (pack of 2)	18 modules	MIP99036
Terminal block	1 x 16 [□] + 2 x 10 [□] + 1 x 6 [□]	MIP99037
	1 x 16 [□] + 4 x 10 [□] + 3 x 6 [□]	MIP99038
	2 x 16 [□] + 8 x 10 [□] + 6 x 6 [□]	MIP99039
	2 x 16 [□] + 9 x 10 [□] + 9 x 6 [□]	MIP99040
Earth terminal block	3 x 16 [□] + 12 x 2.5 [□]	13409
	4 x 16 [□] + 20 x 2.5 [□]	13410
Ph+N insulated terminal block (pack of 2)	2 x (1 x 35 [□] + 5 x 16 [□])	13411
	2 x (1 x 35 [□] + 7 x 16 [□])	13412
Blanking plate	5 modules	13387
Symbol plate	Standard	13735
	Special	13736
Keylock		MIP99046
Hollow partition flush mounting kit		MIP99047
Marker light		MIP99050

Accessories for surface mounting enclosures

Installation accessories		Cat. no.
	Kit IP41	MIP99034
	White sealing kit	

PB104114-07

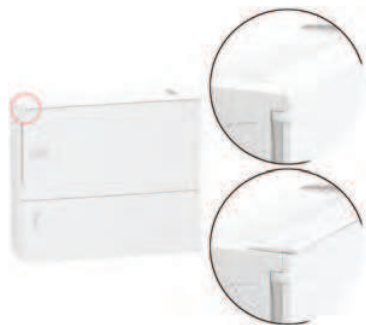
Finishing accessories		Cat. no.
Type	Description	Solid white
	4 modules	MIP99029
	6 modules	MIP99030
	8 modules	MIP99031
	12 modules	MIP99032
	18 modules	MIP99033

PB104115-20

Accessories

Type		Cat. no.
Removable plate (pack of 2)	4 modules	MIP99029
	6 modules	MIP99030
	8 modules	MIP99031
	12 modules	MIP99032
	18 modules	MIP99033
Surface mounting IP41 kit		MIP99034
Terminal block support (pack of 2)	18 modules	MIP99036
Terminal block	1 x 16 □ + 2 x 10 □ + 1 x 6 □	MIP99037
	1 x 16 □ + 4 x 10 □ + 3 x 6 □	MIP99038
	2 x 16 □ + 8 x 10 □ + 6 x 6 □	MIP99039
	2 x 16 □ + 9 x 10 □ + 9 x 6 □	MIP99040
Earth terminal block	3 x 16 □ + 12 x 2.5 □	13409
	4 x 16 □ + 20 x 2.5 □	13410
Ph+N insulated terminal block (pack of 2)	2 x (1 x 35 □ + 5 x 16 □)	13411
	2 x (1 x 35 □ + 7 x 16 □)	13412
Blanking plate	5 modules	13387
Symbol plate	Standard	13735
	Special	13736
Keylock		MIP99046
Marker light		MIP99050

PB104637-46



MIP99034

Mini Pragma

Surface and flush mounting enclosures



Accessories for surface and flush mounting enclosures

Connection accessories			Cat. no.
Type		Description	
Terminal block support (pack of 2)	18 modules	The terminal block support can be clipped directly onto the back at the top and bottom of the enclosure. It clips immediately into place. Moreover, an audible «click» ensures that it is in the correct position. It is sufficiently clear of the back not to impede the cable routing and to ensure easy connection. It provides: ■ a viewing angle ensuring that the cable is securely in place ■ a screwing angle ensuring that the screws are tight	MIP99036
Terminal block	1 x 16 □ + 2 x 10 □ + 1 x 6 □	Simplifies electrical connection ■ Installation: □ clips onto the terminal block support ■ Consists of: □ captive screws supplied open □ guides making it easier to insert cables into the tunnels	MIP99037
	1 x 16 □ + 4 x 10 □ + 3 x 6 □		MIP99038
	2 x 16 □ + 8 x 10 □ + 6 x 6 □		MIP99039
	2 x 16 □ + 9 x 10 □ + 9 x 6 □		MIP99040
Earth terminal block	3 x 16 □ + 12 x 2.5 □	With screws and tool-free connection	13409
	4 x 16 □ + 20 x 2.5 □		13410
Ph+N insulated terminal block (pack of 2)	2 x (1 x 35 □ + 5 x 16 □)	Insulated up to 80 A	13411
	2 x (1 x 35 □ + 7 x 16 □)		13412

Mini Pragma

Surface and flush mounting enclosures



Accessories for enclosures (continued)

Finishing accessories		Cat. no.
Type	Description	Solid white
Blanking plate 	Used to cover empty slots ■ 5 dividable modules ■ Colour: white RAL 9003 ■ Supplied in packs of 10	13387
Symbol plate 	Standard It contains self-adhesive pictograms used to identify the outgoers ■ Standard symbols: ☐ loads: power outlet, lighting, convector, etc. ☐ locations: bedroom, bathroom, etc.	13735
	Special ■ Special symbols: ☐ loads: surge arrester, gate, swimming pool, etc. ☐ locations: service room, computer room, etc.	13736
Keylock 	Used to protect access to the switchgear control in certain establishments, according to the regulations ■ Supplied with two metal keys ■ Fixed to the enclosure and the door after punch-out according to instructions	MIP99046
Marker light 	Is illuminated when the terminal block voltage of the light is 0 V. It has a continuous supercapacitor power supply that needs no battery, accumulator or maintenance ■ White LED ■ Autonomy: 20 mn ■ Light output: 5 lumens ■ Supply voltage: 240 V AC max ■ Recharge duration: 6 h ■ Service life: 15 years ■ Degree of protection: IP40, IK07 ■ Insulation class: 2 ■ Connection: 2,5 mm ² max ■ Withstand to fire and abnormal heat: 750°C	MIP99050

Mini Pragma L

Flush mounting

1 row, 8 to 12 modules

2 and 3 rows, 12 modules per row

PB 01/198-25



PB 01/199-30



PB 01/200-50



PB 01/201-70



Function

The Mini Pragma L is a distribution or subdistribution enclosure. It is used indoors, in housing and in commercial building sector, for new and renovated installations.

Description

Technical data

- Material:
 - self-extinguishing insulating material
 - fire and abnormal heat withstand: 650°C / 30 s as per IEC 60695-2-1
 - colour: white RAL 9003.
- Compliance with standards:
 - complies with IEC 60439-3 (EN 60-439-3)
 - IMQ approved as per Italian standards IEC 23-48.
- Degree of protection:
 - as per IEC 60529 (protection against solids liquids penetration):
 - IP40 with door
 - IP30 without door
 - as per EN 50-102 (protection against mechanical impacts): IK07
 - protection against indirect contact: class 2 (with insulating plugs on the fixing screws).

Composition

The flush-mounted Mini Pragma L is made up of:

- A base:
 - robust
 - with depth suited to low thickness walls
- 1 to 3 metallic rails, screwed onto the back symmetrically
- a cover: reversible front face, equipped with pre-cutout blanking plates.

Accessories delivered with the enclosure

The flush-mounted Mini Pragma L is delivered with a circuit identification strip per row: to be stuck onto the front face.

Catalogue numbers

Enclosures without door

Number of rows	Capacity in modules		Dimensions (mm)			Cat. no.
	modules of 9 mm	modules of 18 mm	H	W	D	
1	16	8	170	215	93	10675
1	24+2	12+1	185	285	93	10676
2	48	24	345	300	99	10677
3	72	36	470	300	99	10678

Accessories

Door for enclosure (Transparent - Tinted)

1 R	16	8				10334
1 R	24+2	12+1				10335
2 R	48	24				10305
3 R	72	36				10307

Blanking plates

Set of 10 blanking plates 13229

Terminal blocks

2 terminal blocks 4 holes for Mini Pragma L flush 8 modules	10317
2 terminal blocks 8 holes for Mini Pragma L flush 12 modules	10318
2 terminal blocks 10 holes for Mini Pragma L flush 24 modules	10337
2 terminal blocks 12 holes for Mini Pragma L flush 36 modules	10338

Mini Pragma L

Surface mounting

1 row, 8 to 12 modules
2 and 3 rows, 12 modules per row

PS100411



PS100410



PE100409



PE100408



Function

The Mini Pragma L is a distribution or subdistribution enclosure. It is used indoors, in housing and in commercial building sector, for new and renovated installations.

Description

Technical data

- Material:
 - self-extinguishing insulating material
 - colour: white RAL 9003.
- compliance with standards:
 - complies with IEC (60-439-3)
 - IMQ approved as per italian standards IEC 23-48.
- Degree of protection:
 - as per IEC 60529 (protection against solids and liquids penetration):
 - IP 40 with door
 - IP 30 without door
 - as per EN 50-102 (protection against mechanical impacts): IK 07
 - protection against indirect contact: class 2 (with insulating plugs on the fixing screws).

Composition

The surface-mounted Mini Pragma L is made up of:

- A back with:
 - a centered oblong opening to simplify fitting
 - oblong fixing holes used to adjust verticality
 - all that is needed for cable inlets:
 - pre-punchouts on 4 sides for 1-row enclosures
 - a large surface area for drilling (bell shaped saw, punches) at the top and bottom of the 2-and 3-row enclosures
- 1 to 3 metallic rails, screwed onto the back symmetrically
- a cover: reversible front face, equipped with pre-cutout blanking plates.

Accessories delivered with the enclosure

The surface-mounted Mini Pragma L is delivered with:

- Insulating plugs: to be fitted on the back fixing screws to ensure class 2 insulation
- A circuit identification strip per row: to be stuck onto the front face.

Catalogue numbers

Enclosures without door

number of rows	Capacity in modules of 9 mm	modules of 18 mm	Dimension (mm)			Cat. no.
			H	W	D	
1	16	8	168	215	94	10665
1	24+2	12+1	185	283	94	10666
2	48	24	326	256	101	10667
3	72	36	451	256	101	10668

Accessories

Door for enclosure (Transparent - Tinted)

1 R	16	8	10334
1 R	24+2	12+1	10335
2 R	48	24	10336
3 R	72	36	10324

Blanking plates

Set of 10 blanking plates 13229

Terminal blocks

2 terminal blocks 4 holes for Mini Pragma L surface 8 modules	10339
2 terminal blocks 8 holes for Mini Pragma L surface 12 modules	10347
2 terminal blocks 10 holes for Mini Pragma L surface 24 modules	10348
2 terminal blocks 12 holes for Mini Pragma L surface 36 modules	10349

Modular Enclosures

Pragma enclosures

Pragma presentation

Offer: earth + neutral version

Pragma is the first modular enclosure combining ergonomics, attractive design and robustness at top level. This new enclosure, available in surface and flush-mounted versions, has class II total insulation.

The surface-mounted enclosure

The range consists of enclosures with a width of 13, 18 or 24 modules of 1 to 6 rows and interfaces of 1 to 3 rows. The entire range can be associated horizontally or vertically.

Easy installation and large cabling space

The chassis shapes are rounded and are cable friendly and finger safe.

PB101381-30



Enclosure.

PB101382-15



Interface

PB101653-32



Customisable transparent enclosure door.

Cable or tube entry

Mounting lugs

Allow rapid wall mounting.

Cut-out plates

In technoplastic, allow rear entry of cables.

Split neutral terminal block

Allows installation of a neutral terminal block between 2 rows near an RCD.

Multi-position DIN rail

2 heights and 2 depths.

Removable chassis

Simplifies the contractor's work by allowing cabling on table.

Hinges

Simple and robust, they are mounted easily on the front face of the enclosure by rotation.

NG160 switch or circuit-breaker

Installed in 24-module enclosures. Can be equipped with a Vigì module and associated with the Polybloc 160.

Asymmetrical front plate

Used to adapt to the multi-position DIN rail and offers a large marking area.

Removable cable entry plates

Located on the 4 sides of the enclosure, they offer wide access and allow easy association.

Modular earth/neutral terminal blocks with quick connection:

- on chassis
- transformable into an incoming splitter block up to 125 A
- on the back in particular in the interface
- on DIN rail.

Insulating screen

Association kit

Interface

Emergency stop button and other types of buttons and indicator lights.

Modular switchgear up to 7 modules.

Plate for mounting wiring devices or industrial power outlets.

Entry by trunking

Example of 2 enclosures with a width of 24 modules of 3 rows and 2 interfaces of 3 rows, vertically associated.

The flush-mounted enclosure

The range consists of enclosures with a width of 13, 18 or 24 modules of 1 to 6 rows. The entire range can be associated horizontally or vertically.

Easy installation and large cabling space

The chassis shapes are rounded and are cable friendly and finger safe.

PB101420-35



Enclosures.

PB101420-32



Customisable transparent enclosure door.

Gypsum board mounting kit

Wall-mounted adjustable chassis

The chassis can be adjusted horizontally and in depth. The front face of the enclosure is always horizontal, whatever the position of the rear part flush-mounted in the wall.

Split neutral terminal block

Allows installation of a neutral terminal block between 2 rows near an RCD.

Multi-position DIN rail

2 heights and 2 depths.

Side pre-cutouts

Allow entry of cables or tubes.

Insulating screen

NG160 switch or circuit-breaker

Installed in 24-module enclosures thanks to a dedicated mounting plate. Can be equipped with a Vigi module and associated with the Polybloc 160.

Removable cable entry plates

Pre cut out for entry of cables or tubes.

PB101510-72



Cable or tube entry

Mounting lugs

Allow flush mounting without cement.

Modular earth/neutral terminal blocks with quick connection:

- on chassis
- transformable into an incoming splitter block up to 125 A
- on DIN rail.

Association kit

Allows entry of cables after flush mounting of two associated enclosures.

Hinges

Simple and robust, they are mounted easily on the front face of the enclosure by rotation.

Asymmetrical front plate

Used to adapt to the multi-position DIN rail and offers a large marking area.

Example of 2 enclosures with a width of 24 modules of 3 rows, vertically associated.

Pragma

Surface mounted enclosures

Offer: earth + neutral version

A range of ready-to-use enclosures devised for electricians: ergonomics and flexibility of installation. The Pragma offer is particularly robust, especially the 24-module enclosures thanks to their metal structure and their reinforced front face.



24-module enclosures



Customisable transparent door



Modular terminal blocks with screwless quick connections for small cables



Earth and neutral terminal blocks.



Neutral terminal blocks easy to split to adapt to earth leakage protection.



Possibility to transform the terminal block into an incoming splitter block up to 125 A, thanks to the support PRA90048.

Function

This distribution enclosure is intended for top of the range residential and tertiary sectors. An interface, dedicated to the end-user, allows installation of modular and specific switchgear: wiring devices, industrial power outlets, emergency stop and other buttons and indicator lights, etc. The 24-module enclosures can accommodate the NG160 incoming circuit-breaker or switch, equipped if necessary with an earth leakage protection module.

Description

18-module enclosures

13-module enclosures

Interfaces



Technical data of enclosures and interfaces

- 13-, 18-module enclosures and interfaces: technoplastic ⁽¹⁾, metal grey and titanium white.
 - 24-module enclosures: metal and technoplastic ⁽¹⁾, metal grey and titanium white.
 - Transparent doors:
 - for 13- and 18-module enclosures: technoplastic ⁽¹⁾, crystal
 - for 24-module enclosures: metal and glass, titanium white and crystal
 - Opaque doors:
 - for 13- and 18-module enclosures: technoplastic ⁽¹⁾, titanium white
 - for 24-module enclosures: metal, titanium white
 - for interfaces: technoplastic ⁽¹⁾, titanium white.
 - Withstand to fire and abnormal heat at 650 °C as per IEC 60695-2-11/EN 60695-2-11
 - Total insulation class II: conform to IEC 60439-3/EN 60439-3 § 7.4.3.2.2.
- Advantage:** thanks to its design, the entire Pragma range has "total insulation": no components on the enclosure, interface or door need be earthed.
- Degree of protection as per IEC 60529:
 - without door: IP30
 - with door: IP40
 - Degree of protection against mechanical impacts as per IEC 62262:
 - without door: IK08
 - with door: IK09
 - Operating temperature: -25 °C to +60 °C.

(1) Technoplastic material specially developed by Merlin Gerin.

Components delivered with each enclosure and interface

	Enclosure	Interface
Marking strips + label-guard	■	
Blanking plate strip	■	
Earth and neutral terminal blocks: see cat. no. table	■	
Identification label	■	■
Front face and back connection		■
1 plain plate per row		■

Technical data of terminal blocks

- Rated insulation voltages U_i : 800 V, U_{imp} : 8 kV
 - Complies with IEC 60947-7-1.
- The terminal blocks can also be mounted in Prisma Plus switchboards. The connections of the terminal blocks (either spring or screw connections), specially developed by Merlin Gerin, allow connection of flexible or rigid wires without ferrule as per IEC 60947-1 § 8.2.4., IEC 60998-1 (connection of wires with ferrule is also possible).

Catalogue numbers

Enclosures without door											Cat. no.			
Number of modules per row	Number of rows	Capacity in modules of 18 mm	Rated current In	Neutral terminal block			Earth terminal block			Without door	with customisable transparent door	with opaque door		
				Number of connections: total	50mm²	25mm²	6mm²	Number of connections: total	50mm²				25mm²	6mm²
13 modules	1	13	63 A	11	-	3	2 x 4	13	-	1	3 x 4	PRA20113	PRA29113	PRA30113
	2	26	63 A	19	-	3	4 X 4	17	-	1	4 X 4	PRA20213	PRA29213	PRA30213
	3	39	90 A	23	-	3	5 X 4	22	-	2	5 X 4	PRA20313	PRA29313	PRA30313
	4	52	90 A	27	-	3	6 X 4	26	-	2	6 X 4	PRA20413	PRA29413	PRA30413
18 modules	1	18	90 A	15	-	3	3 X 4	17	-	1	4 X 4	PRA20118	PRA29118	PRA30118
	2	36	90 A	24	1	3	5 X 4	26	1	1	6 X 4	PRA20218	PRA29218	PRA30218
	3	54	125 A	24	1	3	5 X 4	26	1	1	6 X 4	PRA20318	PRA29318	PRA30318
	4	72	125 A	28	1	3	6 X 4	30	1	1	7 X 4	PRA20418	PRA29418	PRA30418
24 modules	1	24	125 A	23	1	2	5 X 4	22	1	1	5 X 4	PRA20124	PRA29124	PRA30124
	2	48	125 A	29	1	4	6 X 4	27	1	2	6 X 4	PRA20224	PRA29224	PRA30224
	3	72	160 A	29	1	4	6 X 4	27	1	2	6 X 4	PRA20324	PRA29324	PRA30324
	4	96	160 A	35	1	6	7 X 4	32	1	3	7 X 4	PRA20424	PRA29424	PRA30424
	5	120	160 A	35	1	6	7 X 4	32	1	3	7 X 4	PRA20524	PRA29524	PRA30524
	6	144	160 A	35	1	6	7 X 4	32	1	3	7 X 4	PRA20624	PRA29624	PRA30624

Enclosure / interface association table ⁽¹⁾

Enclosures		Interfaces
 PB101502-15	13 modules 1 row	PRA06118
	18 modules 2 rows	PRA06218
	3 rows	PRA06318
	4 rows	PRA06118 + PRA06218
 PB101503-15	24 modules 1 row	PRA06124
	2 rows	PRA06224
	3 rows	PRA06324
	4 rows	PRA06124 + PRA06224
	5 rows	PRA06224 + PRA06224
	6 rows	PRA06224 + PRA06324
(1) Provide an association kit PRA90001 per interface.		

Interface (see association table opposite)			Cat. no.
Number of rows	Capacity in modules of 18 mm	Association with enclosures:	
1	7	13 modules	PRA06118
2	14	18 modules	PRA06218
3	21		PRA06318
1	7	24 modules	PRA06124
2	14		PRA06224
3	21		PRA06324

Accessories		Cat. no.
Opaque door for interfaces (delivered with key lock 405)		
1 row		PRA07118
2 rows		PRA07218
3 rows		PRA07318
Mounting in interfaces		
Kit for mounting modular switchgear up to 7 modules		PRA90065
Plain plate allowing mounting of buttons, indicator lights and in particular emergency stop		PRA90066
Kit for mounting industrial power outlets		PRA90067
Kit for mounting Unica wiring devices		PRA90071
Kit for mounting Altira wiring devices		PRA90074
Door for enclosures		
		Customisable transparent
13 modules	1 row	PRA15113
	2 rows	PRA15213
	3 rows	PRA15313
	4 rows	PRA15413
18 modules	1 row	PRA15118
	2 rows	PRA15218
	3 rows	PRA15318
	4 rows	PRA15418
24 modules	1 row	PRA15124
	2 rows	PRA15224
	3 rows	PRA15324
	4 rows	PRA15424
	5 rows	PRA15524
	6 rows	PRA15624
		Opaque
13 modules	1 row	PRA16113
	2 rows	PRA16213
	3 rows	PRA16313
	4 rows	PRA16413
18 modules	1 row	PRA16118
	2 rows	PRA16218
	3 rows	PRA16318
	4 rows	PRA16418
24 modules	1 row	PRA16124
	2 rows	PRA16224
	3 rows	PRA16324
	4 rows	PRA16424
	5 rows	PRA16524
	6 rows	PRA16624

Other accessories

See pages E22 to E24

Pragma

Flush mounted enclosures

Offer: earth + neutral version

A range of ready-to-use enclosures devised for electricians: ergonomics and flexibility of installation. The Pragma offer is particularly robust, especially the 24-module enclosures thanks to their metal structure and their reinforced front face.



Customisable transparent door

PB101429-32



A whole host of flush mounting options

PB101512-68



Removable entry plates.

PB101510-A



Gypsum board mounting kit
PRA90011

PB101510-B



Mounting lugs allow wall-mounting without cement.

Wall-mounted chassis adjustable horizontally and in depth

PB101510-C



The front face of the enclosure is always horizontally, whatever the position of the rear part flush-mounted in the wall.

Function

This distribution enclosure is flush-mounted in masonry or in gypsum partition. It is intended for the top of the range residential and tertiary sectors. The 24-module enclosures can accommodate the NG160 incoming circuit-breaker or switch, equipped if necessary with an earth leakage protection module.

Description

24-module enclosures

18-module enclosures

13-module enclosures



Technical data of enclosures

- 13, 18-module enclosures: technoplastic ⁽¹⁾, metal grey and titanium white.
 - 24-module enclosures: metal and technoplastic ⁽¹⁾, metal grey and titanium white.
 - Transparent doors:
 - for 13- and 18-module enclosures: technoplastic ⁽¹⁾, crystal
 - for 24-module enclosures: metal and glass, titanium white and crystal
 - Opaque doors:
 - for 13- and 18-module enclosures: technoplastic ⁽¹⁾, titanium white
 - for 24-module enclosures: metal, titanium white
 - Withstand to fire and abnormal heat (650 °C) as per IEC 60695-2-11/EN 60695-2-11.
 - Total insulation Class II: conform to IEC 60439-3/EN 60439-3 § 7.4.3.2.2.
- Advantage:** thanks to its design, the entire Pragma range has "total insulation": no components on the enclosure or door need be earthed.
- Degree of protection as per IEC 60529:
 - without door: IP30
 - with door: IP40
 - Degree of protection against mechanical impacts as per IEC 62262:
 - without door: IK08
 - with door: IK09
 - Operating temperature: -25 °C to +60 °C.

(1) Technoplastic material specially developed by Merlin Gerin.

Components delivered with each enclosure

- Marking strips + label-guard
- Blanking plate strip
- Identification label
- Earth and neutral terminal blocks: see p.E14.

Catalogue numbers

Enclosures without door											Cat. no.			
Number of modules per row	Number of rows	Capacity in modules of 18 mm	Rated current In	Neutral terminal block				Earth terminal block				Without door	with customisable transparent door	with opaque door
				Number of connections:				Number of connections:						
				total	50mm ²	25mm ²	6mm ²	total	50mm ²	25mm ²	6mm ²			
13 modules	1	13	63 A	11	-	3	2X4	13	-	1	3X4	PRA25113	PRA24113	PRA31113
	2	26	63 A	19	-	3	4X4	17	-	1	4X4	PRA25213	PRA24213	PRA31213
	3	39	90 A	23	-	3	5X4	22	-	2	5X4	PRA25313	PRA24313	PRA31313
	4	52	90 A	23	-	3	5X4	22	-	2	5X4	PRA25413	PRA24413	PRA31413
18 modules	1	18	90 A	15	-	3	3X4	17	-	1	4X4	PRA25118	PRA24118	PRA31118
	2	36	90 A	24	1	3	5X4	26	1	1	6X4	PRA25218	PRA24218	PRA31218
	3	54	125 A	24	1	3	5X4	26	1	1	6X4	PRA25318	PRA24318	PRA31318
	4	72	125 A	28	1	3	6X4	30	1	1	7X4	PRA25418	PRA24418	PRA31418
24 modules	1	24	125 A	23	1	2	5X4	22	1	1	5X4	PRA25124	PRA24124	PRA31124
	2	48	125 A	29	1	4	6X4	27	1	2	6X4	PRA25224	PRA24224	PRA31224
	3	72	160 A	29	1	4	6X4	27	1	2	6X4	PRA25324	PRA24324	PRA31324
	4	96	160 A	35	1	6	7X4	32	1	3	7X4	PRA25424	PRA24424	PRA31424
	5	120	160 A	35	1	6	7X4	32	1	3	7X4	PRA25524	PRA24524	PRA31524
	6	144	160 A	35	1	6	7X4	32	1	3	7X4	PRA25624	PRA24624	PRA31624

Accessories		Cat. no.	
Door for enclosures		Customisable transparent	Opaque
13 modules	1 row	PRA15113	PRA16113
	2 rows	PRA15213	PRA16213
	3 rows	PRA15313	PRA16313
	4 rows	PRA15413	PRA16413
18 modules	1 rows	PRA15118	PRA16118
	2 rows	PRA15218	PRA16218
	3 rows	PRA15318	PRA16318
	4 rows	PRA15418	PRA16418
24 modules	1 rows	PRA15124	PRA16124
	2 rows	PRA15224	PRA16224
	3 rows	PRA15324	PRA16324
	4 rows	PRA15424	PRA16424
	5 rows	PRA15524	PRA16524
	6 rows	PRA15624	PRA16624

Other accessories

See pages E15 to E17

Modular terminal blocks with screwless quick connections for small cables



Earth and neutral terminal blocks.



Neutral terminal block easy to split to adapt to earth leakage protection.



Possibility of transforming the terminal block into an incoming splitter block up to 125 A thanks to the support PRA90048.

Technical data of terminal blocks

- Rated insulation voltage Ui: 800 V.
- Impulse withstand voltage Uimp: 8 kV.
- Complies with IEC 60947-7-1.

The terminal blocks can also be mounted in Prisma Plus switchboards.

The connections of the terminal blocks (either spring or screw connections), specially developed by Merlin Gerin, allow connection of flexible or rigid wires without ferrule as per IEC 60947-1 § 8.2.4., IEC 60998-1 and IEC 60998-2-11 (connection of wires with ferrule is also possible).

Installation accessories for enclosures

Mounting accessories				
Designation	Description	Cat. no. for enclosures:		
		13 modules	18 modules	24 modules
Association kit	For surface-mounted enclosures			
	Internal association kit	PRA90001	PRA90001	PRA90001
	Metal reinforcement for external association	-	-	PRA90003
External mounting lugs	For flush-mounted enclosures	PRA90004	PRA90005	PRA90005
	For surface-mounted enclosures			
	4 metal lugs	PRA90009	PRA90009	PRA90009
Gypsum wall mounting kit	For flush-mounted enclosures			
		PRA90011	PRA90011	PRA90011
Accessories for switchgear installation and finishing				
Plain individual front plate	For surface- and flush-mounted enclosures	PRA90016	PRA90017	PRA90018
Blanking plates	Batch consisting of 6 strips: 2x13 modules + 2x18 modules + 2x24 modules	PRA90020	PRA90020	PRA90020
Identification sheets	Batch of 10 sheets of 3 strips x 13 modules A4 format for laser or inkjet printer	PRA90024	PRA90024	PRA90024
Drawing holder		PRA90082	PRA90082	PRA90082
DIN rail depth adapter	For surface-mounted enclosures	-	-	04227
Plain mounting plate	For surface- and flush-mounted enclosures H = 1 row	PRA90032	PRA90033	PRA90034
Row separator	IPXXB separator supplied with its supports	PRA90006	PRA90007	PRA90008
Locking accessories				
Lock for enclosure door	Keylock 405 (supplied with 2 keys)	PRA90039	PRA90039	PRA90039
	Keylock 455/1242E/2433A (supplied with 2 keys of each type)	PRA90055	PRA90055	PRA90055
	Male 7 mm triangle/square and 3 mm double bar lock	PRA90056	PRA90056	PRA90056
Kit for sealing the front face for enclosures and interfaces		PRA90083	PRA90083	PRA90083

Installation accessories for interfaces

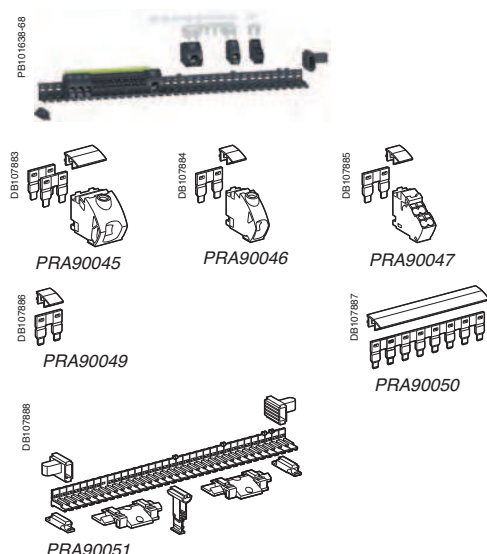
Mounting accessories			
Designation	Description	Cat. no. for associations with enclosures:	
		13 modules	24 modules
Association kit	Internal association kit	PRA90001	PRA90001
	Metal reinforcement for external association	-	PRA90003
	4 metal lugs	PRA90009	PRA90009
Accessories for switchgear installation and finishing			
Plain mounting plate	For mounting push buttons, indicator lamps and emergency stop switch	PRA90066	PRA90066
Blanking plates	Batch consisting of 6 strips: 2X13 modules + 2x18 modules + 2x24 modules	PRA90020	PRA90020
Identification sheets	Batch of 10 sheets of 3 strips x 13 modules A4 format for laser or inkjet printer	PRA90024	PRA90024
7- module kit	For installation of modular switchgear up to 7 modules H = 1 row	PRA90065	PRA90065

Electrical accessories: modular terminal blocks

- Rated insulation voltage U_i : 800 V.
- Impulse withstand voltage U_{imp} : 8 kV.
- Complies with IEC standard 60947-7-1.

The connections of the terminal blocks (either spring or screw connections), specially developed by Merlin Gerin, allow connection of flexible or rigid wires without ferrule as per IEC 60947-1 § 8.2.4., IEC 60998-1 and IEC 60998-2-1 (connection of wires with ferrule is also possible).

Terminal block components



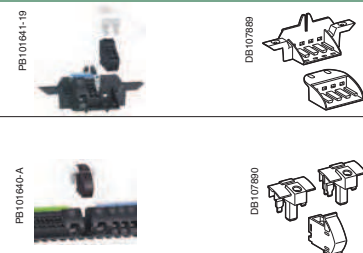
These components can be used to implement and install a terminal block:

- on the chassis near the conductor entry
 - on a DIN rail mounted on the enclosure chassis
 - on the back of the enclosure or interface
 - in the Prisma Plus switchboards on the functional uprights
- Permissible current:

- 50 mm² terminal block kit: 160 A max. at 40 °C
- 25 mm² terminal block kit: 90 A max. at 40 °C
- 6 x 4 mm² terminal block kit: 63 A max. at 40 °C
- 8-block junction kit:
 - 90 A with 1 junction
 - 160 A with 2 parallel-mounted junctions
- 2-block junction kit: 90 A.

Terminal blocks			Cat. no.
50 mm ² terminal block kit	W = 2 blocks	Batch of 2	PRA90045
25 mm ² terminal block kit	W = 1 block	Batch of 5	PRA90046
4 X 6 mm ² terminal block kit	W = 1 block	Batch of 10	PRA90047
Terminal block junction			
8-block junction kit	W = 8 blocks	Batch of 1	PRA90050
2-block junction kit	W = 2 blocks	Batch of 10	PRA90049
Terminal block support			
Terminal block support kit	W = 34 blocks maximum	Batch of 1	PRA90051

Accessories for neutral terminal blocks



Split neutral terminal block support			
Support kit	W = 4 blocks	Batch of 1	PRA90053
Allows installation of a neutral terminal block between 2 rows near an RCD in a surface-mounted or flush-mounted enclosure			
Earth and neutral connector			
Connector kit	W = 1 block	Batch of 1	PRA90052
Allows reliable connection between the earth terminal block and the neutral terminal block, where necessary (transition from TN-C to TN-S earthing system) With this exclusive connector, the disconnection between the 2 terminal blocks as an isolation measure is fully visible.			

Use as incoming splitter block



Incoming splitter block kit	W = 1 block	Batch of 4	PRA90048
For converting terminal block kits PRA90045/PRA90046/PRA90047 into an incoming splitter block up to 125 A and 50 mm ² . Permissible current: ■ entry via PRA90046 (1 x 25 mm ² - 1 block): 80 A ■ entry via PRA90045 (1 x 50 mm ² - 2 block): 125 A U_i : 400 V and U_{imp} : 6 kV			
Spare parts			

Accessories for enclosures

Designation	Description	Cat. no. for enclosures:		
		13 modules	18 modules	24 modules
Label-guard	Batch of 5, supplied with papermarking strip	PRA90027	PRA90028	PRA90029
Window type individual front plate	For surface- and flush-mounted enclosures Supplied with marking strip and label-guard	PRA90013	PRA90014	PRA90015
Entry flanges	For surface-mounted enclosures (Batch of 2)	PRA90040	PRA90041	PRA90042
Chassis	For surface-mounted enclosures Kit for 1 row	PRA90057	PRA90057	PRA90058
Door accessories				
Hinge	(Batch of 2)	PRA90043	PRA90043	PRA90043

Installation accessories for enclosures

Mounting accessories				
Designation	Description	Cat. no. for enclosures:		
		13 modules	18 modules	24 modules
FL21 entry flange support	For surface-mounted enclosures For mounting FL21 entry flanges: 08881/ 08891/ 08892/ 08895/ 08896/ 08897	-	-	PRA90023
Accessories for switchgear installation and finishing				
White individual front plate		PRA91013	PRA91014	PRA91015
Plain white individual front plate		PRA91016	PRA91017	PRA91018
White blanking plates	Batch consisting of 6 strips: 2 X 13 modules + 2 x 18 modules + 2 x 24 modules	PRA91020	PRA91020	PRA91020
NG 160 mounting plate	For flush-mounted enclosures	-	-	PRA90031
Tube entry plate	For surface-mounted enclosures	PRA90084	PRA90085	-
White blanking plate		PRA91020	-	-

Installation accessories for interfaces

Accessories for switchgear installation and finishing				
Designation	Description	Cat. no. for enclosures:		
		13 modules	18 modules	24 modules
Plain white mounting plate	For mounting push buttons, indicator lamps and emergency stop switch	PRA91066	PRA91066	
White blanking plate	Batch consisting of 6 strips: 2 x 13 modules + 2 x 18 modules + 2 x 24 modules	PRA91020	PRA91020	
7-module white kit	For installation of modular switchgear up to 7 modules H = 1 row	PRA91065	PRA91065	
Kit for mounting wiring devices	H = 1 row	PRA90070	PRA90070	
White kit for mounting wiring devices	H = 1 row	PRA91070	PRA91070	
Kit for mounting Unica wiring devices	H = 1 row	PRA90071	PRA90071	
Kit for mounting Altira wiring devices	H = 1 row	PRA90074	PRA90074	
White kit for mounting Altira wiring devices	H = 1 row	PRA91074	PRA91074	
Kit for mounting Merlin Gerin industrial power outlets	H = 1 row	PRA90067	PRA90067	
White kit for mounting Merlin Gerin industrial power outlets	H = 1 row	PRA91067	PRA91067	
Compact mounting kit	Can only be installed in interfaces PRA06224/ PRA06324 associated with the 24-module enclosures H = 2 rows	-		PRA90068
Vigicompact mounting kit	Can only be installed in the three-row PRA06324 interface associated with 24-module enclosures H = 3 rows	-		PRA90069

Electrical accessories: modular terminal blocks

Earth terminal blocks				
Designation	Description	Cat. no. for enclosures:		
		13 modules	28 modules	24 modules
Earth terminal blocks	17 points	PRA90086	-	-
	22 points	PRA90087	-	-
	26 points	-	PRA90088	-
	30 points	-	PRA90089	-
	27 points	-	-	PRA90090
	32 points	-	-	PRA90091

Modular Enclosures

Kaedra weatherproof enclosures

Kaedra Presentation

Multi-function weatherproof enclosures with power outlets



The first range of weatherproof enclosures combining 3 functions

With Kaedra, it is easy to perform the 3 functions of an electrical installation:

- **distribute:** the 3 to 72 module enclosures for modular switchgear accommodate the elements for protection of circuits and people
- **supply:** the flush-mounted power outlets of various sizes are installed in the enclosures for power outlets or with interface
- **control:** emergency stop, control and signalling buttons are directly accessible on the front face.

39 catalogue numbers for a whole host of configurations up to 125 A

Combination of distribution, supply and control functions is possible:

- in a single enclosure (enclosure for modular switchgear with interface)
- by horizontally and/or vertically associating enclosures.

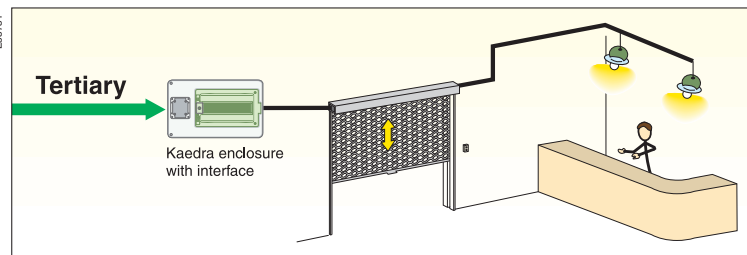
In this way, Kaedra can be adapted and upgraded for problem-free production of all installation types.

059466

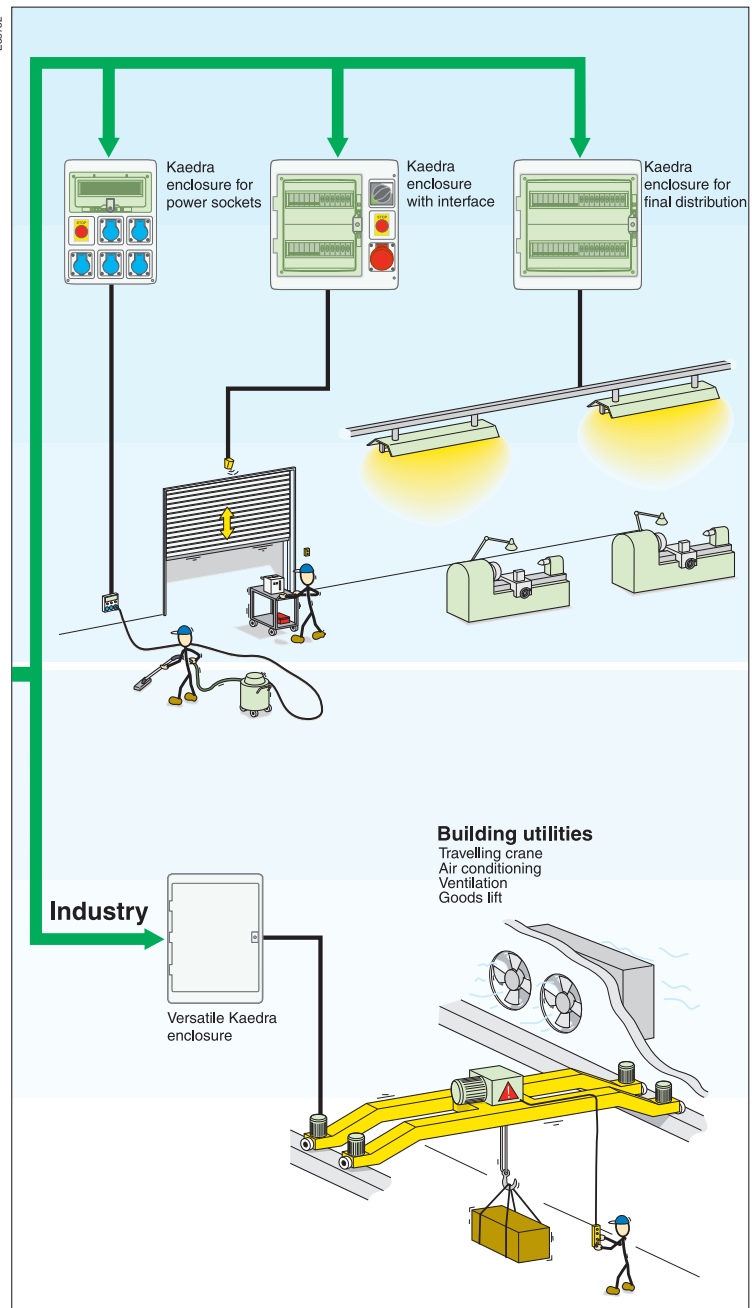


A large assembling capacity.

E88731

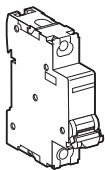


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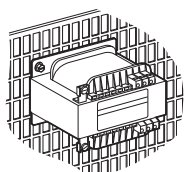


Enclosures adaptable to all situations

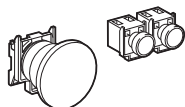
Modular switchgear



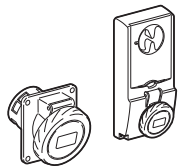
Non-modular switchgear



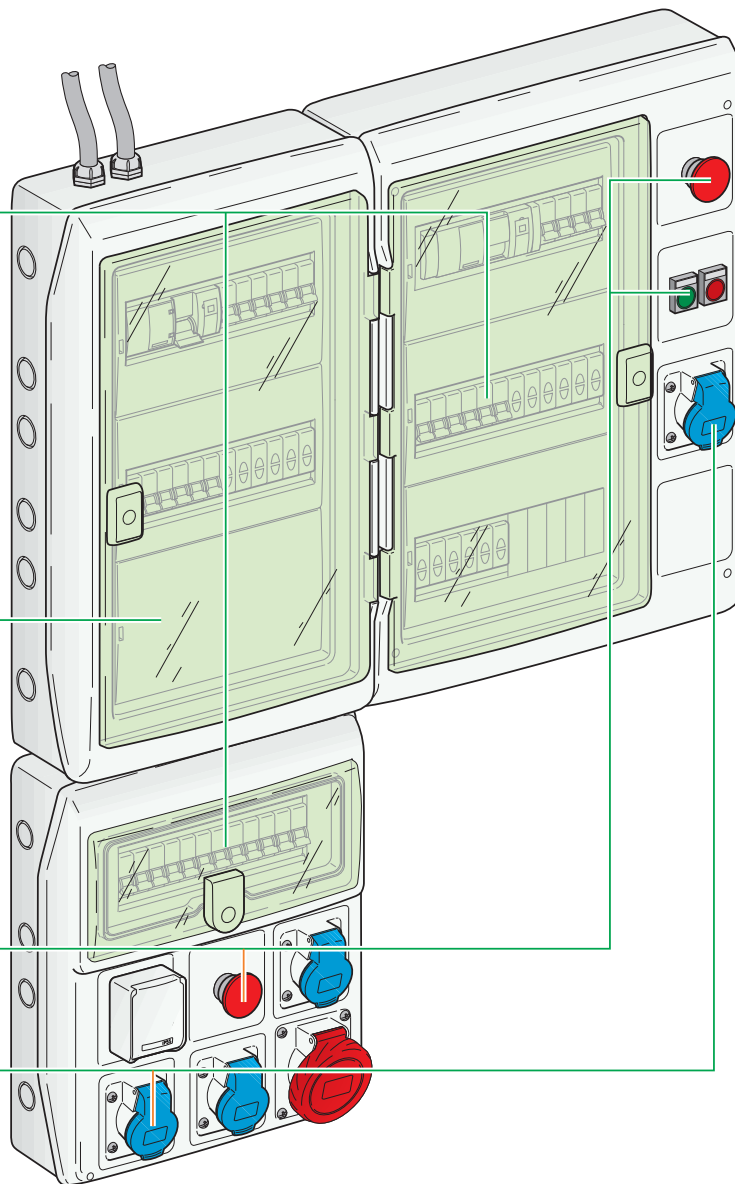
Interface switchgear



PK power outlet base



DB106723



Modular Enclosures

Kaedra weatherproof enclosures

Kaedra Presentation

Multi-function weatherproof enclosures **3x** easier



A design, choice and ordering aid tool

The assistance software lets you:

- automate choice of components
- design a set of associated enclosures
- use the many mounting possibilities.

Genuine cabling convenience on site or in the workshop

The enclosures provide the space you require for insertion of hands or wiring routing:

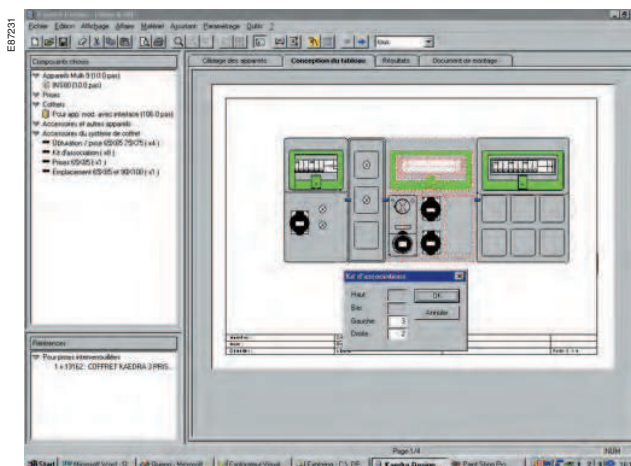
- in the side corridors
 - under the amply spaced out rails at the bottom.
- Dovetails arranged along the walls and on the chassis are use to organise wiring by clipping on of straps or small terminal blocks to ensure clear, neat cabling.

Enclosures for every day use

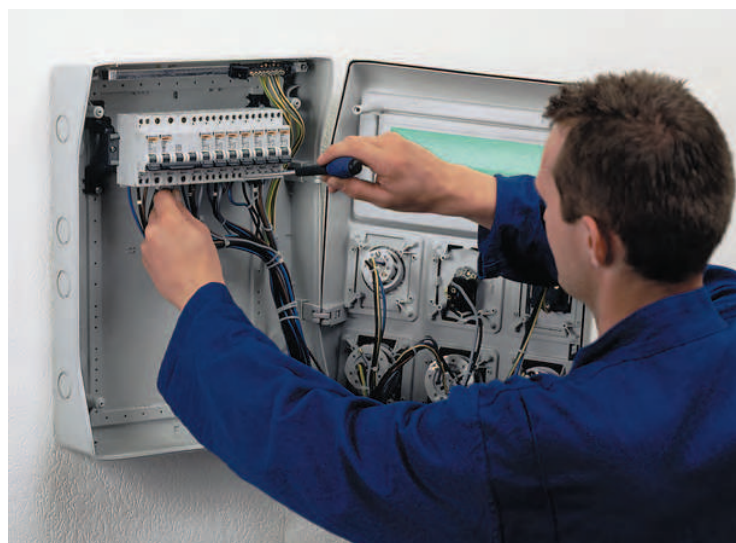
Kaedra enclosures satisfy all the requirements for every use with:

- transparent doors for optimum visibility of devices
- secured closing thanks to the multiple latching points of the espagnolette bolt
- a sober, elegant design.

Installing Kaedra is child's play.



A design, selection and control software.



2 hinges to hold the front face in position.



Espagnolette bolt: 2 or 4 latching points, only 1 handle.

Tricks to save time

A large number of easy associations

Kaedra enclosures are easy to associate: besides the numerous possible configurations, there is a high degree of extension flexibility. Association allows insertion of cables, guarantees IP withstand and mechanical withstand.

Adjustable distance between rail axes and depth

Each rail can assume 4 positions (2 in height and 2 in depth), thereby giving priority to a cabling area.

A removable chassis...

The chassis can be equipped and cabled with ease on a table. It is easily reassembled by means of oblong openings which hold it in place and allow it to be freely screwed into place.

... and cleavable

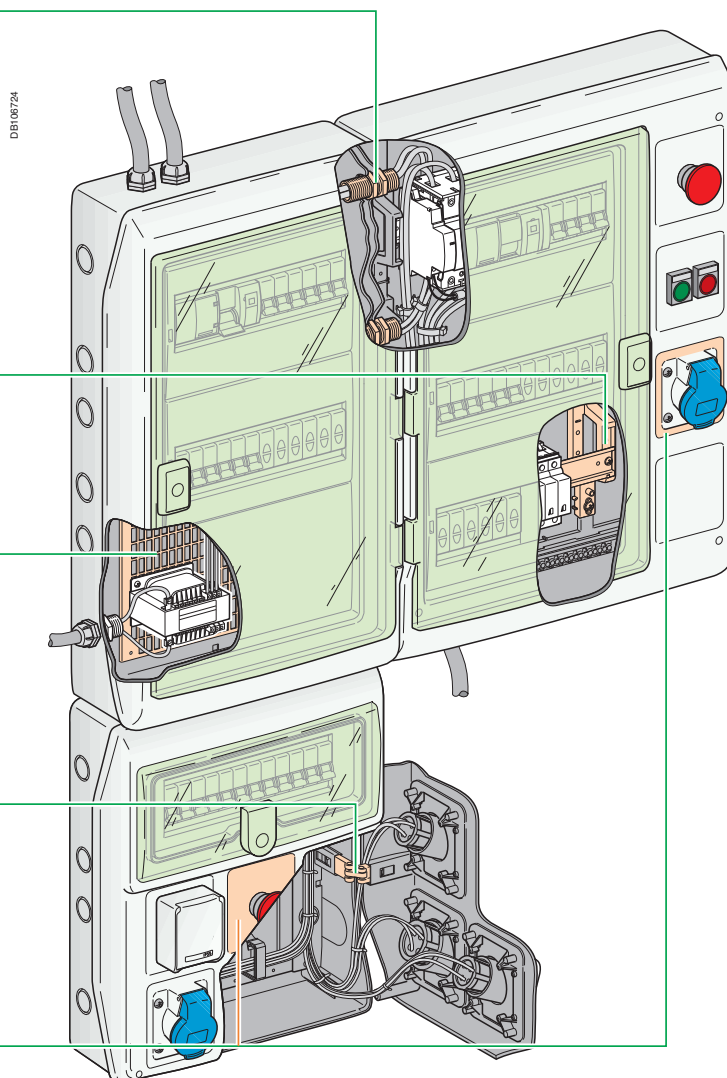
To allow mounting of non-modular switchgear on a plate, the chassis can be cut.

Front face / back hinges

These hinges are clipped onto the left or right, thus simplifying the cabling of enclosures accommodating power outlets on the front face. The reversability of front faces lets you choose the direction of opening of the door for enclosures for modular switchgear.

Functional plates

These allow mounting of power outlet bases of various sizes (or other devices) in the same opening.



Modular Enclosures

Kaedra weatherproof enclosures

Kaedra Presentation

Multi-function weatherproof enclosures **3x** more attractive



Increased safety

Kaedra withstands harsh environments:

- IP65: protection against ingress of solid and liquid bodies
 - IK09: protection against shocks.
- It is made of insulating material, class 2, and can be sealed and/or locked (key-lock or insert). It complies with standard IEC 60439-3.

Completely safe maintenance

To simplify and increase safety of operation, access to the devices can be differentiated:

- protection devices are clearly visible behind the door, if necessary locked to prevent access
- control and signalling devices are accessible directly on the front face (emergency stop, control button, etc.).

Enclosures that blend in perfectly

Its colour and sobriety make Kaedra suitable for most industrial, small contracting and tertiary premises. Many elements ensure installation with a careful finish:

- a carefully organised, spaced out and easy-to-modify cabling
- the front plates, blanking plates and functional plates blend harmoniously with the enclosure shape
- clear, neat marking by means of the removable labels protected by a transparent cover.

With Kaedra, robustness assumes the shapes and colours of beauty.

ED7246



ED7249



ED7250



A consistent range of enclosures



Enclosures for modular switchgear.



Enclosures for modular switchgear with interface.



Interface enclosures.



Enclosures for power outlets.



Versatile enclosures.

058072



Kaedra

The most comprehensive enclosure range

Enclosure for modular switchgear.
Enclosures for modular switchgear with interface.
Enclosures for power outlets.
Versatile enclosures.

For the production of electrical switchboards incorporating protection, control and distribution

- modular protection devices
- power outlets
- pushbuttons and indicator lights, etc.
- non-modular switchgear (transformer, motor control, etc.).

For tertiary, small contracting and industrial sectors

For environments requiring optimum protection of persons and electrical switchgear.

Kaedra is thus a comprehensive and consistent solution for the installation of all Schneider Electric switchgear, incorporating safety, functionality, ergonomics and attractive design.

059445



Safety

Kaedra switchboards guarantee a high degree of protection and increased dependability thanks to:

- their degree of protection (IP65)
- their high impact strength (IK09) and resistance to chemical and atmospheric agents, UVs, etc.
- class 2 insulating material
- optional locking of the door and sealing of the front face and front plates
- conformity with IEC 670 standard for empty enclosures and with IEC 439-3 standard for equipped switchboards.

Ergonomics

Kaedra switchboards offer remarkable cabling space.

Both the cable inlet and internal distribution is simplified.

The transparent doors enable permanent, immediate checking of operating conditions.

The interface zone offer quick access to power outlets and control devices.

The functional openings allow rapid installation of all devices directly or using matching plates.

The frame and all its possibilities guarantee assembly time savings.

Attractive design

Their modern, rounded shape, result of in-depth design and ergonomic studies, make the Kaedra switchboards ideal for use even in places visible to the general public.

Their innovating colours ensure enhanced integration, while at the same time guaranteeing the basic requirements of visibility and inspection of switchgear.

Enclosures for modular switchgear

Available in 7 versions from 3 to 72 modules. They allow installation of modular switchgear up to 125 A, as well as non-modular switchgear on slotted mounting plate.

Enclosures for modular switchgear with interface

Available in 3 versions of 12, 24 and 36 modules. The interface zone offers the possibility, thanks to the functional plates, of installing on the switchboard front face, control or protection devices, indicator lights and PK series power outlets of the domestic or industrial type. They thus ensure completely safe use.

Interface enclosures

Available in 2 versions with 2 or 3 openings. They can be used by themselves, horizontally or vertically, or associated with other enclosures as cable trunking or interface zone (control devices, indicator lights, power outlets, etc.).

Versatile enclosures

Available in 5 sizes. They are designed for production of control and monitoring switchboards with non-modular type devices.

Enclosures for power outlets

90 x 100 mm openings

Available in versions with 1 to 8 openings. They are characterised for the new functional feature with openings allowing installation of all PK power socket outlets or the incorporation of control and indicator light functions.

103 x 225 mm opening

Available in versions with 1 to 4 openings. They can accommodate the new PK Unika interlockable power outlets.

Versatile (smooth surface to be drilled)

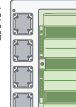
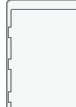
Available in 5 sizes. They allow mounting of flush-mountable power socket outlets up to 125 A.

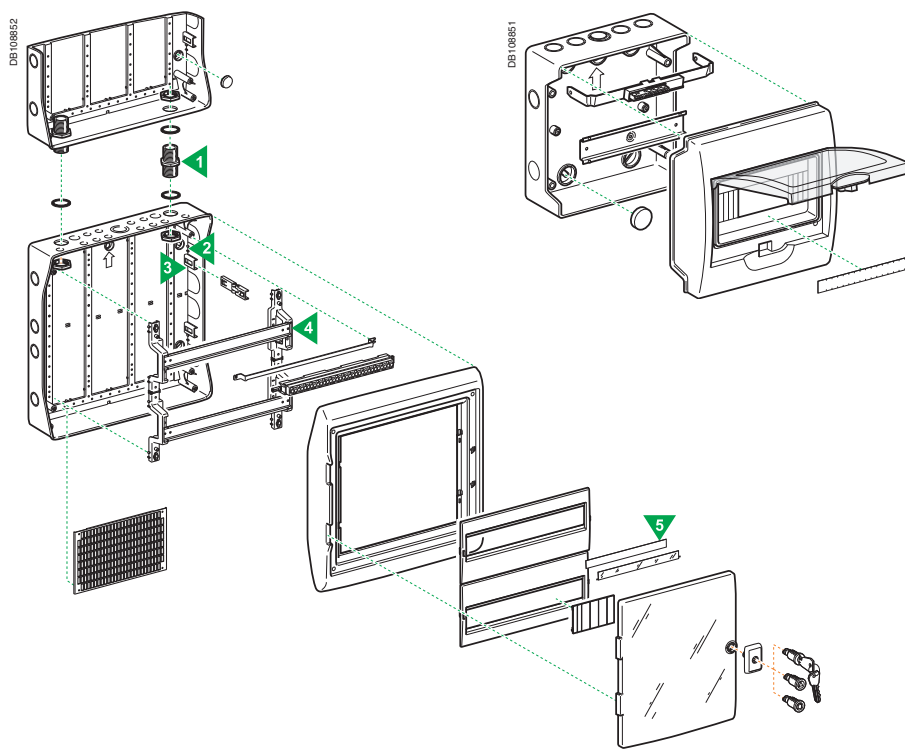


Range of weatherproof mini enclosures

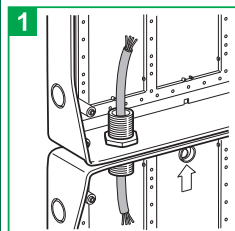
1 row								
Part Number	13175	13176	13177	13975	13976	13977	13978	13979
Nbr of modules	4	4	4	3	4	6	8	12
Width	98	98	98	80	123	159	195	267
Height	248	310	392	150	200	200	200	200

Range of weatherproof mini enclosures

mm	138	236	340	448	
	5 modules	8 modules	12 modules per row	12 + 1 modules	18 modules per row (12 modules if interface)
280			 13981	 13982	 13990
335				 13180	 13191
460	 13178	 13993	 13983	 13181	 13195
	 13185	 13189	 13186	 13190	 13984
				 13187	 13192
				 13991	 13182
					 13197
610	 13994		 13985	 13196	 13986
					 13992
					 13198
842				 13987	 13199

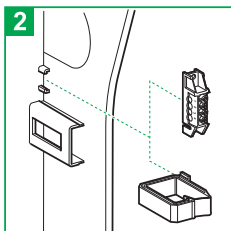


A few tricks



Add-on possibility

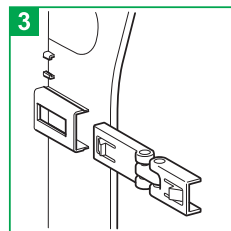
Enclosures can be horizontally or vertically associated keeping the IP65 and allowing cable insertion.



Dovetails

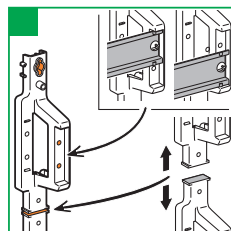
Arranged on the back and on the chassis, they can accommodate:

- 4-hole terminal blocks
- wiring straps.



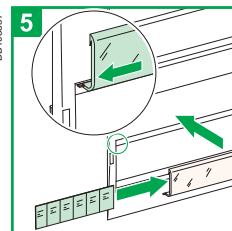
Back/front face hinges

Clipped onto the right or left, they simplify cabling and working on the interface zone.



Chassis

- DIN symmetrical rails positionable in 2 depths and 2 heights to privilege cabling room
- chassis that can be severed to install a mounting plate on the back.



Marking

Clip-on label covers ensure neat, quick and upgradeable marking.

Mechanical data

Enclosure

- reversible front face for opening of door to the left or right
- inside depth available for installation of non-modular switchgear between the slotted mounting plate and the plain front plate: 100 mm
- reversible front plate according to distance between axes of rails (125, 150, 175 mm).

Mini enclosure

- clip-on terminal block support
- back with dovetail to accommodate 4-hole terminal block and wiring strap.

Technical data

- self-extinguishing insulating material
- operating temperature: -25°C to + 60°C
- colour: light grey RAL 7035 and transparent green door
- IP65 as per IEC 60529
- IK09 as per EN 50102
- class 2: total insulation
- flame and abnormal heat resistance: 650°C as per IEC 60695-2-1
- complies with standard IEC 60439-3
- resistance to chemicals and atmospheric agents.

Modular Enclosures

Kaedra weatherproof enclosures

Kaedra enclosures and mini enclosures for modular switchgear



3 to 12 module mini enclosures, economic and compact.

Add-on 12 to 72 module enclosures.



Kaedra enclosures and mini enclosures for modular switchgear.

Mini enclosures					
Nbr of modules	3	4	6	8	12
1 row	 13975	 13976	 13977	 13978	 13979
Enclosures					
Nbr of rows	1	2	3	4	
12 modules per row	 13981	 13983	 13985		
18 modules per row	 13982	 13984	 13986	 13987	

Enclosure catalogue numbers

Data											Accessories delivered with an enclosure catalogue number (2)										Cat. No.
Row	Total mod.	M	16	20	20	25	32	50	Dimensions (mm)			Marking kit	Wiring strap	Terminal block support	Terminal block number of holes						
		PG			11	16	21	29/36	W	H	D				4	8	16	22	32		
Mini enclosures																					
1	3					1			80	150	98	1									13975
	4			2		1			123	200	112	1									13976
	6		1	1		1			159	200	112	1									13977
	8		2	2		1			195	200	112	1									13978
	12		2	2		2	1		267	200	112	1									13979
Enclosures																					
1	12		6		6	2	3		340	280	160	1	1	1	1	1					13981
	18				10	4	2	1	448	280	160	1	1	1	1		1				13982
2	24		6		6	2	3		340	460	160	2	2	1	1			1			13983
	36				10	4	2	1	448	460	160	2	2	1	1				1		13984
3	36		6		6	2	3		340	610	160	3	3	1	1				1		13985
	54				10	4	2	1	448	610	160	3	3	2	1			2			13986
4	72				10	4	2	1	448	842	160	4	4	2	1				2		13987

(1) Concentric pre-cutouts of the PG and ISO/metric type (EN 50262).

(2) Accessories also delivered:

- mini enclosures: class II plugs
- enclosures: class II plugs and blanking plates (5 modules of 18 mm per row).

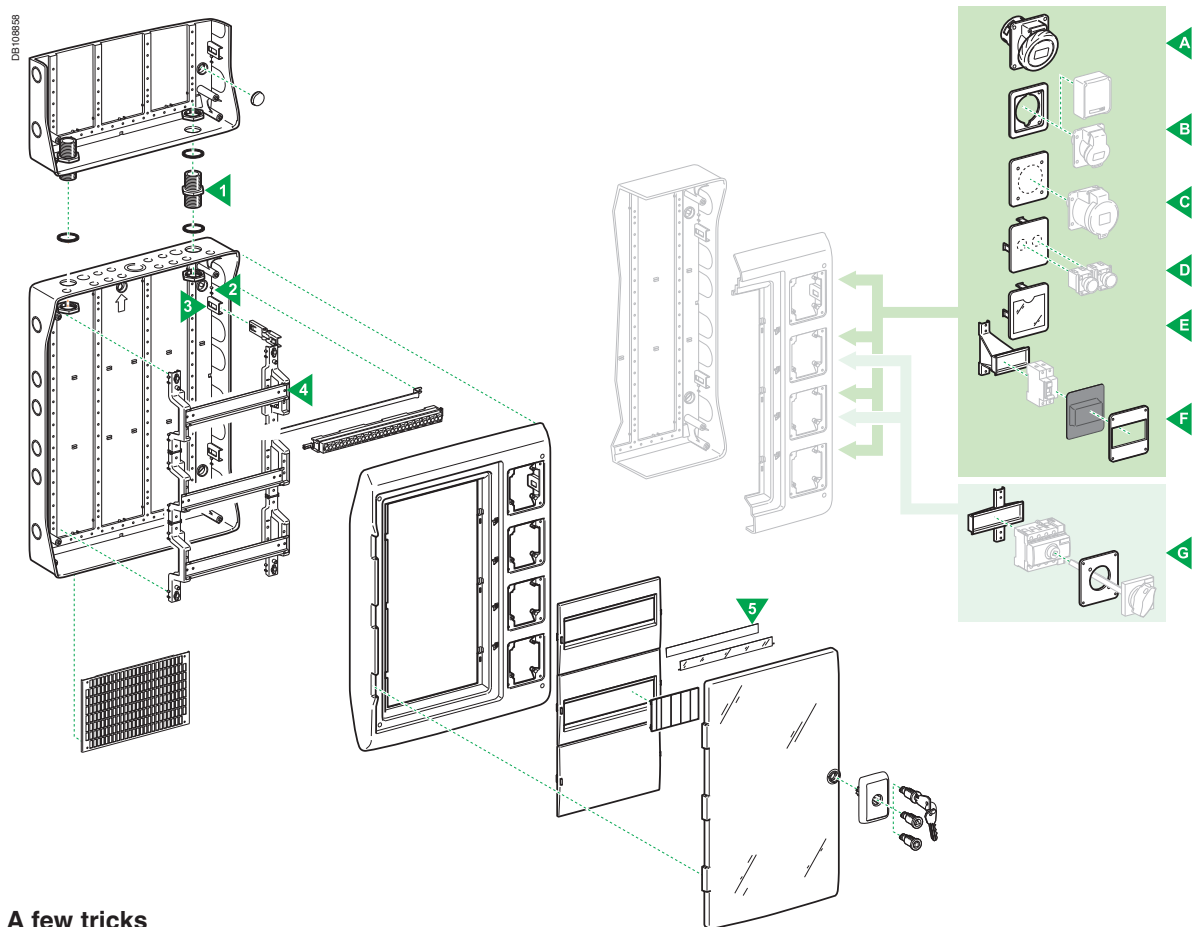
Catalogue numbers of the main accessories (1)

Name	Description	Mini enclosures	Enclosures	Cat. No.
Association kit	2 sleeves + 4 nuts	■	■	13934
Wall mounting lugs		■	■	13935
Slotted mounting plate		■	■	13941
Plain plate	12 modules	■	■	13944
	18 modules	■	■	13945
Wiring strap		■	■	13946
Sealing kit		■	■	13947
Keylock		■	■	13948
Insert	triangle	■	■	13949
	square	■	■	13950

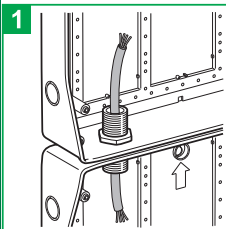
Other accessories available for these enclosures (1):

Row separator, jack-up block, junction for trunking, blanking plate, terminal block support, insulated terminal blocks, IP2 covers, cable support sleeves, cable gland, self-adhesive symbols, self-adhesive sheets.

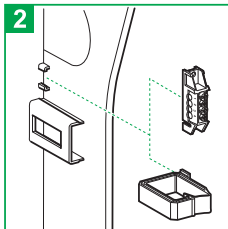
(1) the complete description of the various accessories is given on page E44 to E45.



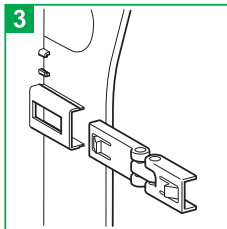
A few tricks



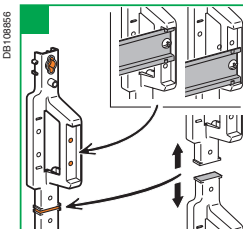
Add-on possibility
Enclosures can be horizontally or vertically associated keeping the IP65 and allowing cable insertion.



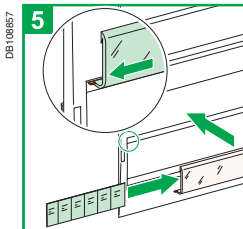
Dovetails
Arranged on the back and on the chassis, they can accommodate:
■ 4-hole terminal blocks
■ wiring straps.



Back/front face hinges
Clipped onto the right or left, they simplify cabling and working on the interface zone.



Chassis
■ DIN symmetrical rails positionable in 2 depths and 2 heights to privilege cabling room
■ chassis that can be severed to install a mounting plate on the back.



Marking
Clip-on label covers ensure neat, quick and upgradeable marking.

Everything for the interface

Direct mounting

With plate cat. no. 13136

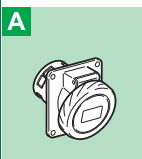
With plate cat. no. 13137

With plate cat. no. 13138

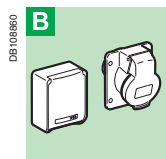
With plate cat. no. 13141

With kit cat. no. 13140

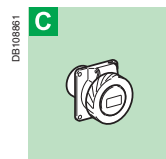
With kit cat. no. 13139



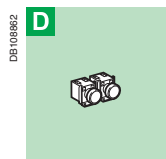
16/32 A slanting power outlets (90 x 100 mm).



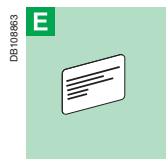
Domestic and LV power outlets (65 x 85 mm).



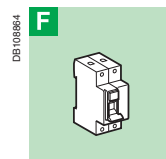
LV and ELV power outlets (65 x 65 mm and 75 x 75 mm).



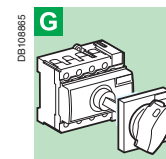
Buttons, indicator lights and switches 16 and 22 mm diameter.



Identification label



Modular switchgear up to 4 modules (e.g. residual current circuit breaker).



INS40/63/80 A.

Modular Enclosures

Kaedra weatherproof enclosures

Kaedra enclosures for modular switchgear with interfaces



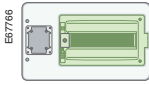
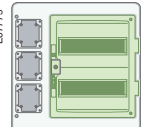
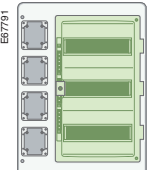
Enclosures offering:

- an interface zone always available for user and that can accommodate buttons, indicator lights, power outlets or modular switchgear
- a zone, behind the door, to install the modular switchgear.

059448-B



Kaedra enclosure for modular switchgear with interface.

Number of opening modules	12 1	24 3	36 4
			
	13990	13991	13992

Mechanical data

- reversible front face
- interface zone to the left or right. It is also an excellent cable duct
- door opening in either direction
- inside depth available for installation of non-modular switchgear between the slotted mounting plate and the plain front plate: 100 mm
- in enclosures with 3 or 4 openings, the kit for INS40/63/80 A must be mounted in the central openings.

Technical data

- self-extinguishing insulating material
- operating temperature: -25°C to + 60°C
- colour: light grey RAL 7035 and transparent green door
- IP65 as per IEC 60529
- IK09 as per EN 50102
- class 2: total insulation
- flame and abnormal heat resistance: 650°C as per IEC 60695-2-1
- complies with standard IEC 60439-3
- resistance to chemicals and atmospheric agents.

Enclosure catalogue numbers

Data											Accessories delivered with an enclosure catalogue number ⁽²⁾										Cat. No.			
Row	Total mod.	Slot for plate	Pre-cutout ⁽¹⁾ (top and bottom)					Dimensions (mm)			Marking kit	Wiring strap	Terminal block support	Terminal block number of holes					Plates for buttons, indicator lights 13138	65 x 85 mm power outlets 13136				
			M PG	20 11	25 16	32 21	50 29/36	W	H	D				4	8	16	22	32						
1	12	1		10	4	2	1	448	280	160	1	1	1	1		1								13990
2	24	3		10	4	2	1	448	460	160	2	2	1	1			1		3		1			13991
3	36	4		10	4	2	1	448	610	160	3	3	1	1				1	4		1			13992

(1) Concentric pre-cutouts of the PG and ISO/metric type (EN 50262).

(2) Accessories also delivered: class II plugs and blanking plates (5 modules of 18 mm per row).

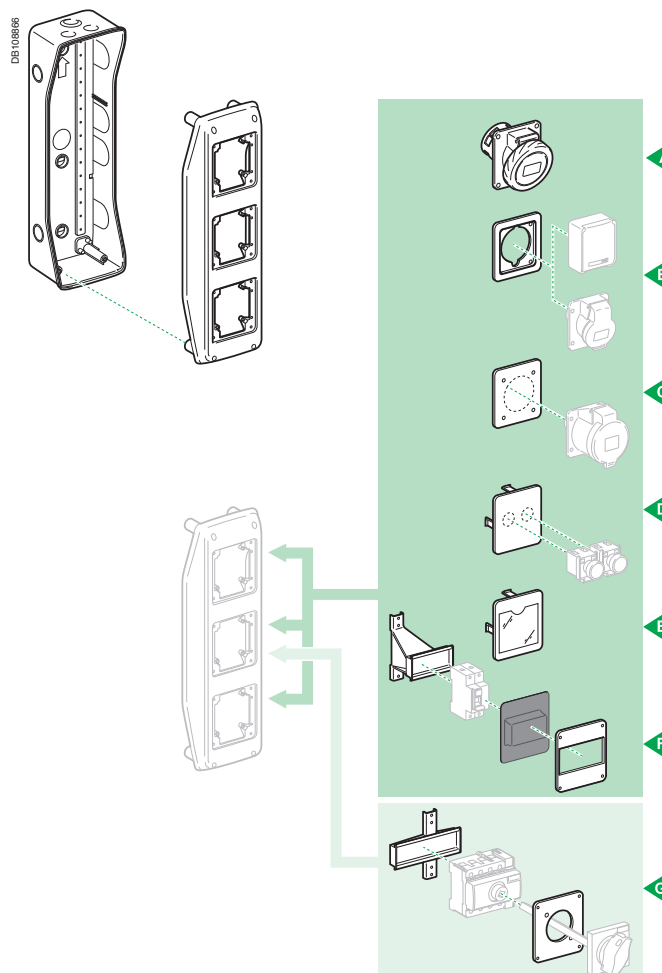
Catalogue numbers of the main accessories ⁽¹⁾

Name	Description	Cat. No.
Association kit	2 sleeves + 4 nuts	13934
Wall mounting lugs		13935
Slotted mounting plate		13941
Plain front plate	12 modules	13944
Interface plate for	65 x 85 power outlets	13136
	65 x 65 or 75 x 75 power outlets	13137
	pushbutton controls	13138
	identification	13141
Interface kit	INS40/63/80 A	13139
	modular switchgear up to 4 modules	13140
	(e.g. residual current circuit breaker)	
Wiring strap		13946
Sealing kit		13947
Keylock		13948
Insert	triangle	13949
	square	13950

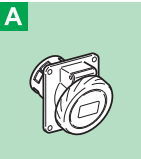
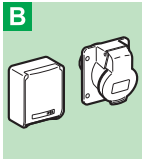
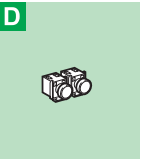
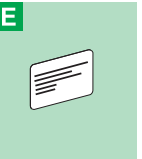
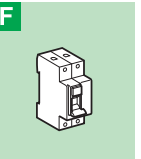
Other accessories available for these enclosures ⁽¹⁾:

Row separator, jack-up block, junction for trunking, blanking plate, terminal block support, insulated terminal blocks, IP2 covers, cable support sleeves, cable gland, self-adhesive symbols, self-adhesive sheets.

(1) the complete description of the various accessories is given on page E44 to E45.



Everything for the interface

Direct mounting	With plate cat. no. 13136	With plate cat. no. 13137	With plate cat. no. 13138	With plate cat. no. 13141	With kit cat. no. 13140	With kit cat. no. 13139
A  DB108859	B  DB108860	C  DB108861	D  DB108862	E  DB108863	F  DB108864	G  DB108865
16/32 A slanting power outlets (90 x 100 mm).	Domestic and LV power outlets (65 x 85 mm).	LV and ELV power outlets (65 x 65 mm and 75 x 75 mm).	Buttons, indicator lights and switches 16 and 22 mm diameter.	Identification label	Modular switchgear up to 4 modules (e.g. residual current circuit breaker).	INS40/63/80 A

Enclosures that can be installed alone, but also as an extension of another enclosure.

059453-B



Kaedra interface enclosure.

Number of 50 x 100 mm openings	3	4
	13993	13994

Mechanical data

- this enclosure can also act as a cable duct
- in enclosures with 3 or 4 openings, the kit for INS40/63/80 A must be mounted in the central openings.

Technical data

- self-extinguishing insulating material
- operating temperature: -25°C to + 60°C
- colour: light grey RAL 7035
- IP65 as per IEC 60529
- IK 09 as per EN 50102
- class 2: total insulation
- flame and abnormal heat resistance: 650°C as per IEC 60695-2-1
- complies with standard IEC 60439-3
- resistance to chemicals and atmospheric agents.

Enclosure catalogue numbers

Data								Accessories delivered with an enclosure catalogue number (1)		Cat. No.
Nb of op.	Dimensions			Pre-cutout (1) (top and bottom)				Plates for buttons, indicator lights	65 x 85 power outlets	
	W	H	D	M PG	20 11	25 16	32 21	13138	13136	
3	138	460	160		1	1	1	3	1	13993
4	138	610	160		1	1	1	4	1	13994

(1) Concentric pre-cutouts of the PG and ISO/metric type (EN 50262)

(2) Accessories also delivered: class II plugs.

Catalogue numbers of the main accessories ⁽¹⁾

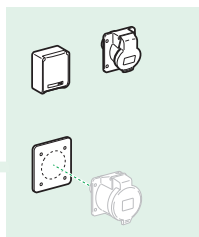
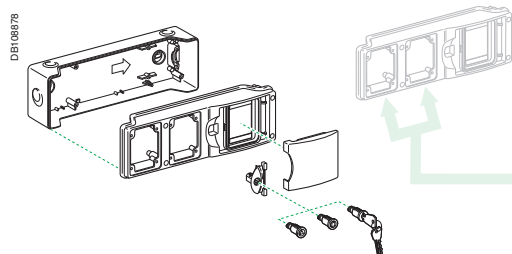
Name	Description	Cat. No.
Association kit	2 sleeves + 4 nuts	13934
Wall mounting lugs		13935
Interface plate for	65 x 85 power outlets	13136
	65 x 65 or 75 x 75 power outlets	13137
	pushbuttons controls	13138
	identification	13141
Interface kit	INS40/63/80 A	13139
	modular switchgear up to 4 modules	13140
	(e.g. residual current circuit breaker)	
Wiring strap		13946
Sealing kit		13947

Other accessories available for these enclosures⁽¹⁾:

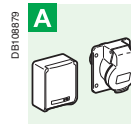
Jack-up block, insulated terminal blocks, cable support sleeves, cable gland.

(1) the complete description of the various accessories is given on page E37 to E38.

Mini enclosures with 65 x 85 mm openings

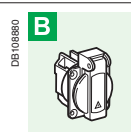


Direct
mounting



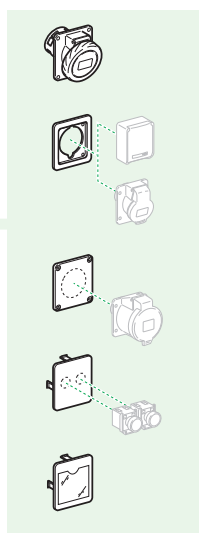
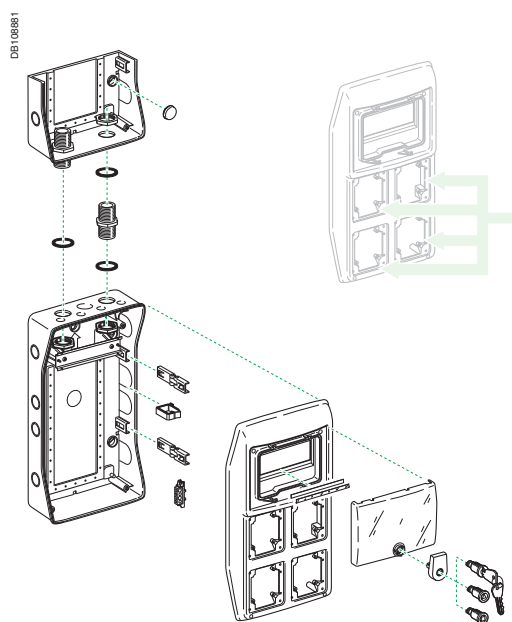
Domestic and LV power
outlets (65 x 85 mm).

With plate cat.
no. 13135



Power outlets
(50 x 50 mm).

Enclosures with 90 x 100 mm openings

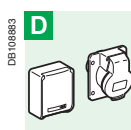


Direct
mounting



16/32 A slanting power
outlets (90 x 100 mm).

With plate
cat. no. 13136



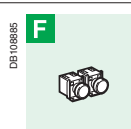
Domestic and LV power
outlets (65 x 85 mm).

With plate cat.
no. 13137



LV and ELV power
outlets (65 x 65 mm
and 75 x 75 mm).

With plate cat.
no. 13138



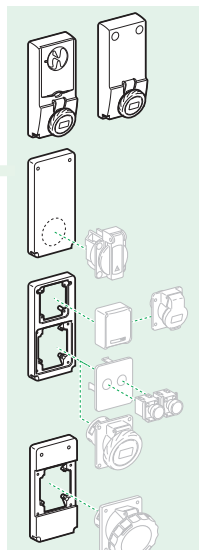
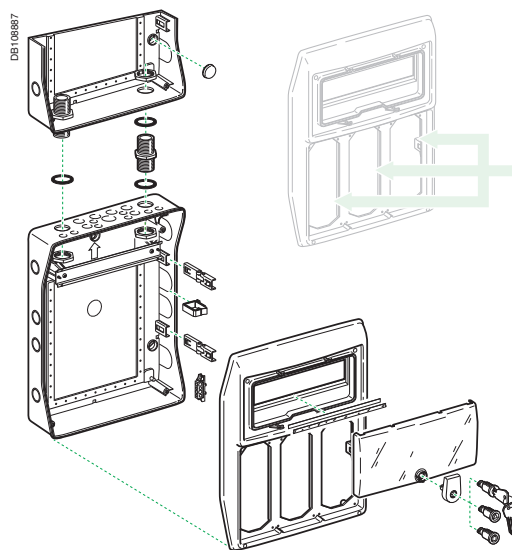
Buttons, indicator lights
and switches 16 and
22 mm diameter.

With plate cat.
no. 13141

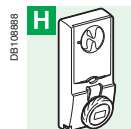


Identification label.

Enclosures with 103 x 225 mm openings

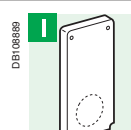


Direct
mounting



Power outlet interlocked
or with safety
transformer.

With plate cat.
no. 13143



Blanking and adaptation
plate to be drilled for 65
x 65 mm or 75 x 75 mm
power outlet.

With plate cat.
no. 13142

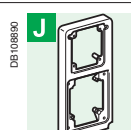
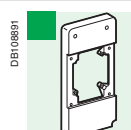


Plate with 2 openings:
■ 65 x 85 mm
■ 90 x 100 mm.

With plate cat.
no. 13144



63 A LV power outlet
(100 x 107 mm).

Modular Enclosures

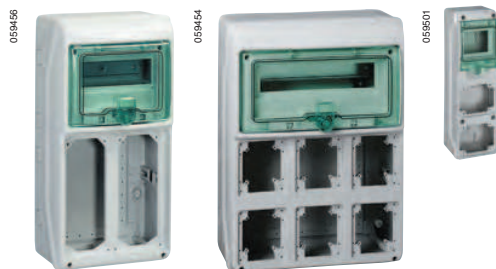
Kaedra weatherproof enclosures

Kaedra enclosures and mini enclosures for power outlets



Enclosures offering:

- a zone for industrial or domestic power outlets, buttons or indicator lights
- a row for modular switchgear protecting power outlets.



Enclosure and mini enclosure for power outlets

	Mini enclosures			Enclosures					See previous page
Nbr of mod.	4	4	4	5	8	12+1	12+1	18+1	0
	13175	13176	13177	13178	13179	13180	13181	13182	13993 13994

Enclosures for interlocked power outlets					Versatile enclosure
Nbr of mod.	5	8	12+1	18+1	
	13185	13186	13187	13188	See overleaf

Note: to mount other power outlets (e.g. 125 A, 100 x 114 mm), see versatile enclosures for power outlets pages E35 - E36.

Technical data

- self-extinguishing insulating material
- operating temperature: -25°C to +60°C
- colour: light grey RAL 7035 and transparent green wicket gate
- IP65 as per IEC 60529
- IK09 as per EN 50102
- class 2: total insulation
- flame and abnormal heat resistance: 650°C as per IEC 60695-2-1
- complies with standard IEC 60439-3
- resistance to chemicals and atmospheric agents.

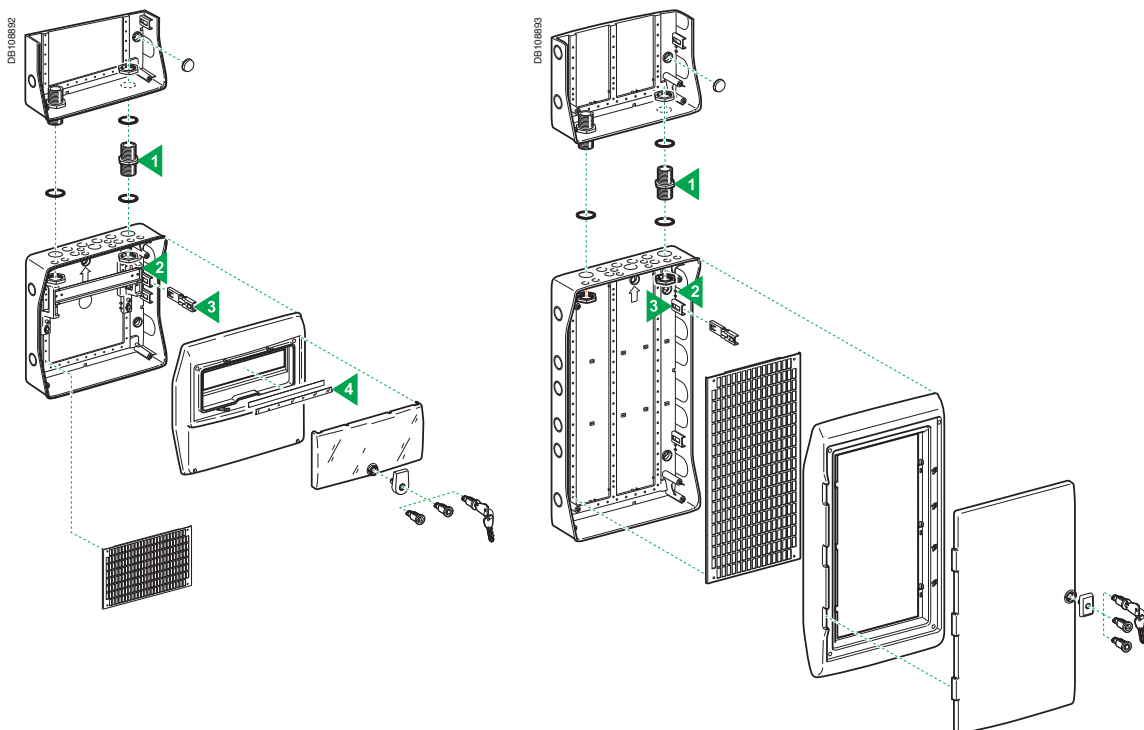
Enclosure catalogue numbers

Data		Pre-cutout (top and bottom) ⁽¹⁾						Dimensions (mm)			Accessories delivered with an enclosure catalogue number ⁽²⁾				Cat. No.
Total mod.	open	PG	16	20	25	32	50	W	H	D	Wiring strap	terminal block support	terminal block number of holes	plates cat. no.	
Mini enclosures for power outlets (65 x 85 mm openings)															
4	1				1			98	248	98.5			1		13175
4	2							98	310	98.5			1		13176
4	3				1			98	392	98.5			1		13177
Enclosures for power outlets (90 x 100 mm openings)															
5	2			1	1	1		138	460	160			1	2	13178
8	4			2	2	3		236	460	160	2	1		4	13179
12+1	3		6	6	2	3		340	335	160	2	1		3	13180
12+1	6		6	6	2	3		340	460	160	2	1		6	13181
18+1	8			10	4	2	1	448	460	160	2	1		8	13182
Enclosures for interlocked power outlets (103 x 225 mm openings)															
5	1			1	1	1		138	460	160			1		13185
8	2			2	2	3		236	460	160	2	1			13186
12+1	3		6	6	2	3		340	460	160	2	1			13187
18+1	4			10	4	2	1	448	460	160	2	1			13188

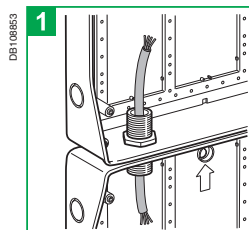
(1) Concentric pre-cutouts of the PG and ISO/metric type (EN 50262).

(2) Accessories also delivered:

- mini enclosures: class II plugs
- enclosures: class II plugs, blanking plates (5 modules of 18 mm per row) and a marking kit.

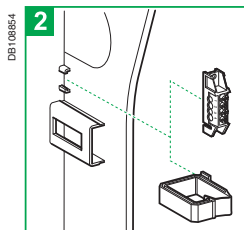


A few tricks



Add-on possibility

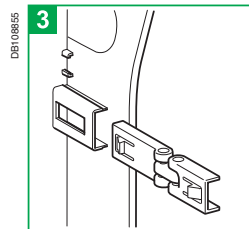
Enclosures can be horizontally or vertically associated keeping the IP65 and allowing cable insertion.



Dovetails

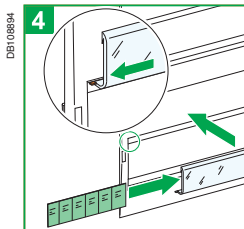
Arranged on the back and on the chassis, they can accommodate:

- 4-hole terminal blocks
- wiring straps.



Back/front face hinges

Clipped onto the right or left, they simplify cabling and working.



Marking

Clip-on label covers ensure neat, quick and upgradeable marking.

Modular Enclosures

Kaedra weatherproof enclosures

Kaedra

versatile weatherproof enclosures



The opaque door versatile enclosure provides a zone to install non-modular switchgear.

The versatile enclosure for power outlets provides a row for modular switchgear and a universal zone.

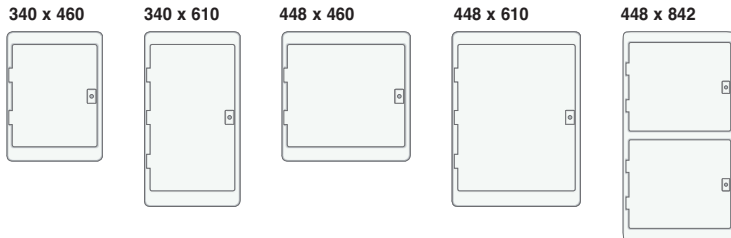


Opaque door Versatile Kaedra enclosure.



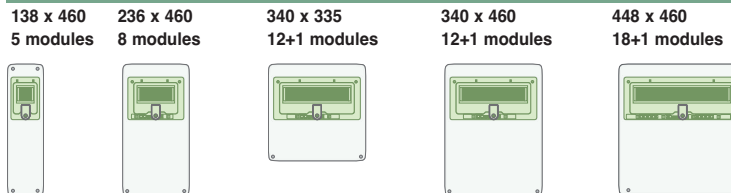
Versatile Kaedra enclosure for power outlets.

Opaque door versatile enclosures



13195 13196 13197 13198 13199

Versatile enclosures for power outlets



13189 13190 13191 13192 13193

Mechanical data

Opaque door versatile enclosure

- delivered with a slotted mounting plate mounted at the back
- available depth for installation of non-modular switchgear on mounting plate: 130 mm
- reversible front face to change door opening direction.

Technical data

- self-extinguishing insulating material
- operating temperature: -25°C to +60°C
- colour: light grey RAL 7035
- IP65 as per IEC 60529
- IK09 as per EN 50102
- class 2: total insulation
- flame and abnormal heat resistance: 650°C as per IEC 60695-2-1
- complies with standard IEC 60439-3
- resistance to chemicals and atmospheric agents.

Note: versatile enclosures for power outlets can accommodate power outlets up to 125 A.

Enclosure catalogue numbers

Dimensions (mm)			Nbr. of modules	Pre-cutout (top and bottom) ⁽¹⁾						Cat. No. (2)
W	H	D		M	16	20	25	32	50	
				PG		11	16	21	29/36	
Opaque door versatile enclosures										
340	460	160			6	6	2	3		13195
340	610	160			6	6	2	3		13196
448	460	160				10	4	2	1	13197
448	610	160				10	4	2	1	13198
448	842	160				10	4	2	1	13199
Versatile enclosures for power outlets										
138	460	160	5			1	1	1		13189
236	460	160	8			2	2	3		13190
340	335	160	12+1		6	6	2	3		13191
340	460	160	12+1		6	6	2	3		13192
448	460	160	18+1			10	4	2	1	13193

⁽¹⁾ Concentric pre-cutouts of the PG and ISO/metric type (EN 50262).

⁽²⁾ Accessories also delivered:

- opaque door versatile enclosures: class II plugs, mounting plate
- versatile enclosures for power outlets: class II plugs, blanking plates (5 modules of 18 mm) and marking kit.

Catalogue numbers of the main accessories ⁽¹⁾

Name	Catalogue number
Association kit	13934
Wall mounting lug	13935
Jack-up block	13938
Junction for trunking	13939
Wiring strap	13946
Slotted mounting plate 150 x 250	13941

⁽¹⁾ the complete description of the various accessories is given on page E37 - E38.

Description

For enclosure implementation

- **association kit:** used for horizontal or vertical association of two enclosures with one another while preserving IP65
- **wall mounting lugs:** used to fix the enclosure to the wall without using holes in the back of the enclosure
- **row separator:** used to create IP2 insulated zones. For example: separate strong and weak current zones
- **jack-up block:** used to detach the enclosure from the wall in order to route cables behind the enclosure (2 lengths of 1 metre to be cut)
- **plain front plate:** used to hide a zone without modular switchgear
- **blanking plate:** clipped onto the front plates to conceal slots with no devices
- **junction for trunking:** allows tidy incoming of cables in a trunking.

For switchgear implementation

- **functional plates for 90 x 100 mm slot:**
 - adaptation (screwed on) for 65 x 85 mm power outlets
 - blanking or adaptation (screwed on) for 65 x 65 mm or 75 x 75 mm power outlets (slot to be punched out)
 - blanking or adaptation (clipped on) for buttons, indicator lights and switches of diameters 16 and 22 mm (1 central slot or 2 side by side to punch out).
 - blanking for identification (clipped on)
- **functional plates for 103 x 225 mm slot:**
 - adaptation (screwed on) with 2 openings: 65 x 85 mm and 90 x 100 mm.
 - blanking adaptation (screwed on) offering 1 slot for 65 x 65 mm or 75 x 75 mm power outlets (to be punched out) and a versatile zone
 - adaptation (screwed in) for 63 A 100 x 107 mm LV power outlet
- **interface kit for 90 x 100 mm slot for:**
 - INS40 to 80 A (chassis + plate)
 - Modular switchgear up to 4 modules
- e.g. residual current circuit breaker (chassis + plate + membrane)
- **slotted plate (150 x 250 mm):** screwed onto the back of the enclosure, used to fix non-modular devices.

For electrical connection

- **terminal block support:** flat iron (12 x 2 mm), 2 versions: screwed onto the pins or onto the chassis
- **set of insulated terminal blocks with IP42 covers:**
 - 4 holes: clipped onto the terminal block supports, fixed onto walls by dovetails,
 - 8 holes: clipped onto the terminal block supports, clipped onto DIN symmetrical rail, screwed onto the back
 - 32 holes: clipped onto the terminal block supports
- **wiring strap:** used to guide cables along walls for simplified cabling (set of 5)
- **cable support sleeves:** used for incoming flexible cables
- **cable glands:** used for cable and tube incoming, guaranteeing tightness and mechanical withstand.

For identification

- **self-adhesive symbol:** allows identification of feeders by symbols:
 - currents: loads (power outlet, lighting, convector, etc.), places (bedroom, bathroom, etc.)
 - special: loads (surge arrester, gate, swimming pool, etc.), places (technical room, computer room, etc.)
- **self-adhesive sheets for SISmarker printing:** allows printing of customised labels using the SISmarker software.

For enclosure protection

- **sealing kit:** used to seal the front face on the back (2 screws) and the front plates on the front face (4 kits)
- **keylock:** Eurolocks combination no. 850. Installed in the door
- **insert** (male square or triangle, female key supplied): installed in the door.

For enclosure maintenance

- **front plate**
- **chassis 1 row:** can be combined to obtain a multi row chassis.

Terminal block composition			
Number of holes			Width in mm
Total	Cross section in mm²		
	10	16	
4	2	2	85
8	4	4	85
32	16	16	202

Catalogue numbers

Name	Description	Use mini enclosures	enclosures	Cat. No.
				
For enclosure implementation				
Association kit	2 sleeves + 4 nuts + 4 joints			13934
Wall mounting lugs (set of 4)				13935
Row separator	12 modules wide			13936
	18 modules wide			13937
Jack-up block				13938
Junction for trunking	enclosure 340 mm wide			13939
	enclosure 448 mm wide			13929
Blanking plate (set of 10 x 5 modules)				13940
For switchgear implementation				
Plate for 85 x 65 slot for 50 x 50 power outlets				13135
Plate for 90 x 100 slot for	65 x 85 power outlets			13136
	65 x 65 and 75 x 75 power outlets			13137
	ø 16 and 22 mm pushbutton controls			13138
	blanking and identification			13141
Kit for 90 x 100 slot for	INS40/63/80 A			13139
	residual current circuit-breakers			13140
Plate for 103 x 225 slot for	one 85 x 65 + one 90 x 100 slot			13142
	blanking (blank to be slotted)			13143
	(for 65 x 65 or 75 x 75 mm power outlet)			
	63 A LV power outlet (100 x 107 mm)			13144
Front plate	plain			13944
	12 modules			13945
	18 modules			13945
Slotted plate	150 x 250 mm			13941
For electrical connection				
Terminal blocks kit	5 x 4 holes (2 blue, 3 black)			13445
	2 black covers			
	2 green covers			
Terminal blocks kit	1 x 8 holes (blue)			13446
	1 green cover			
	1 support for 8 back mounting			
Terminal blocks kit	1 x 8 holes (blue)			13448
	1 green cover			
	1 support for 12 back mounting			
Terminal blocks kit	1 x 32 holes (blue)			13450
	1 green cover			
	1 support for 18 back mounting			
Terminal block support for mini enclosure	4 modules			13361
	6 modules			13362
	8 modules			13363
	12 modules			13364
Terminal block support for mounting on chassis	12 modules			13599
	18 modules			13595
Cable support sleeves varied diameter bag				14190
Cable gland	PG11			83992
	PG13,5			83993
	PG16			83994
	PG21			83995
	PG29			83996
	PG36			83997
Wiring strap (set of 5)				13946
For marking				
Self-adhesive symbols	standard			13735
	special			13736
Self-adhesive sheets for SISmarker printing				13260
For enclosure protection				
Sealing kit				13947
Keylock				13948
Insert	triangle			13949
	square			13950
For enclosure maintenance				
Front plate	12 modules			10200
	18 modules			10209
Chassis 1 row	12 modules			10210
	18 modules			10220

Kaedra

Multipole splitter blocks

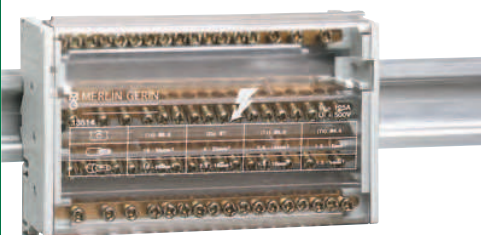
40 to 125 A stepped splitter blocks

Can be used in all types of enclosures, for distribution:

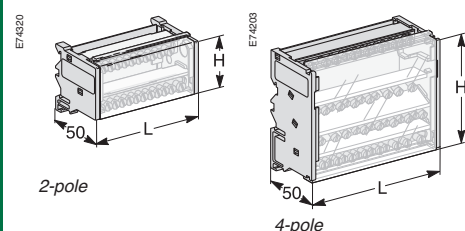
- from the incoming switchboard unit to sets
- from the incoming switchboard unit to devices
- from an incoming set to devices



2-pole

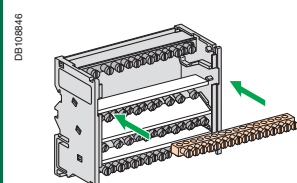


4-pole

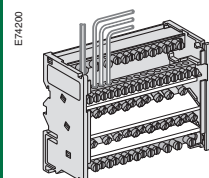


2-pole

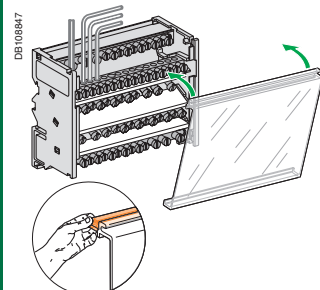
4-pole



DB 1038/46



E74203



DB 1038/47

Stepped splitter blocks are designed to distribute current in Pragma modular enclosures, in Prisma functional enclosures and in all types of enclosures.

- installation on DIN or Multifix rail; they can also be screwed onto a mounting plate or enclosure back
- delivered with cover and insulating back
- inter-insulated bars
- delivered with open screws (Posidriv recess + slot screws)
- incoming cable connection holes: staggered from bar to bar
- possibility of attaching Telemecanique markers on the bars' insulator for circuit identification.

Electrical data

- conform to standard EN 60947-7-1
- degree of pollution: 3
- nominal current: 40, 100 and 125 A
- permissible rated peak current I_{pk} : 20 kA
- rated short-time withstand current I_{cw} : 3.5 kA rms/1 s
- insulation voltage U_i : 500 V AC

40 to 125 A stepped splitter blocks

Type	Number/diameter (mm) of holes per phase:				Width in mod. of 9 mm	Dimensions	
		Ø 4.4	Ø 5.5	Ø 7	Ø 8.5	W (mm)	H (mm)
2-pole							
100 A	7 holes	3	3	1		7	62
125 A	13 holes	5	5	2	1	12	107
4-pole							
40 A	13 holes	11	2			10	89
100 A	7 holes	3	3	1		7	62
125 A	13 holes	5	5	2	1	12	107
125 A	17 holes	7	7	2	1	15	134

Min/max connection capacity per hole

Cable type	Ø 4.4	Ø 5.5	Ø 7	Ø 8.5
Rigid or semi-rigid	1.5.... 10 mm ²	2.5.... 16 mm ²	4.... 25 mm ²	16.... 35 mm ²
Flexible without end	1.5.... 6 mm ²	4.... 10 mm ²	6.... 16 mm ²	25 mm ²
Flexible with end	1.5.... 6 mm ²	1.5.... 10 mm ²	2.5.... 16 mm ²	10.... 25 mm ²

Nota: ends to be crimped: refer to the Telemecanique offers AZ5, DZ5, etc.

Neutral bar

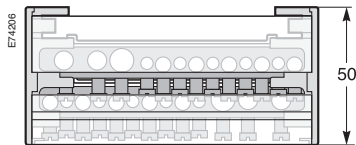
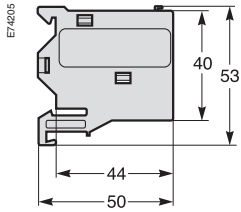
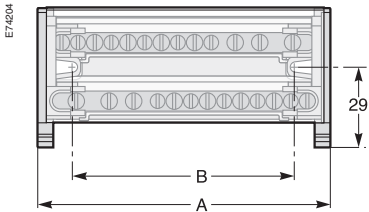
To increase the number of neutral terminals, an additional neutral bar can be attached to the 4-pole terminal blocks **without increasing terminal block volume**. This bar is clipped on without tools; cut-outs need to be made in the cover in order to connect the cables (only from the top).

Catalogue numbers

100 to 125 A stepped 2-pole splitter block	
100 A (2 x 7 holes)	13506
125 A (2 x 13 holes)	13507
40 to 125 A stepped 4-pole splitter block	
40 A (4 x 13 holes)	13508
100 A (4 x 7 holes)	13510
125 A (4 x 13 holes)	13512
125 A (4 x 17 holes)	13514
Additional neutral bar	
40 A (for splitter block 13508)	13516
100 A (for splitter block 13510)	13515
125 A (for splitter block 13512)	13517
125 A (for splitter block 13514)	13518

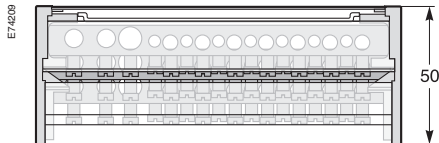
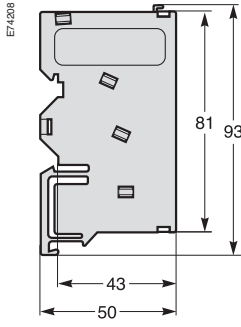
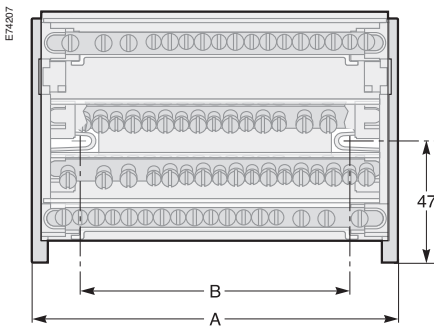
40 to 125 A stepped splitter blocks

2-pole



	A	B
100 A (7 holes)	62	37
125 A (13 holes)	107	82

4-pole



	A	B
40 A (13 holes)	89	63
100 A (7 holes)	62	37
125 A (13 holes)	107	82
125 A (17 holes)	134	109

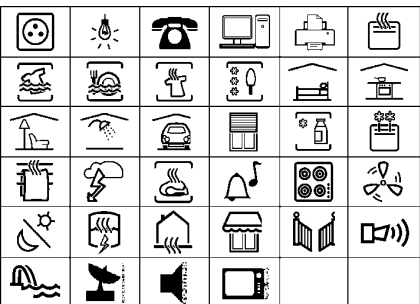
Multi 9 Printer

Label and identify cables and other equipment (low-voltage devices, VDI, etc.)

PS101365



DB109160



34 pictograms are available (functions, locations, etc.).

Function

Multi 9 Printer is a thermal-tape label-maker (180 dpi) intended for contractors, installers, panel builders, etc., to identify wires and cables, switchboards, modular components, enclosures, etc. .

Labels can be printed in different font sizes and styles.

The printer can produce pictograms, text, numbers, barcodes, etc. .

Description

The Multi 9 Printer is supplied in a carrying case containing:

- 1 Multi 9 Printer
- 1 power adapter (230 V)
- 1 rechargeable battery
- 4 tapes (cat. no. 13494, 13495, 13496, 13497).

Characteristics

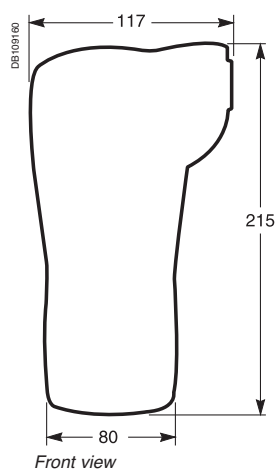
Multi 9 Printer	13501
LCD screen	
99 characters	■
Battery-charge indication	■
Back-lit screen	■
Multi-language (latin characters)	■
Power supply ⁽¹⁾	
230 V adapter	■
Rechargeable battery	■
Automatic power down (after five minutes)	■
Operating characteristics	
Operating conditions	+ 4°C to + 40°C, relative humidity 0 % - 90 %
Storage conditions	0°C to +90°C, relative humidity 10 % - 90 %
Cutting blade	■
Accessories ⁽²⁾	
White polypropylene tape, 19 mm, non-adhesive	13494
White polyester tape, 12 mm, adhesive	13495
White polyester tape, 19 mm, adhesive	13496
Yellow vinyl tape, 19 mm, adhesive	13497

(1) Can also operate with six AA batteries (not supplied).

(2) Tapes are also available in other materials and sizes (www.dymo.com).

Dimensions

Weight: 0.512 kg

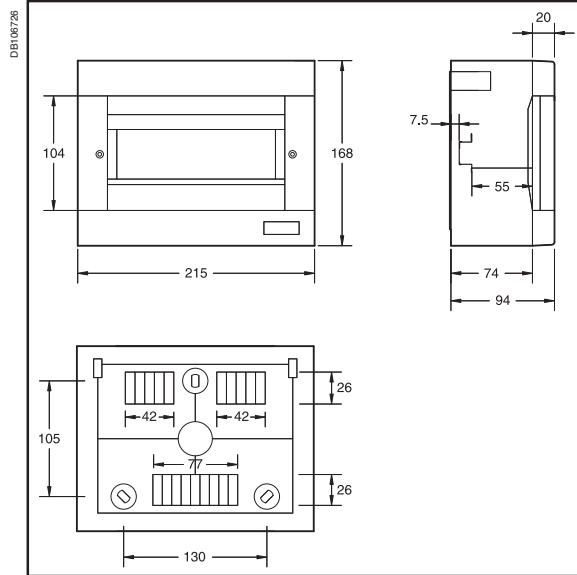


Front view

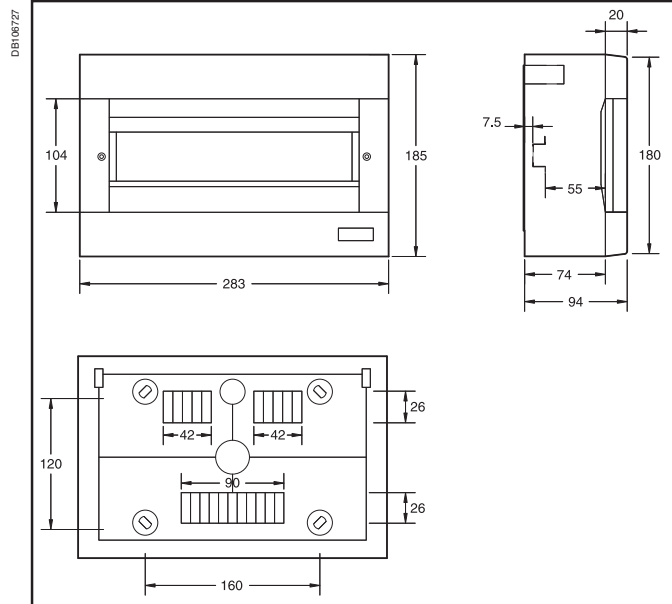


Side view

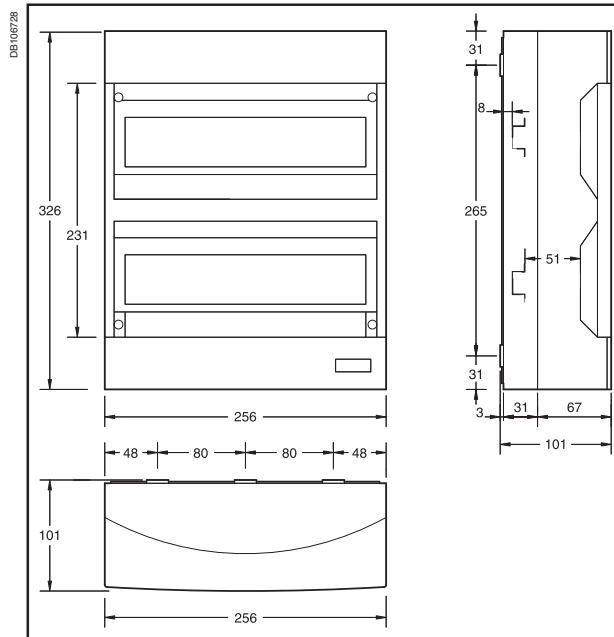
Surface mounting Mini Pragma L
1 row 8 modules



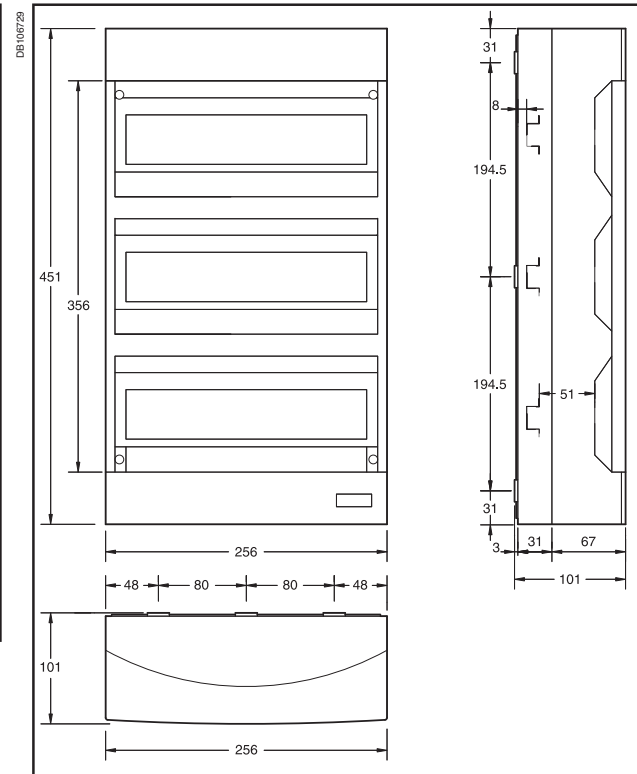
1 row 12 + 1 modules



Surface mounting Mini Pragma L
2 rows 24 modules

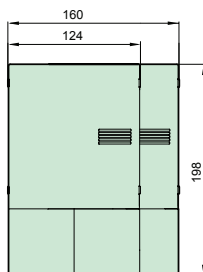


3 rows 36 modules

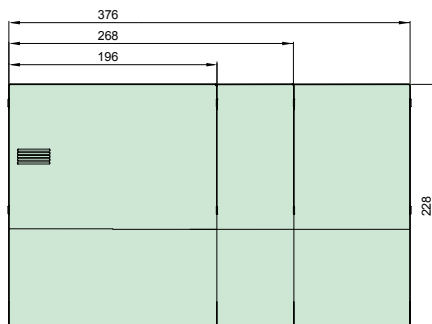


DB12738

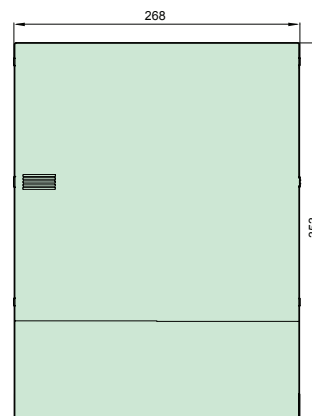
Front view



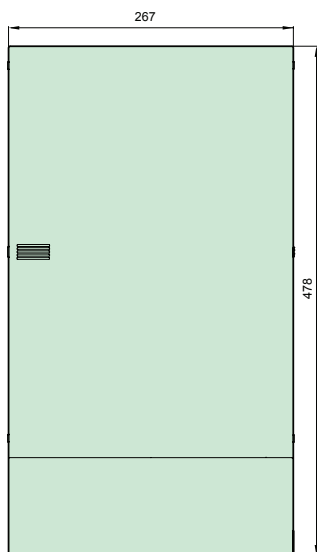
4, 6 modules



8, 12, 18 modules

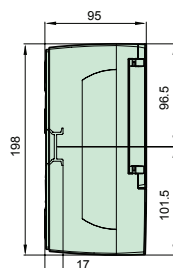


24 modules

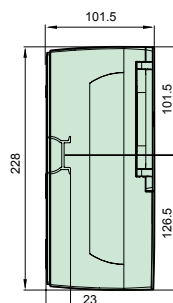


36 modules

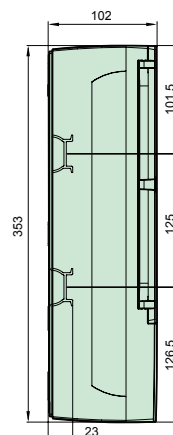
Side view



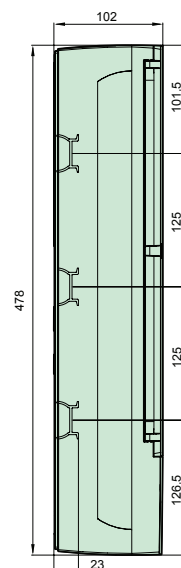
4, 6 modules



8, 12, 18 modules



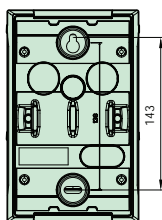
24 modules



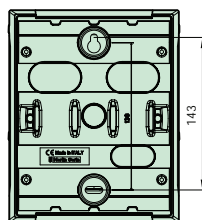
36 modules

DB122759

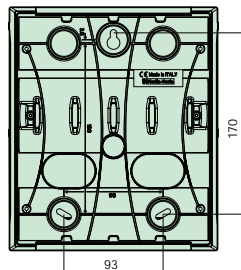
Inside view



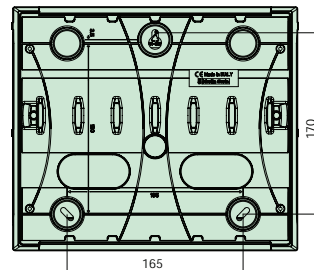
4 modules



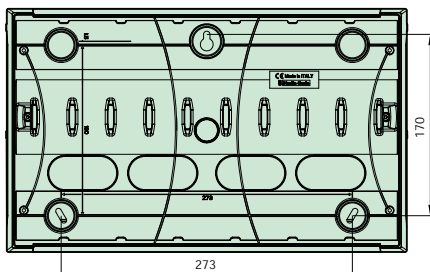
6 modules



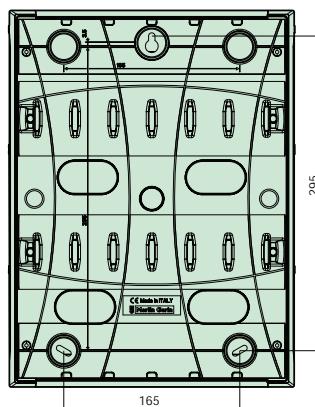
8 modules



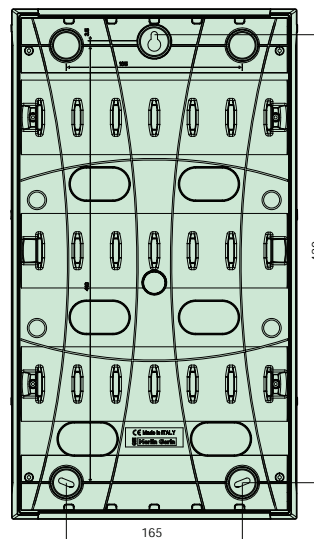
12 modules



18 modules



24 modules

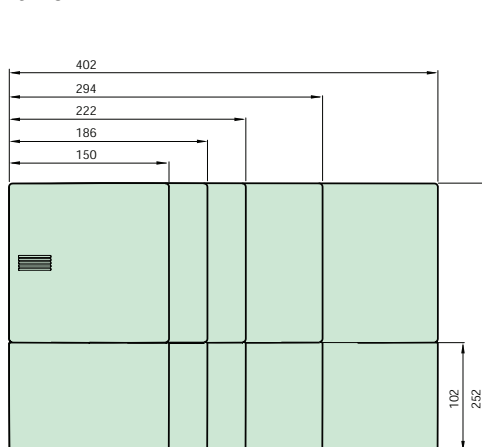


36 modules

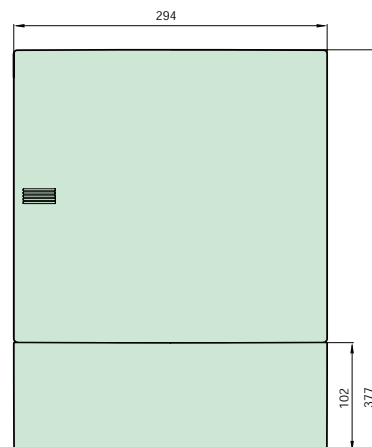
Mini Pragma

Flush mounting enclosures

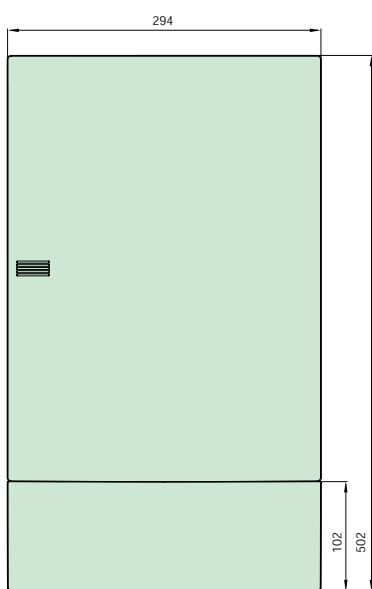
Front view



4, 6, 8, 12, 18 modules

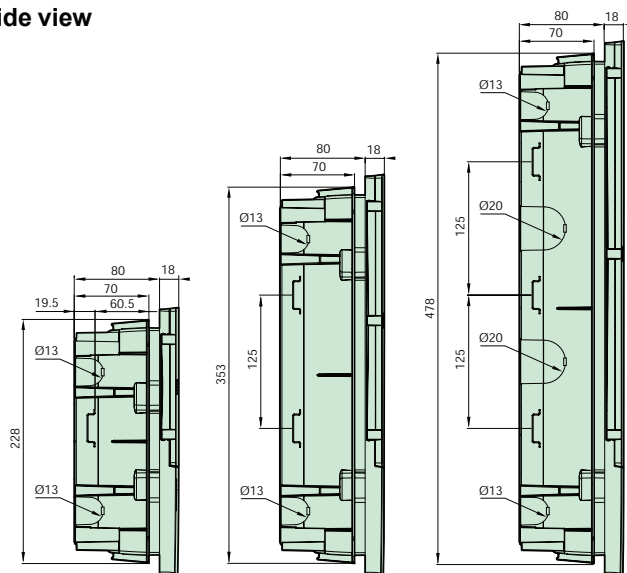


24 modules



36 modules

Side view

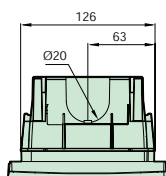


4, 6, 8, 12, 18 modules

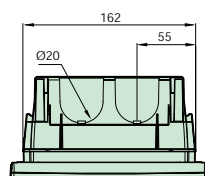
24 modules

36 modules

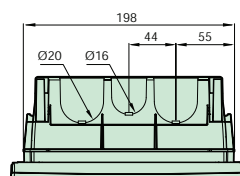
Top view



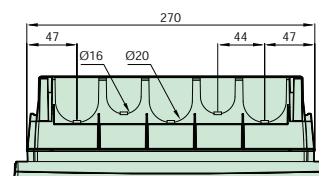
4 modules



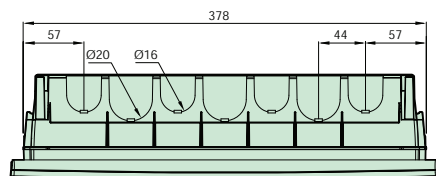
6 modules



8 modules

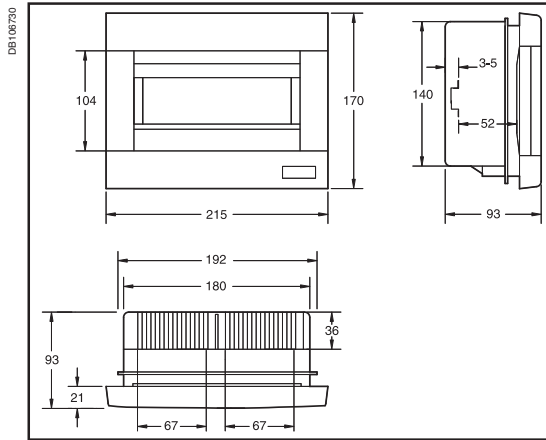


12, 24, 36 modules

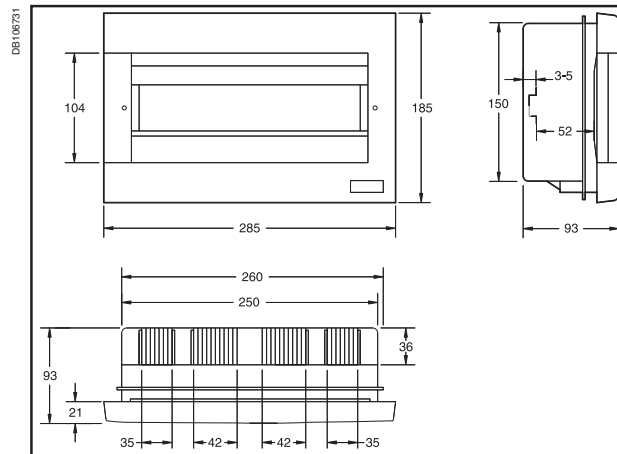


18 modules

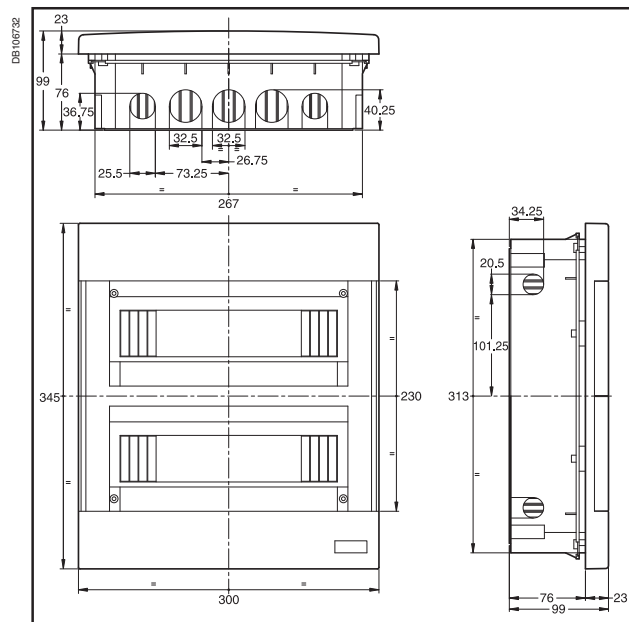
Flush mounting Mini Pragma L
1 row 8 modules



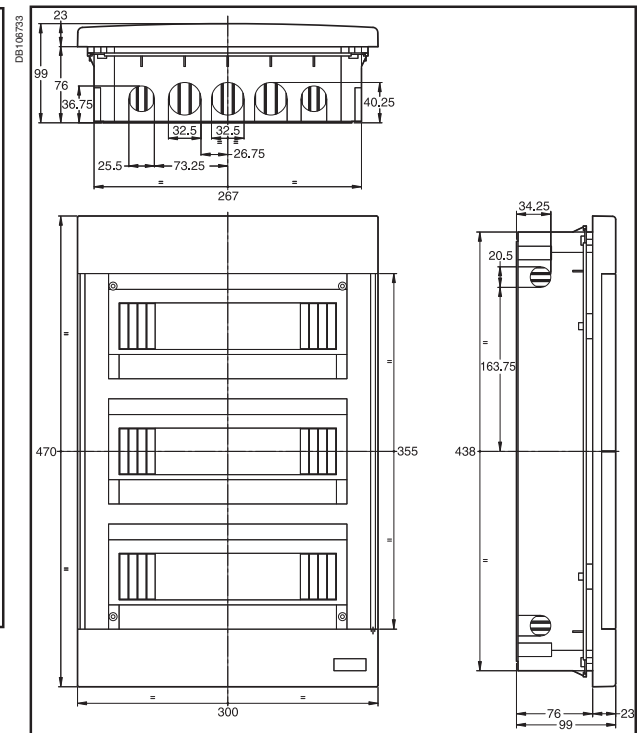
1 row 12 + 1 modules



Flush mounting Mini Pragma L
2 rows 24 modules



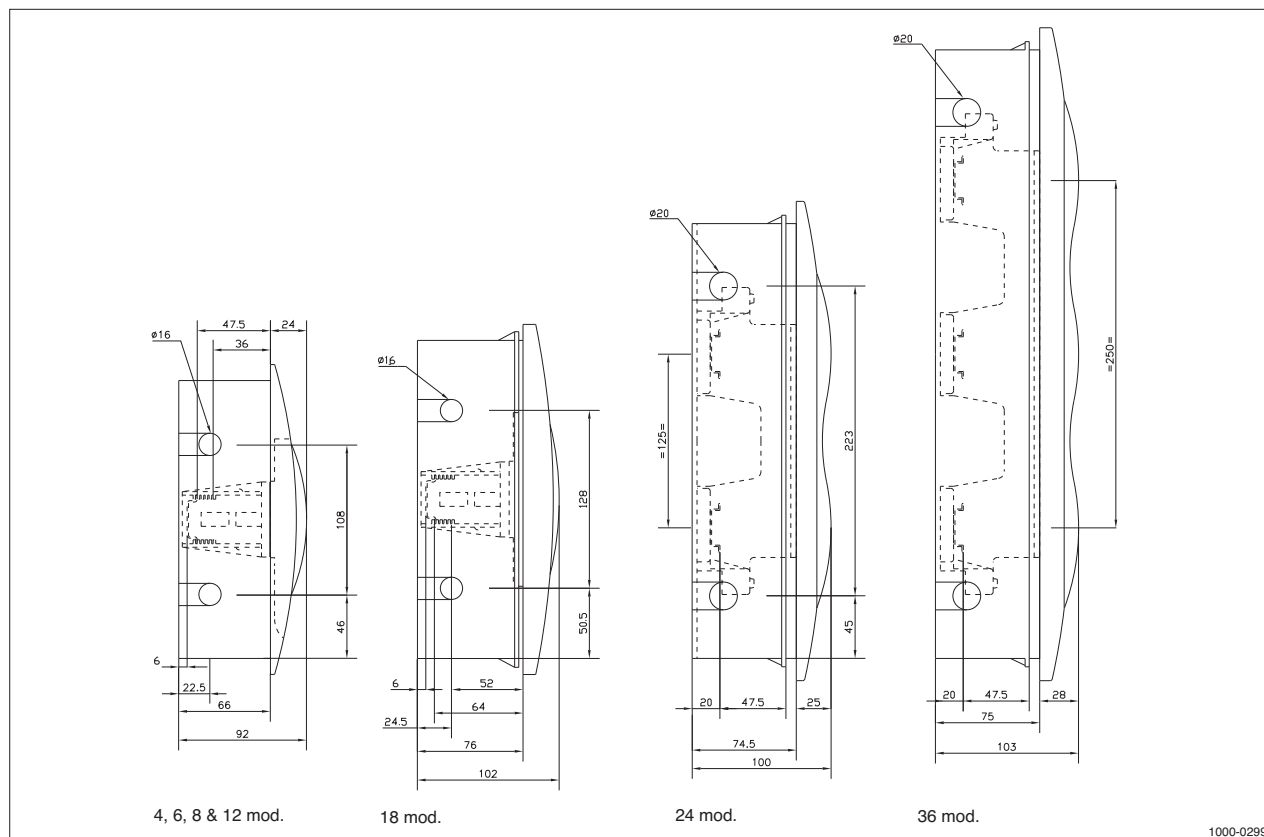
3 rows 36 modules



Mini Pragma dimensions

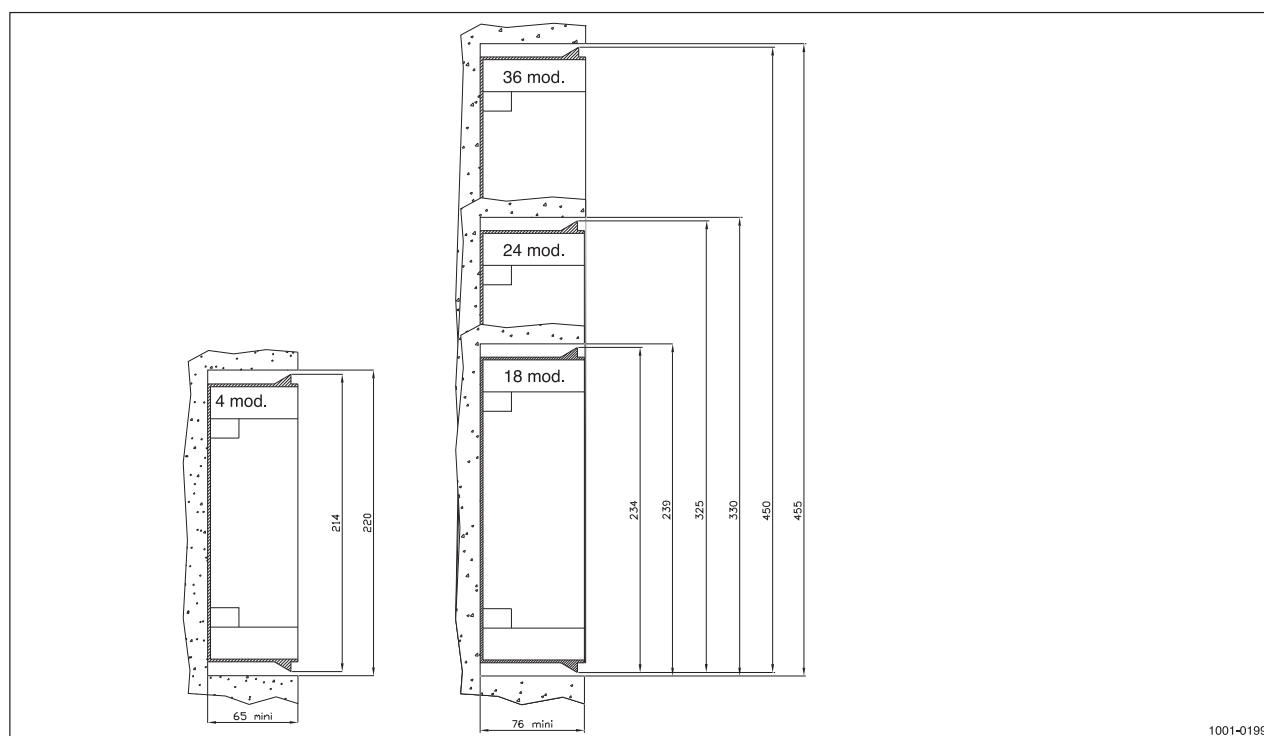
Flush mounting Mini Pragma L

Side view



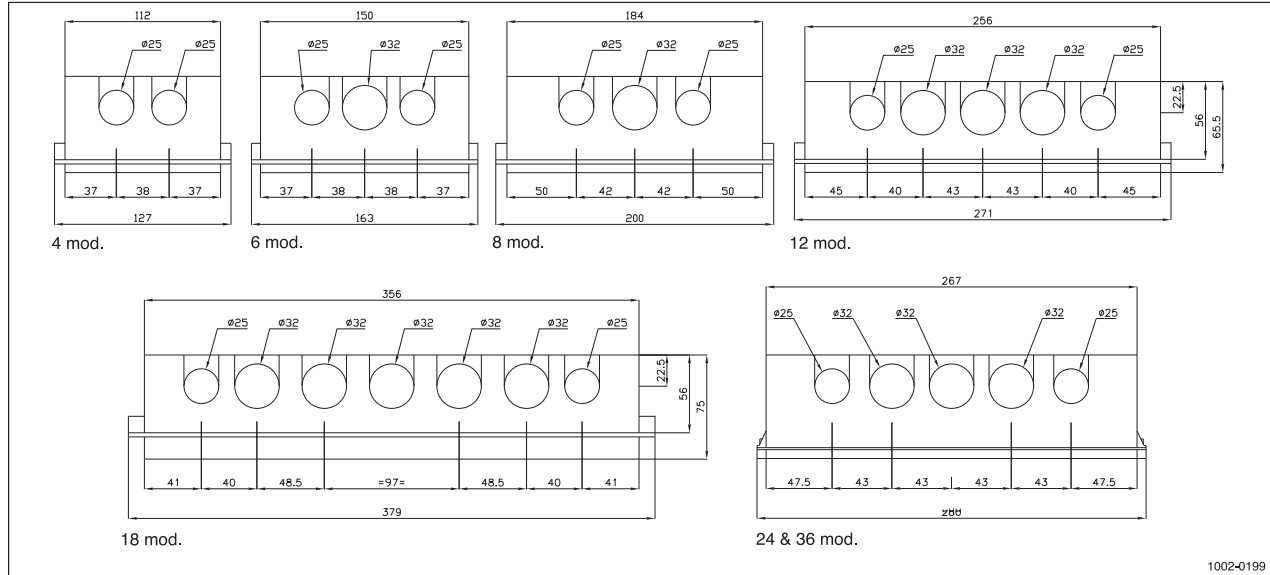
1000-0299

Flush mounting

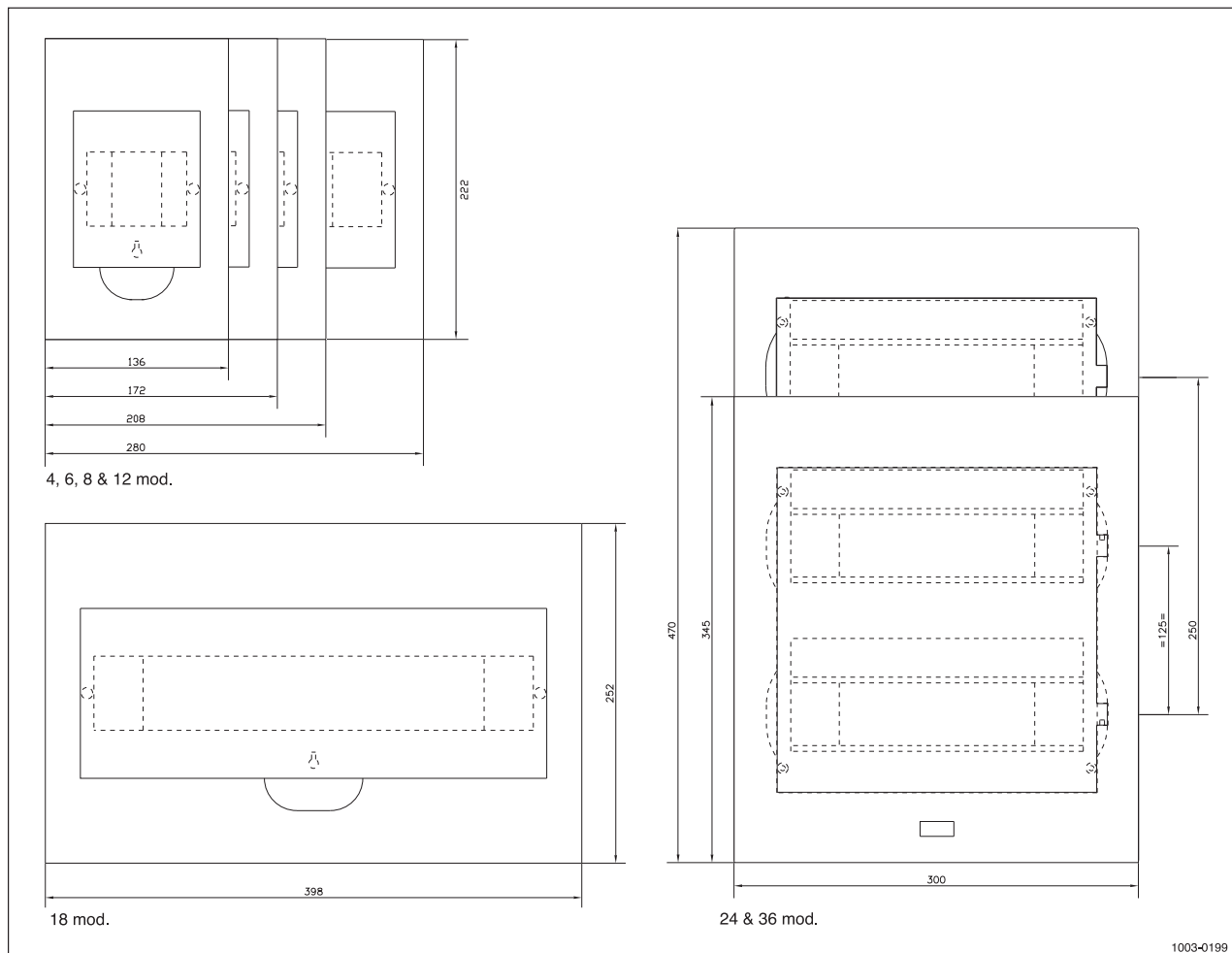


1001-0199

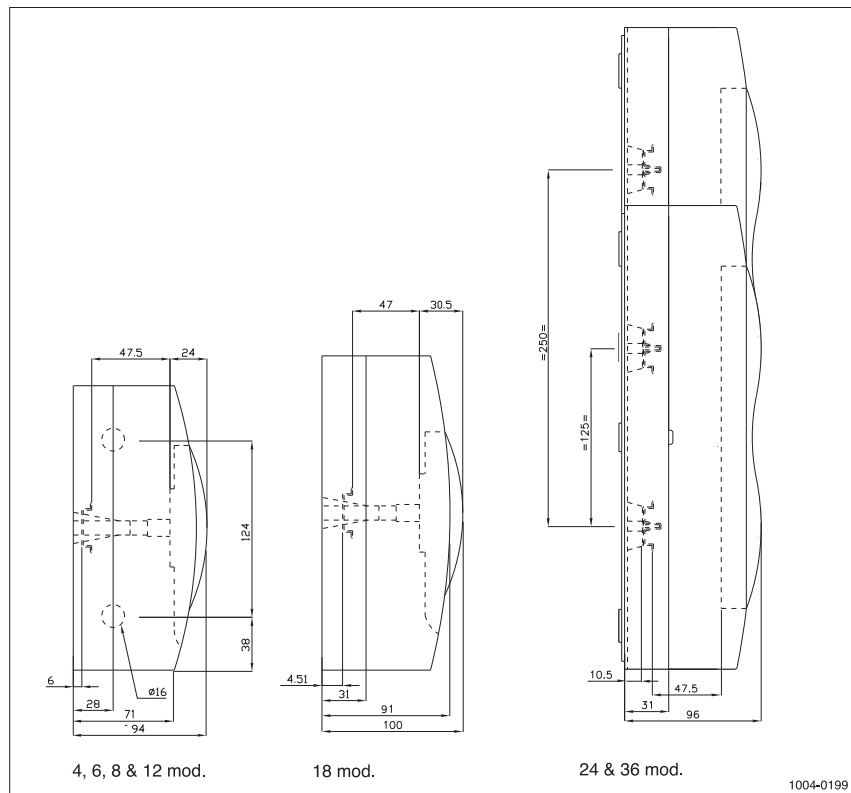
Flush mounting Mini Pragma (cont)
Top view



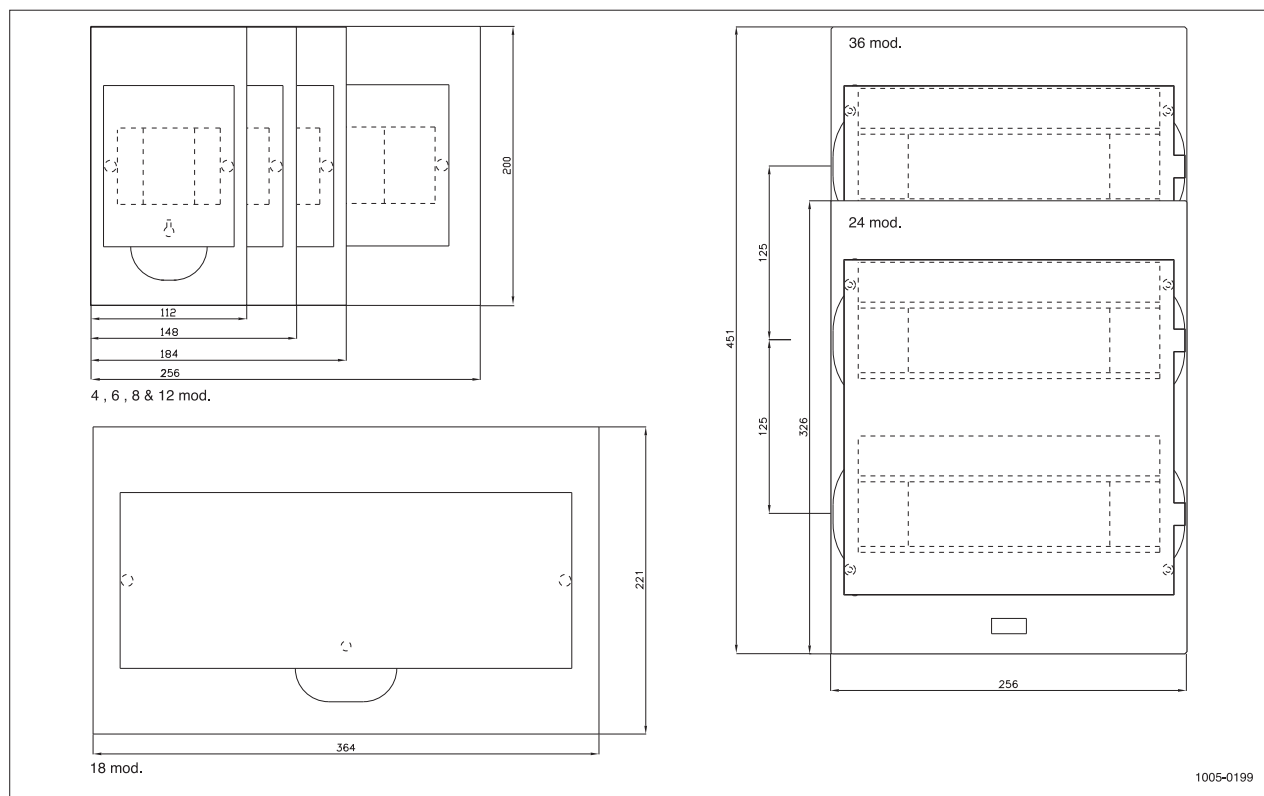
Front view



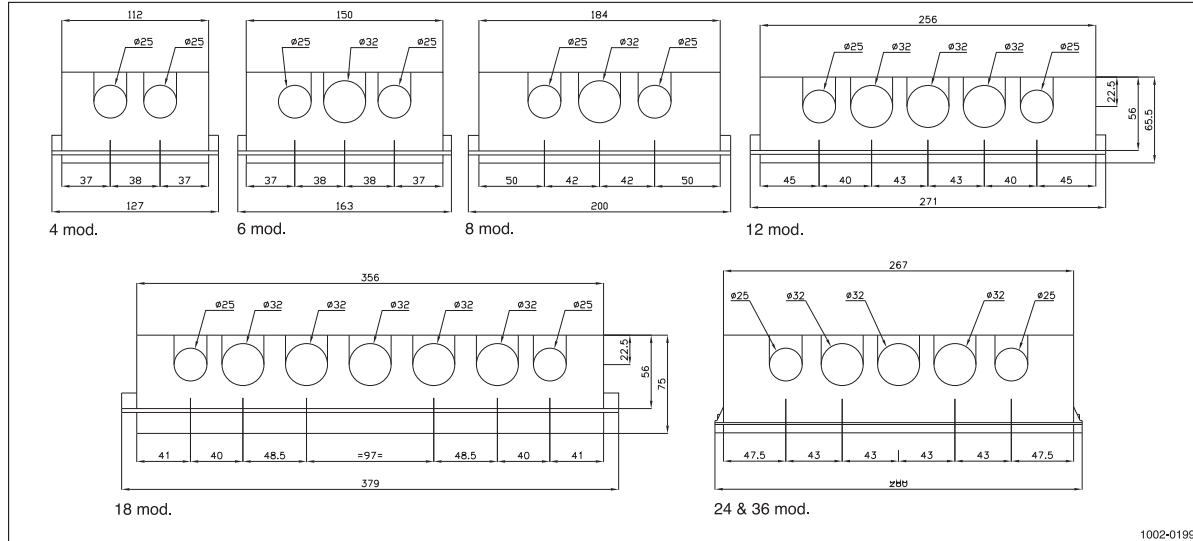
Surface mounting Mini Pragma
Side view



Front view

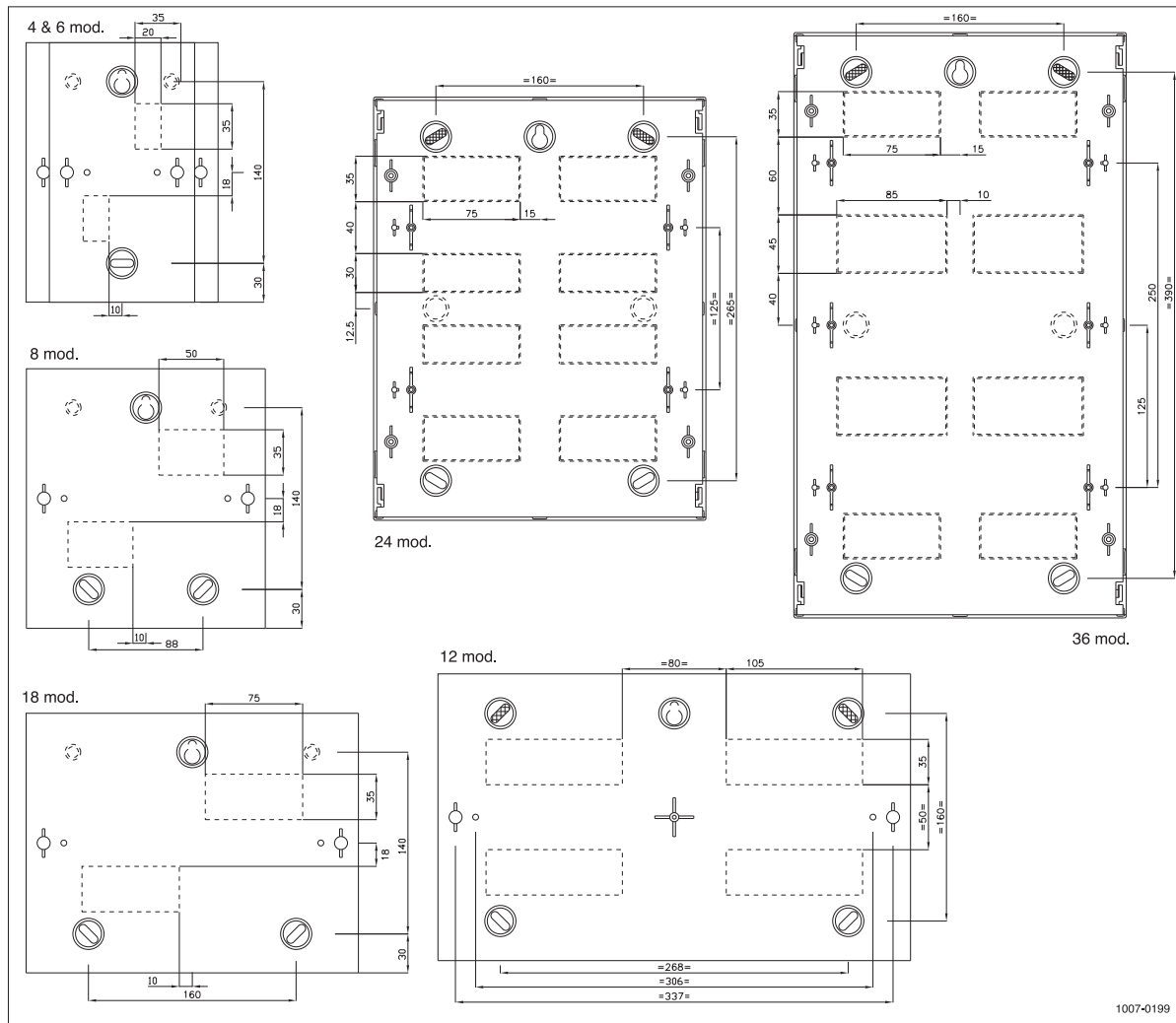


Surface mounting Mini Pragma (cont.)
Top view



1002-0199

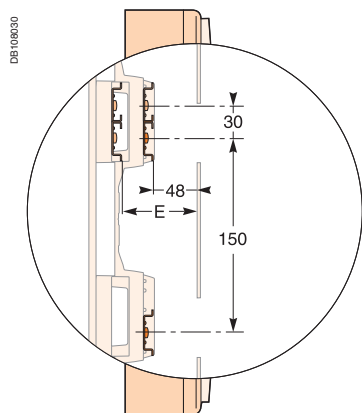
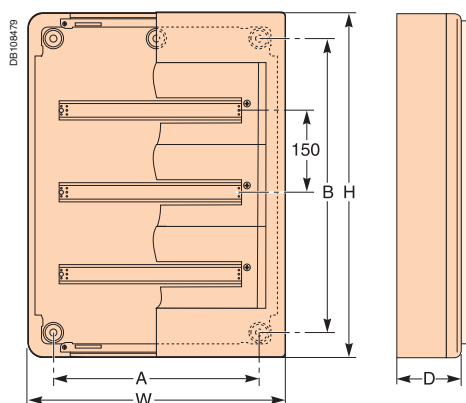
Back view



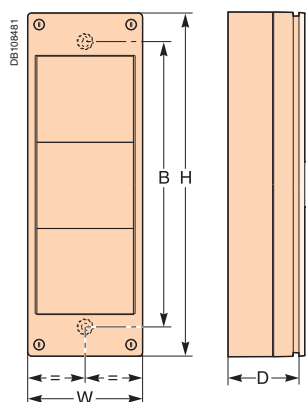
1007-0199

Pragma

Dimensions of surface-mounted enclosures and interfaces



The different positions of the DIN rail in height and depth.

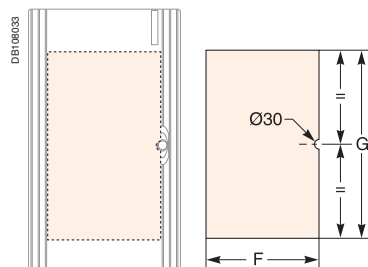


Surface-mounted enclosures

Enclosures		Dimensions (mm)								
		H	W	D	A	B	E	F	G	J
13 modules	1 R	300	336	123	160	200	73	193	149	
	2 R	450				350				
	3 R	600				500				
	4 R	750				650				
18 modules	1 R	300	426	125	250	200	73	343	149	
	2 R	450				350				
	3 R	600				500				
	4 R	750				650				
24 modules	1 R	300	550	148	340	150	84			121
	2 R	450				300				271
	3 R	600				450				421
	4 R	750				600				571
	5 R	900				750				721
	6 R	1050				900				871

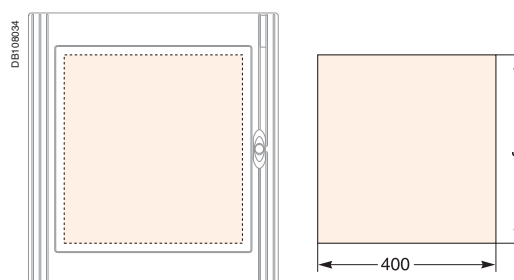
Panel for customisation of the transparent door

13- and 18-module enclosures



Panel thickness: 0.5 mm max.

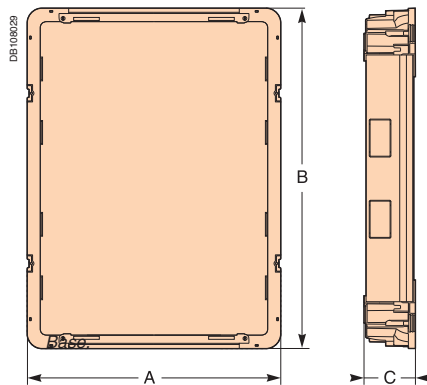
24-module enclosures



Panel thickness: 0.5 mm max.

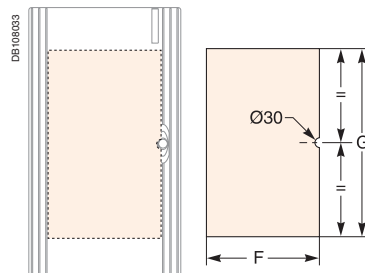
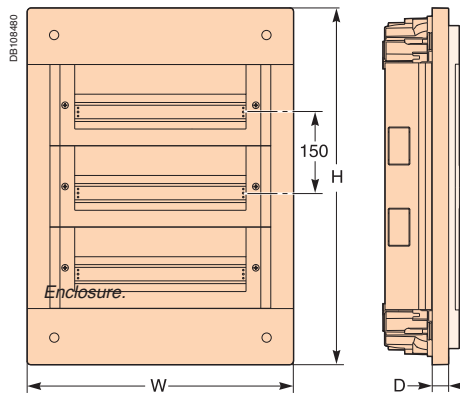
Interfaces

Interfaces		Dimensions (mm)			
		H	W	D	B
1 R	13 modules	300	200	123	260
2 R	18 modules	450			410
3 R		600			560
1 R	24 modules	300	200	125	260
2 R		450			410
3 R		600			560



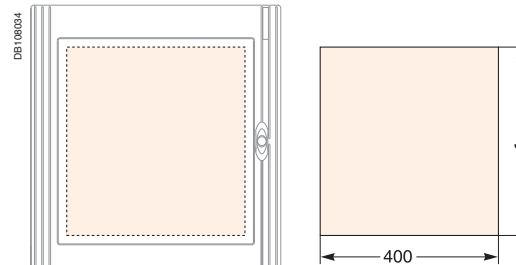
Enclosures		Dimensions (mm)									
		H	W	D	A	B	C	E	F	G	J
13 modules	1 R	360	396	21	366	330	86	67	193	149	
	2 R	510				480				299	
	3 R	660				630				449	
	4 R	810				780				599	
18 modules	1 R	360	486	23	456	330	86	67	343	149	
	2 R	510				480				299	
	3 R	660				630				449	
	4 R	810				780				599	
24 modules	1 R	360	610	30	570	330	95	73			121
	2 R	510				480					271
	3 R	660				630					421
	4 R	810				780					571
	5 R	960				930					721
	6 R	1110				1080					871

Panel for customisation of the transparent door 13- and 18-module enclosures



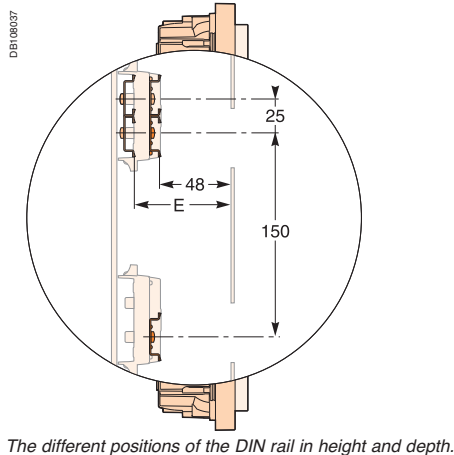
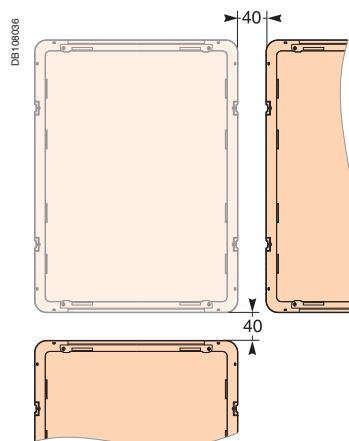
Panel thickness: 0.5 mm max.

24-module enclosures



Panel thickness: 0.5 mm max.

Horizontal and vertical association



The different positions of the DIN rail in height and depth.

Kaedra

Dimensions and weights

Pre-cutouts

The new European standard EN 50262 generalises metric dimensions for cable glands.

To simplify the transition, the entire Kaedra range is equipped with pre-cutouts both in ISO/metric standardisation and in PG standardisation. Each pre-cutout is marked:

- simple pre-cutout adapted to the metric cable gland:



- double pre-cutout:

- external: pre-cutout adapted to the metric cable gland/ISO
- internal: pre-cutout adapted to the PG cable gland.



Cable glands	
Type of pre-cutout	For cables of diameter (mm)
M16	4 - 8
M20	6 - 12
M25	12 - 18
M32	18 - 25
M50	30 - 38
PG11	5 - 10
PG16	10 - 14
PG21	14 - 17
PG29	19 - 26
PG36	22 - 32

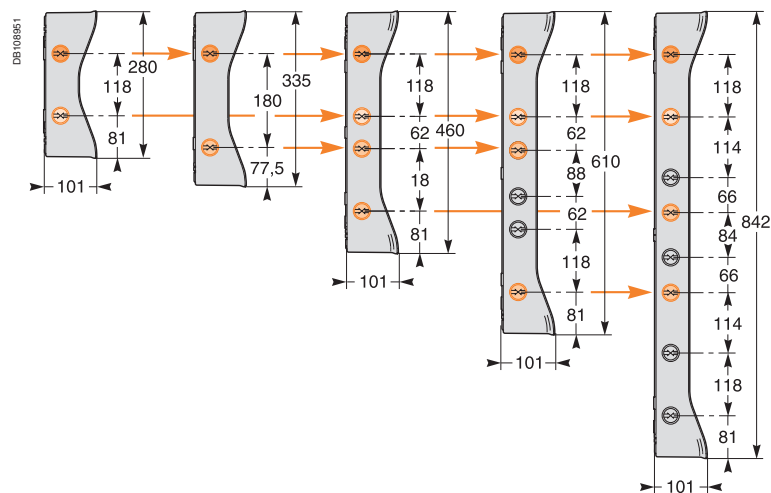
Associations

The enclosures can be associated:

- horizontally, regardless of their height (see diagram below)
- vertically, if their width is identical.

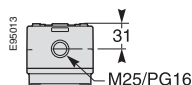
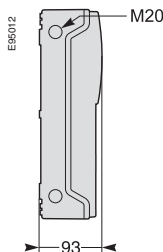
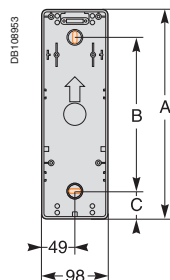
Use the association kit, cat. no. 13934 (2 sleeves + 4 nuts + 4 seals) in the M32 pre-cutouts marked with a double arrow.

Insertion of cables between the enclosures is possible, while preserving the degree of protection IP65.



Weatherproof mini enclosures

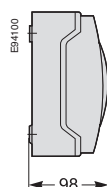
Weatherproof mini enclosures for power outlets



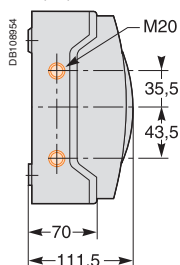
A	B	C	Weight (g)
248	166	41	550
310	228	41	600
392	310	41	700

Weatherproof mini enclosures for modular switchgear

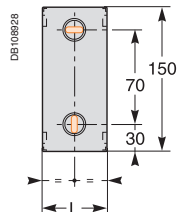
3 modules



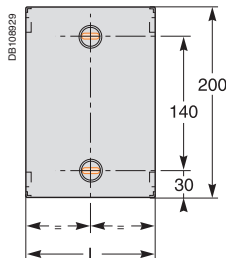
4, 6, 8 and 12 modules



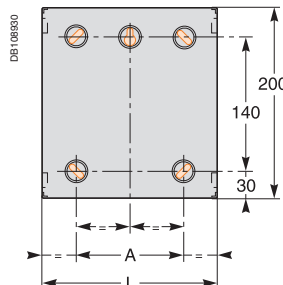
3 modules



4 and 6 modules

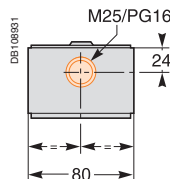


8 and 12 modules

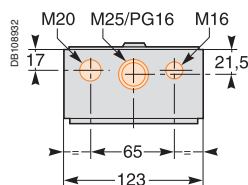


Number of modules	A	L	Weight (g)
3	-	80	300
4	-	123	500
6	-	159	650
8	88	195	850
12	160	267	1050

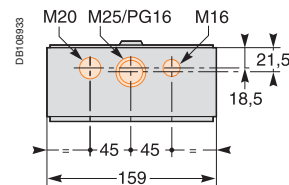
3 modules



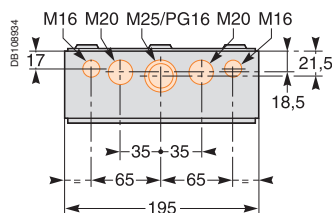
4 modules



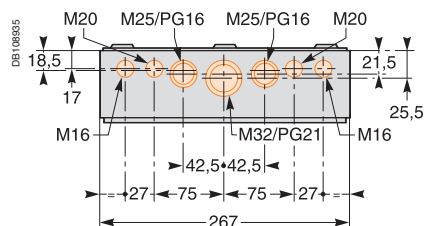
6 modules



8 modules

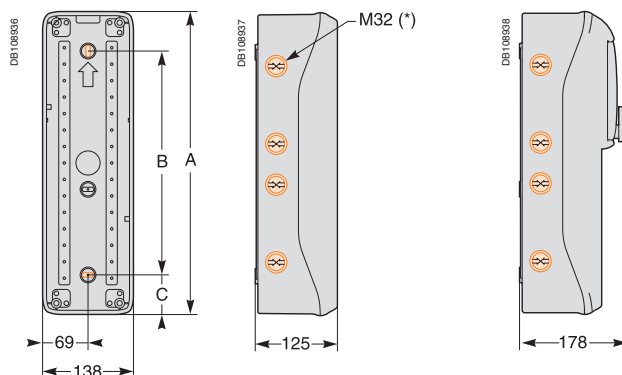


12 modules

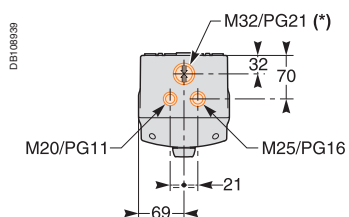


Weatherproof enclosures

5 modules

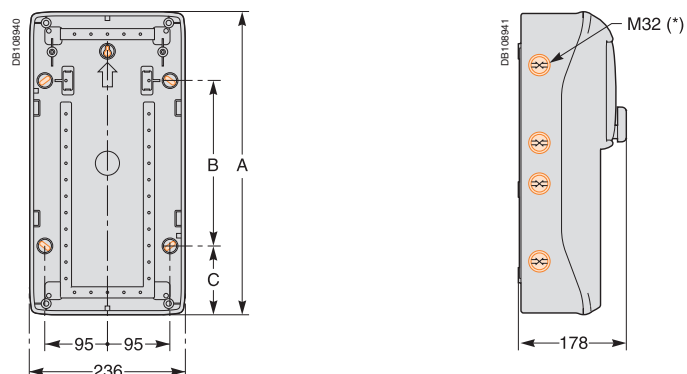


A	B	C	Weight (g)
460	251	104,5	1450
460	251	104,5	1250
460	251	104,5	1400
460	251	104,5	1400
610	490	60	1650

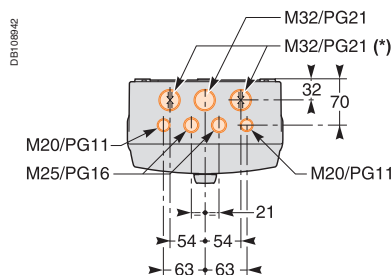


(*) pre-punchout also used for enclosure association

8 modules



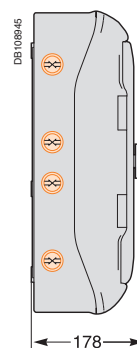
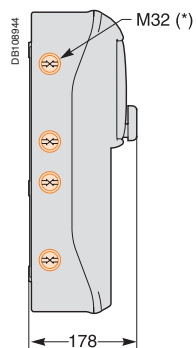
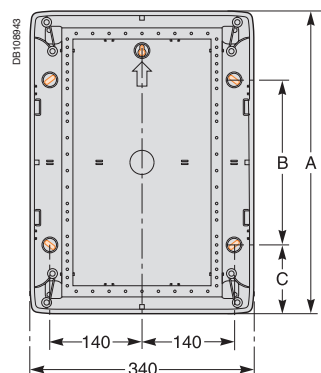
A	B	C	Weight (g)
460	251	104,5	2050
460	251	104,5	1900
460	251	104,5	1900



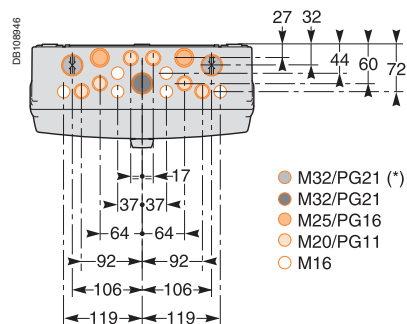
(*) pre-punchout also used for enclosure association

Weatherproof enclosures

12-13 modules

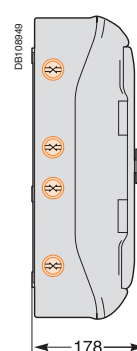
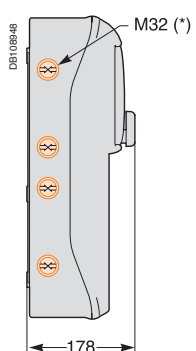
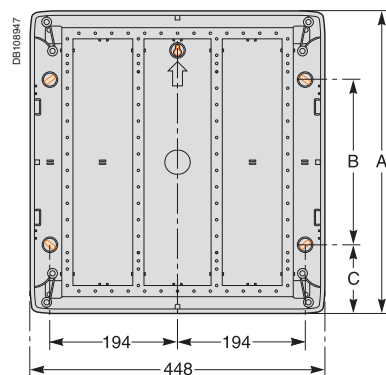


A	B	C	Weight (g)
280	118	81	1900
335	170	82,5	2200
335	170	82,5	2150
460	251	104,5	3100
460	251	104,5	2850
460	251	104,5	3300
460	251	104,5	2650
460	251	104,5	2700
610	401	104,5	4100
460	251	104,5	4550

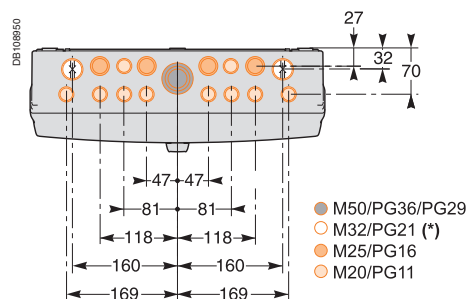


(*) pre-punchout also used for enclosure association

18-19 modules



A	B	C	Weight (g)
280	118	81	2400
280	118	81	1950
460	251	104,5	3850
460	251	104,5	3550
460	251	104,5	4150
460	251	104,5	3200
460	251	104,5	3150
460	251	104,5	3300
610	401	104,5	3150
610	401	104,5	5600
610	401	104,5	4050
842	633	104,5	6500
842	633	104,5	6600



(*) pre-punchout also used for enclosure association

Complementary Technical Information

F Complementary Technical Information

Chapter I

Circuit breakers

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Surge arresters

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Tripping Curves

C60 circuit-breaker

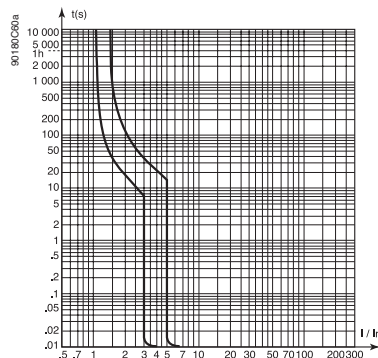
B, C and D curves, as in standard EN 60898

The operating range of the magnetic release is as follows:

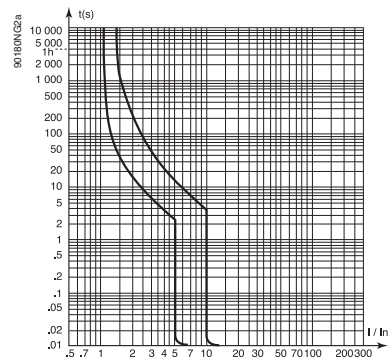
- for B curve: between $3 I_n$ and $5 I_n$
- for C curve: between $5 I_n$ and $10 I_n$
- for D curve: between $10 I_n$ and $14 I_n$

The curves show the cold thermal tripping limits when poles are charged and the electromagnetic tripping limits with 2 charged poles.

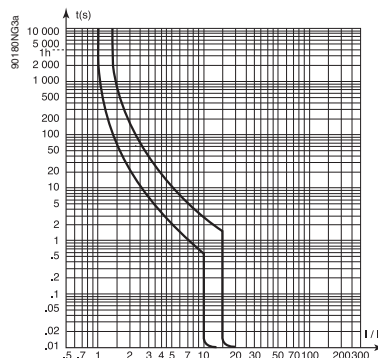
C60 B curve



C60 C curve



C60 D curve



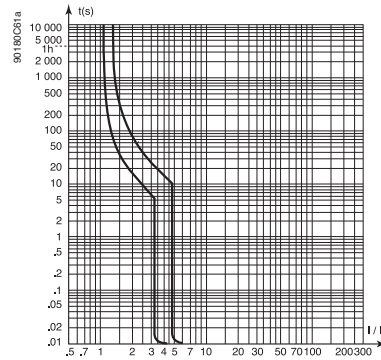
C60 circuit-breaker

B, C, D, K, Z and MA curves, as in standard IEC 60947.2

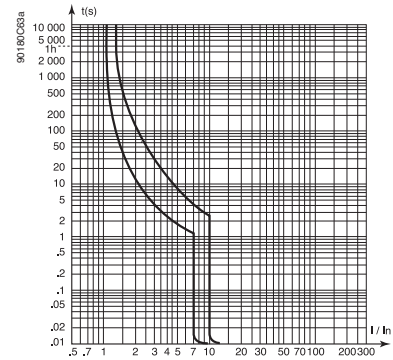
The operating range of the magnetic release is as follows:

- for B curve: between $3.2 I_n$ and $4.8 I_n$
 - for C curve: between $7 I_n$ and $10 I_n$
 - for D curve: between $10 I_n$ and $14 I_n$
 - for K curve: between $10 I_n$ and $14 I_n$
 - for Z curve: between $2.4 I_n$ and $3.6 I_n$
 - for MA curve: between $9.6 I_n$ and $14.4 I_n$
- The curves show the cold thermal tripping limits when poles are charged and the electromagnetic tripping limits with 2 charged poles.

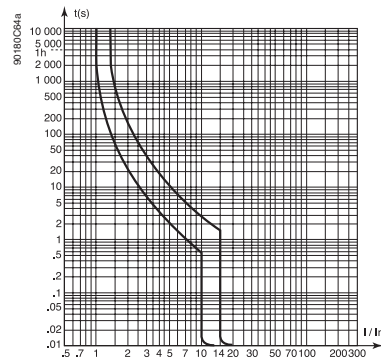
C60 B curve



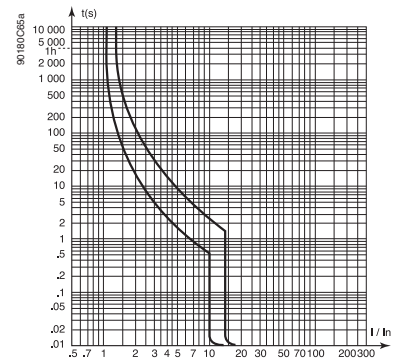
C60 C curve



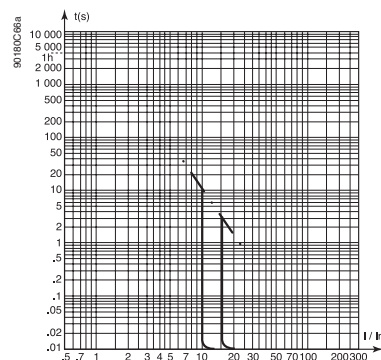
C60 D curve



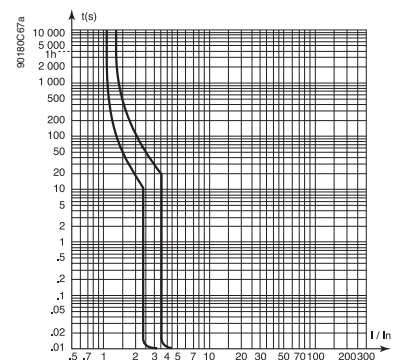
C60 K curve



C60LMA MA curve



C60 Z curve



Tripping Curves

C120N, H circuit-breaker

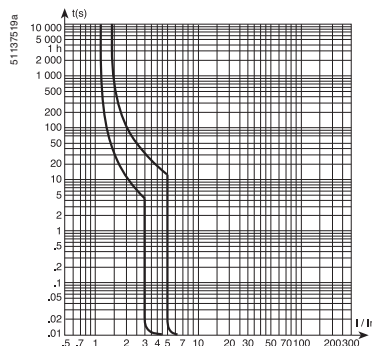
B, C and D curves, as in standard EN 60898

The operating range of the magnetic release is as follows:

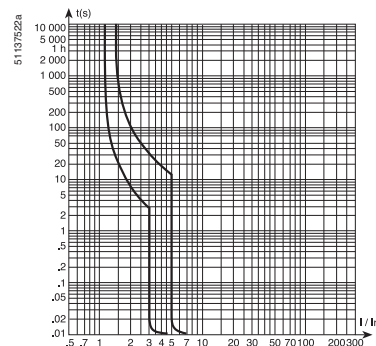
- for B curve: between $3 I_n$ and $5 I_n$
- for C curve: between $5 I_n$ and $10 I_n$
- for D curve: between $10 I_n$ and $14 I_n$

The curves show the cold thermal tripping limits when poles are charged and the electromagnetic tripping limits with 2 charged poles.

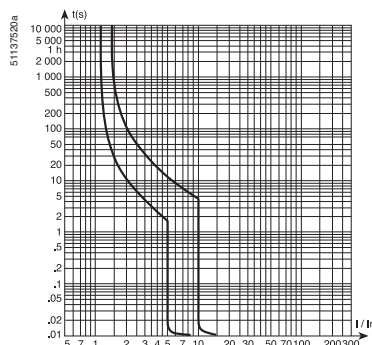
C120N B curve



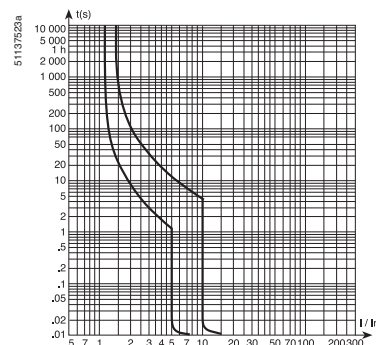
C120H B curve



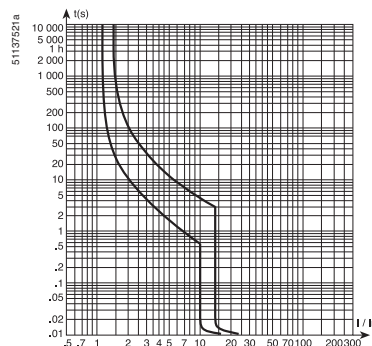
C120N C curve



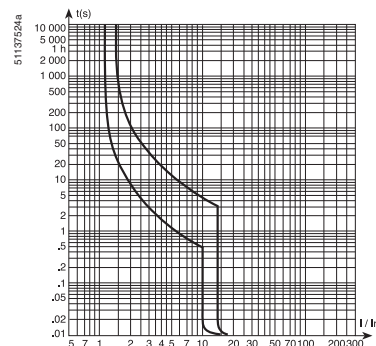
C120H C curve



C120N D curve



C120H D curve



NG125 circuit-breaker

80, 100 and 125 A

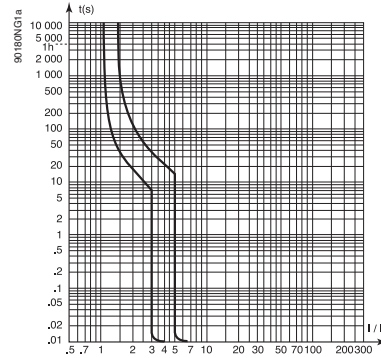
**B, C and D curves,
as in standard IEC 60947.2**

The operating range of the magnetic trip unit is as follows:

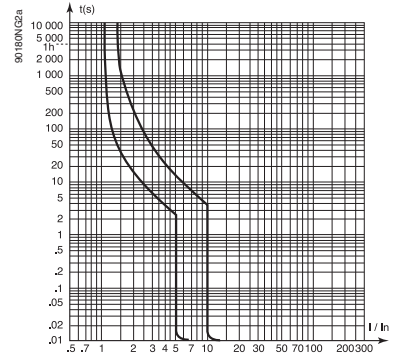
- for B curve: $4 I_n \pm 20\%$
- for C curve: $8 I_n \pm 20\%$
- for D curve: $12 I_n \pm 20\%$
- for MA curve: $12 I_n \pm 20\%$

The curves show the cold thermal tripping limits when poles are charged and the electromagnetic tripping limits with 2 charged poles.

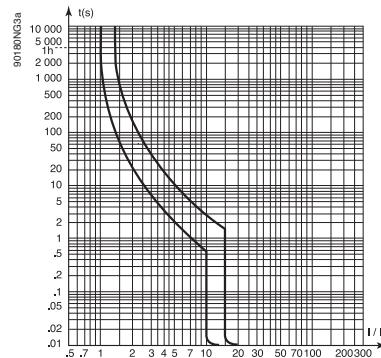
NG125 B curve



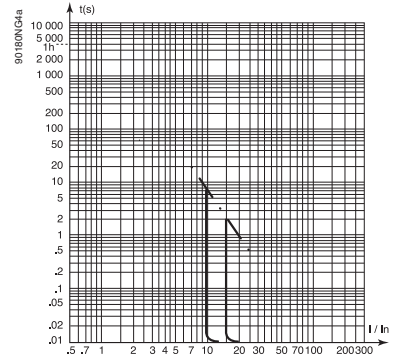
NG125 C curve



NG125 D curve



NG125 MA curve



Tripping Curves

i DPN, i DPN Vigî and DPN Vigî c Breaker

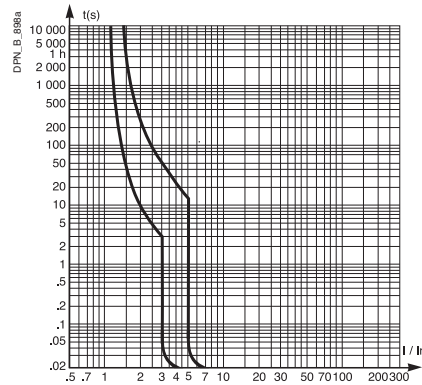
B, C and D curves, as in standard EN 60898

The operating range of the magnetic trip unit is as follows:

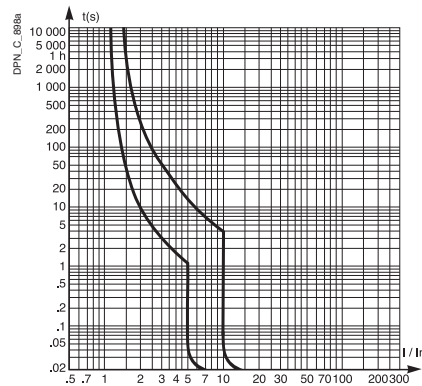
- curve B, between 3 and 5 I_n
- curve C, between 5 and 10 I_n
- curve D, between 10 and 14 I_n

The curves show the cold thermal tripping limits when poles are charged at 30°C ambient temperature

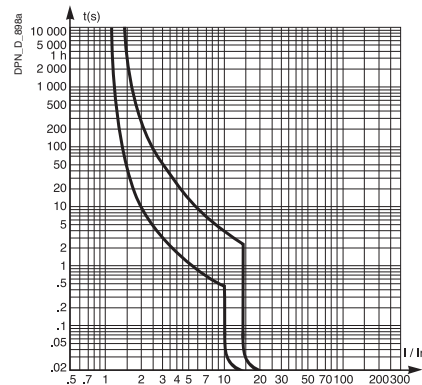
B curve



C curve



D curve

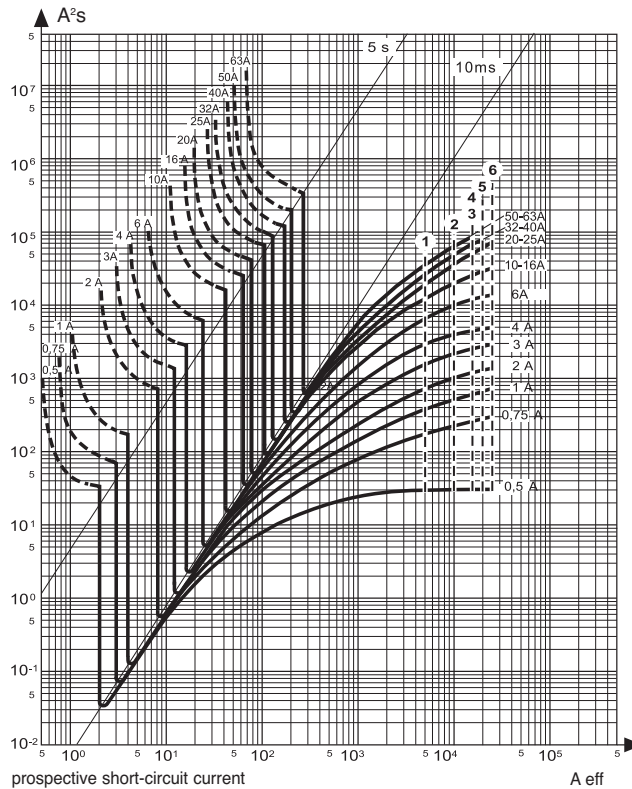


thermal stress limitation

C60a, N, H, L B curve 240/415 V

- Ue:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C60a
 - 2: C60N
 - 3: C60H
 - 4: C60L (50-63 A)
 - 5: C60L (32-40 A)
 - 6: C60L (0.5-25 A)

limited thermal stress

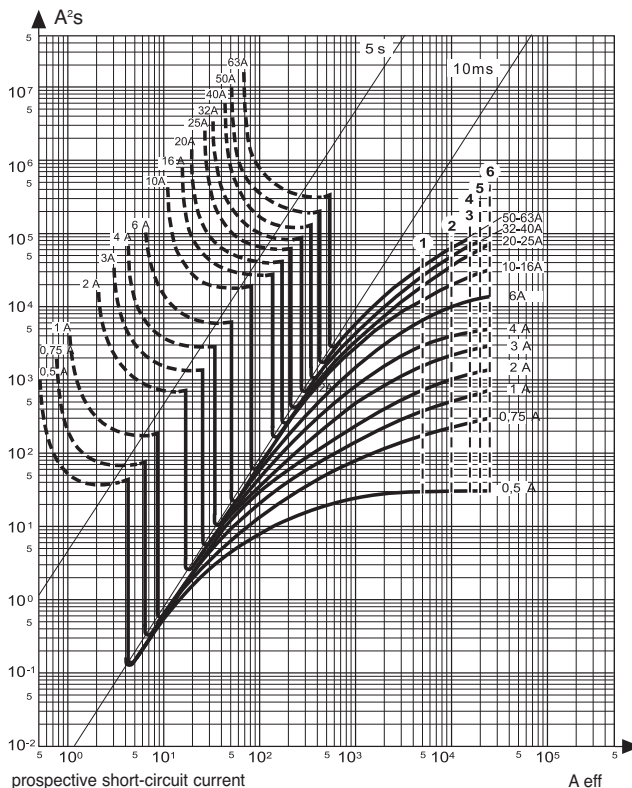


thermal stress limitation

C60a, N, H, L C curve 240/415 V

- Ue:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C60a
 - 2: C60N
 - 3: C60H
 - 4: C60L (50-63 A)
 - 5: C60L (32-40 A)
 - 6: C60L (0.5-25 A)

limited thermal stress



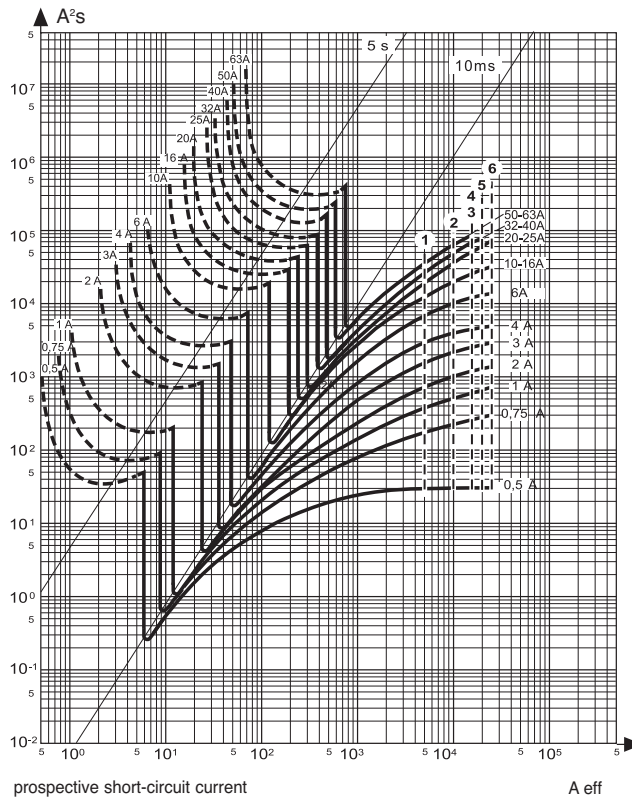
Thermal stress and Peak current limitation curves

thermal stress limitation

C60a, N, H, L D/K curves 240/415 V

- U_e:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C60a
 - 2: C60N
 - 3: C60H
 - 4: C60L (50-63 A)
 - 5: C60L (32-40 A)
 - 6: C60L (0.5-25 A)

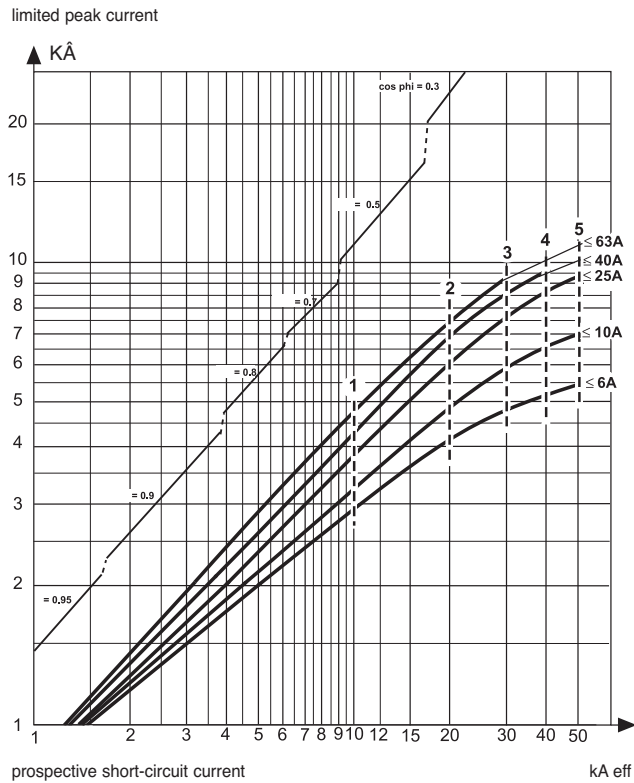
limited thermal stress



peak current limitation

C60a, N, H, L
240 V

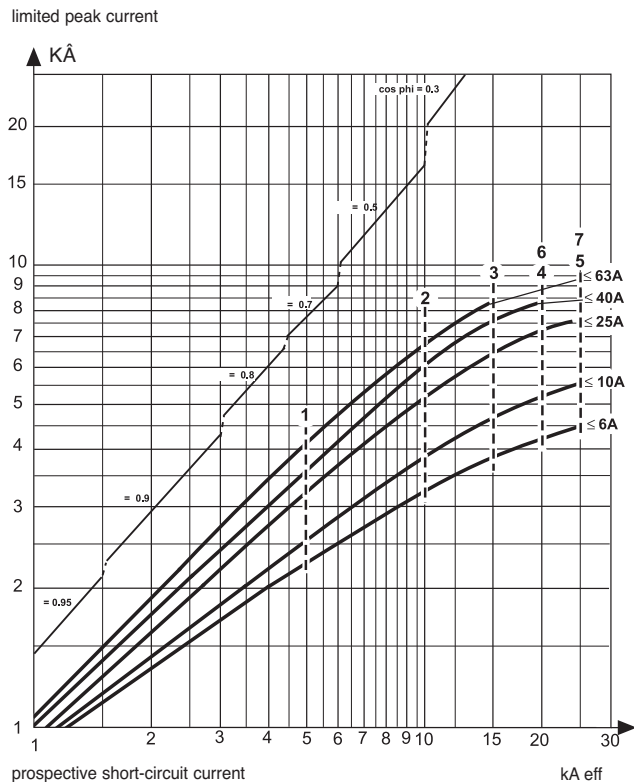
- Ue:
 - 240 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C60a
 - 2: C60N
 - 3: C60H
 - 4: C60L (32-40 A)
 - 5: C60L (1-25 A)



peak current limitation

C60a, N, H, L, LMA
240/415 V

- Ue:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
 - 415 V C60LMA with 2, 3P
- circuit-breaker type in accordance with the mark:
 - 1: C60a
 - 2: C60N
 - 3: C60H, C60L (50-63 A)
 - 4: C60L (32-40 A)
 - 5: C60L (1-25 A)
 - 6: C60LMA (40 A)
 - 7: C60LMA (16-25 A)



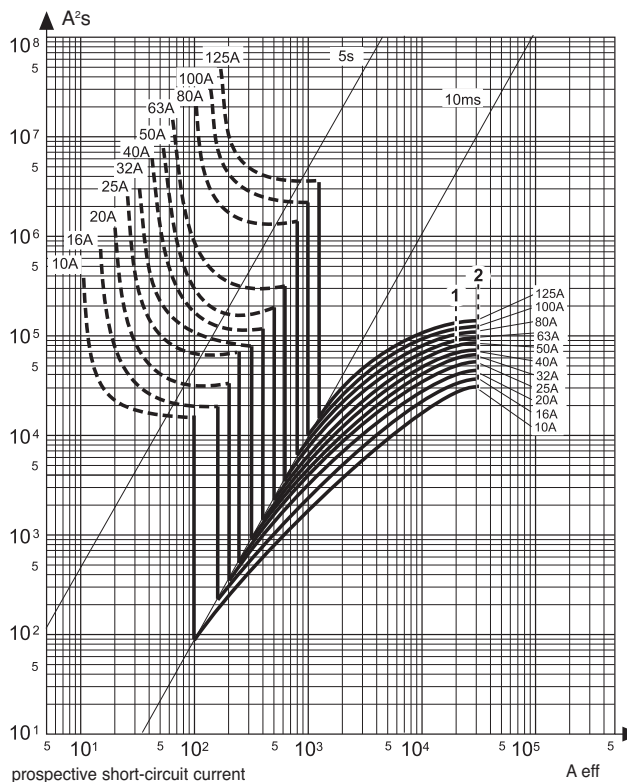
Thermal stress and Peak current limitation curves

thermal stress limitation

C120N, H C curve 240 V

- Ue:
- 240 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
- 1: C120N
- 2: C120H

limited thermal stress

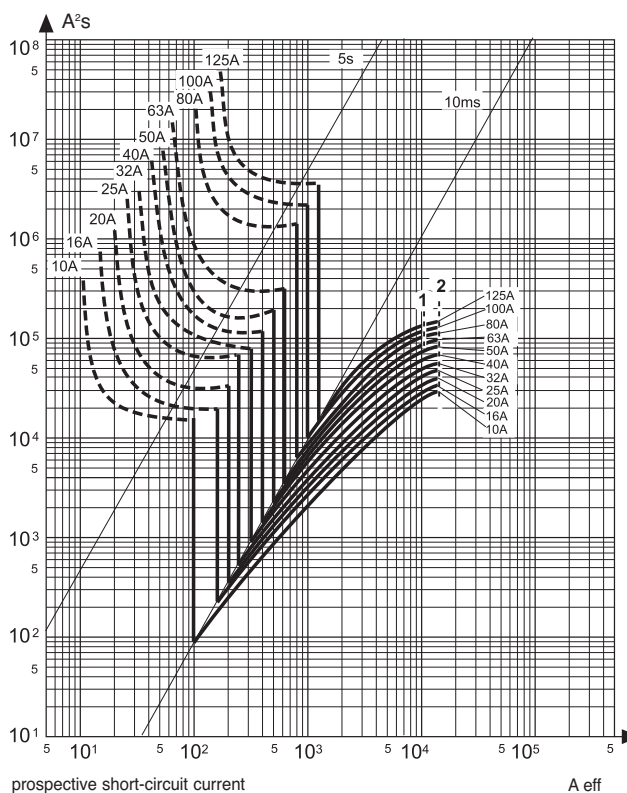


thermal stress limitation

C120N, H C curve 240/415 V

- Ue:
- 240 V with 1P
- 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
- 1: C120N
- 2: C120H

limited thermal stress

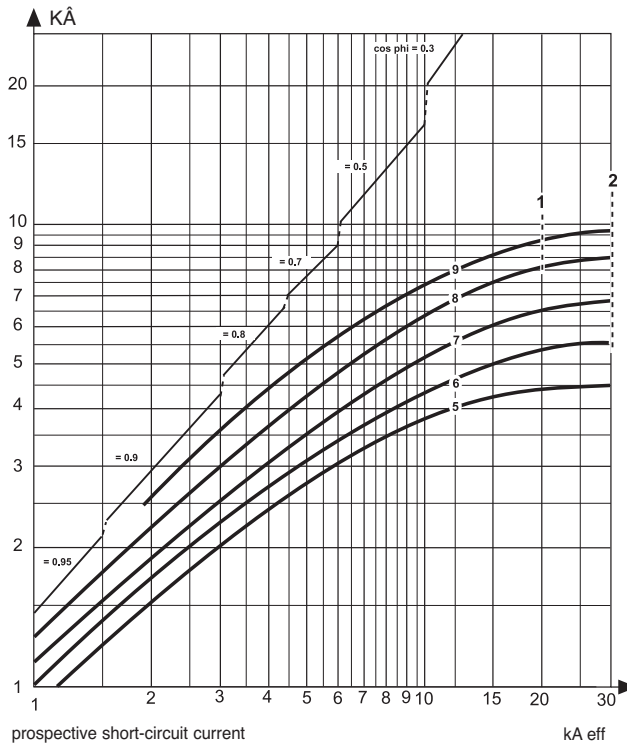


peak current limitation

C120N, H 240 V

- Ue:
 - 240 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C120N
 - 2: C120H
 - 5: 10-16 A
 - 6: 20-25 A
 - 7: 32-40 A
 - 8: 50-63 A
 - 9: 80-100-125 A

limited peak current

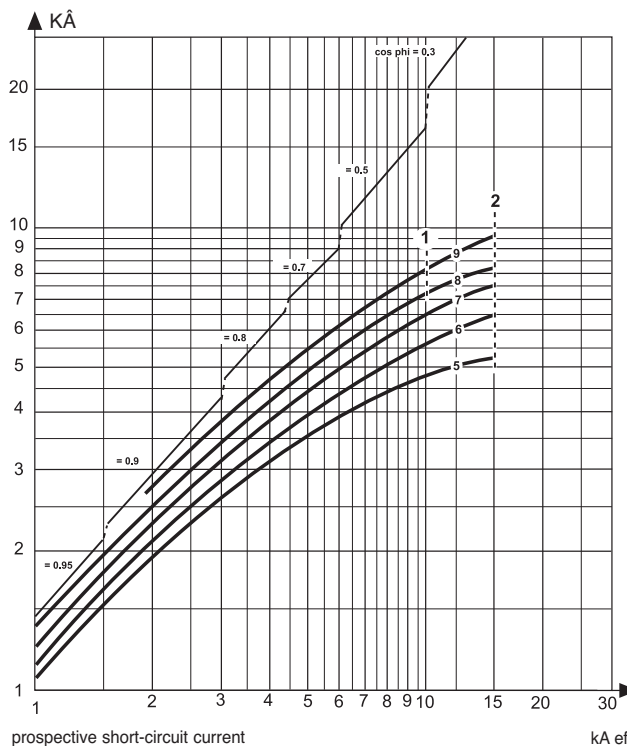


peak current limitation

C120N, H 240/415 V

- Ue:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
 - 1: C120N
 - 2: C120H
 - 5: 10-16 A
 - 6: 20-25 A
 - 7: 32-40 A
 - 8: 50-63 A
 - 9: 80-100-125 A

limited peak current

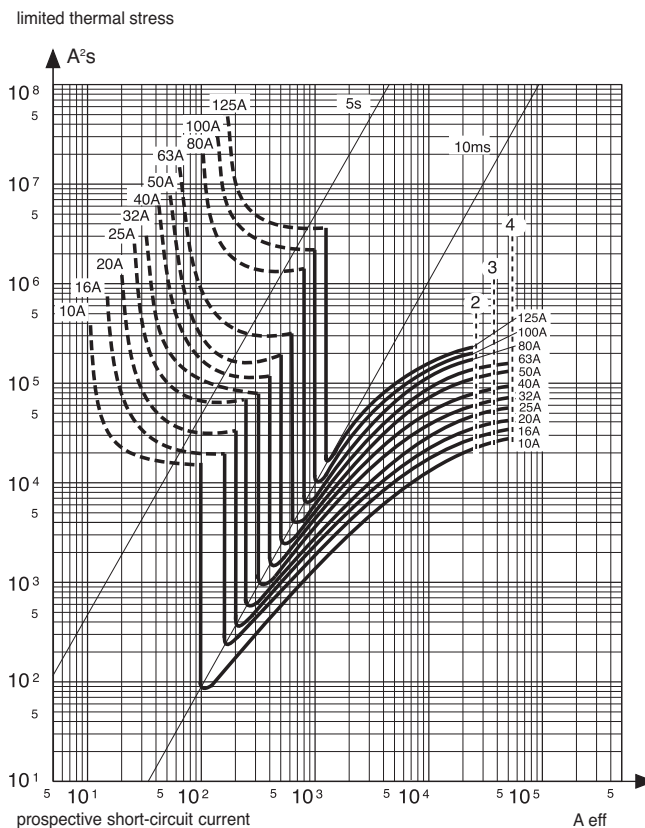


Thermal stress and Peak current limitation curves

thermal stress limitation

NG125 N, H, L C curve 240 V

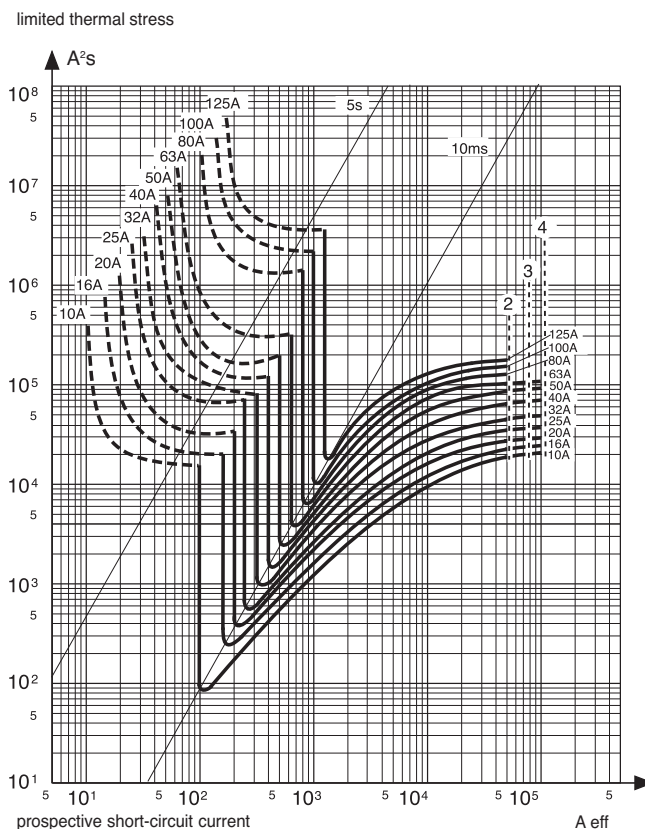
- Ue:
- 240 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
- 2: NG125N
- 3: NG125H
- 4: NG125L



thermal stress limitation

NG125 N, H, L C curve 240/415 V

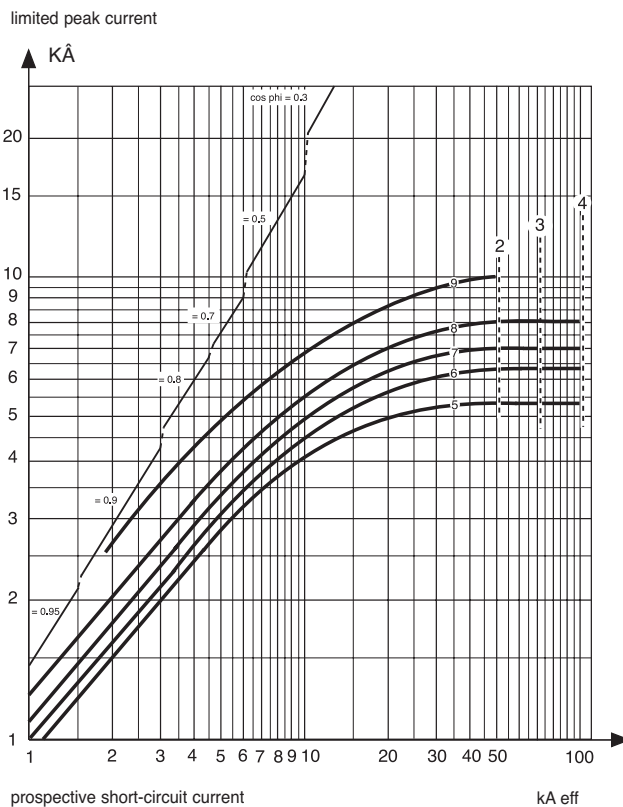
- Ue:
- 240 V with 1P
- 415 V with 2, 3, 4P
- circuit-breaker type in accordance with the mark:
- 2: NG125N
- 3: NG125H
- 4: NG125L



peak current limitation

NG125 N, H, L 240 V

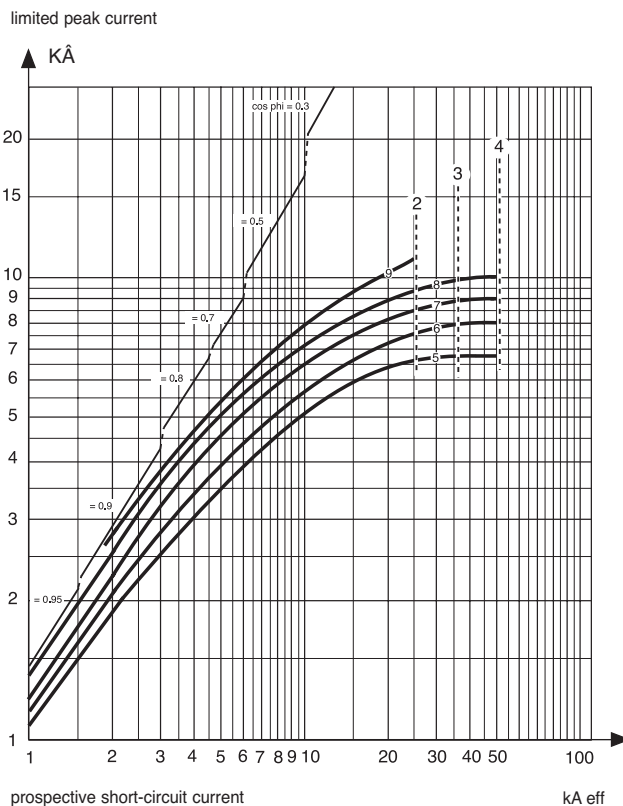
- Ue:
 - 240 V with 2, 3, 4P
- legend:
 - 2: NG125N
 - 3: NG125H
 - 4: NG125L
 - 5: 10-16 A
 - 6: 20-25 A
 - 7: 32-40 A
 - 8: 50-63 A
 - 9: 80-100-125 A



peak current limitation

NG125 N, H, L 240/415 V

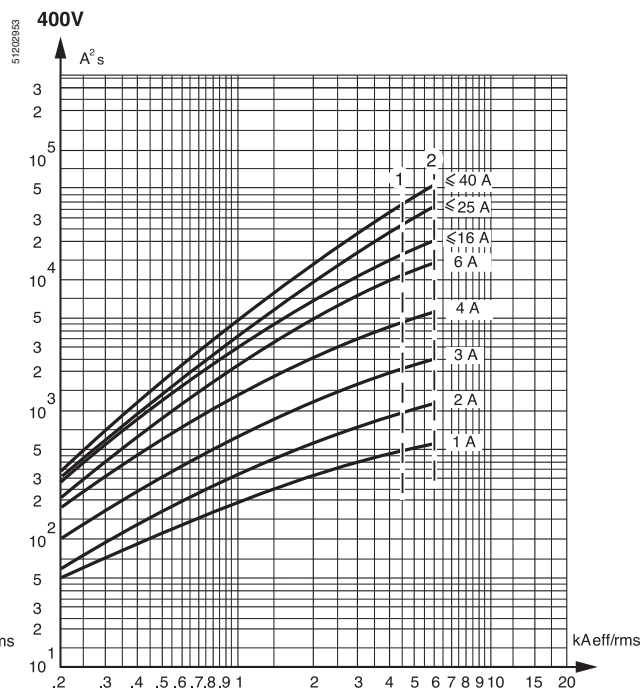
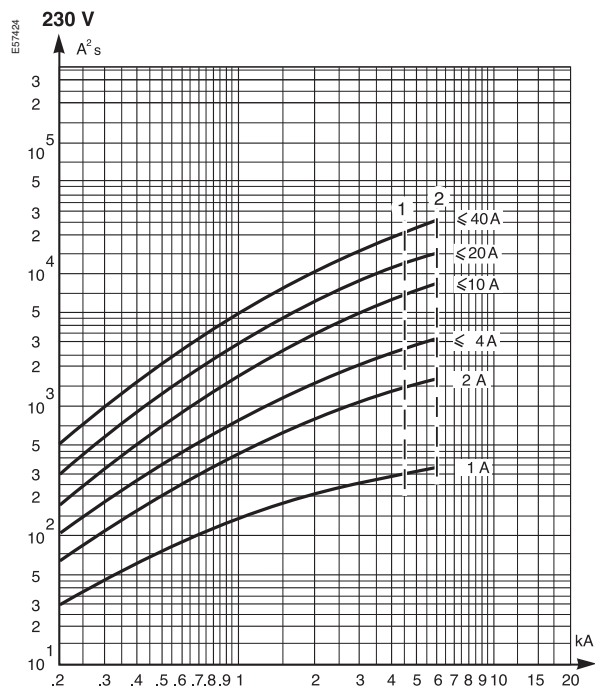
- Ue:
 - 240 V with 1P
 - 415 V with 2, 3, 4P
- legend:
 - 2: NG125N
 - 3: NG125H
 - 4: NG125L
 - 5: 10-16 A
 - 6: 20-25 A
 - 7: 32-40 A
 - 8: 50-63 A
 - 9: 80-100-125 A



Thermal stress and Peak current limitation curves

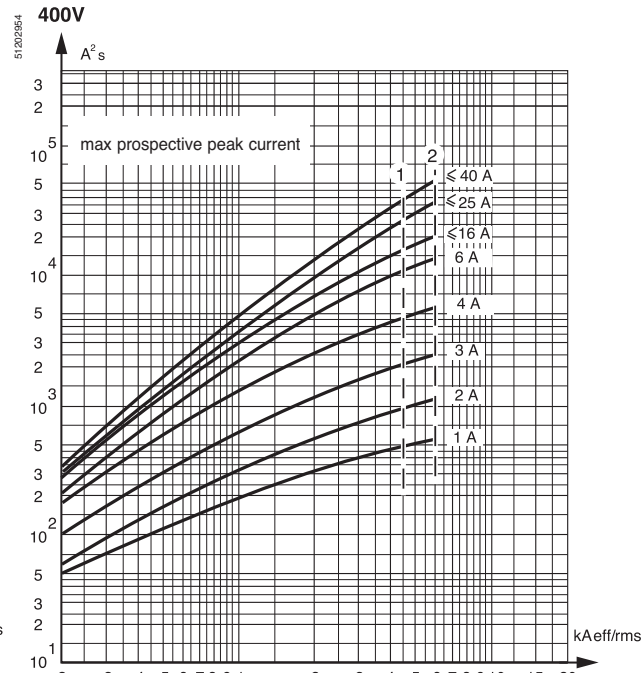
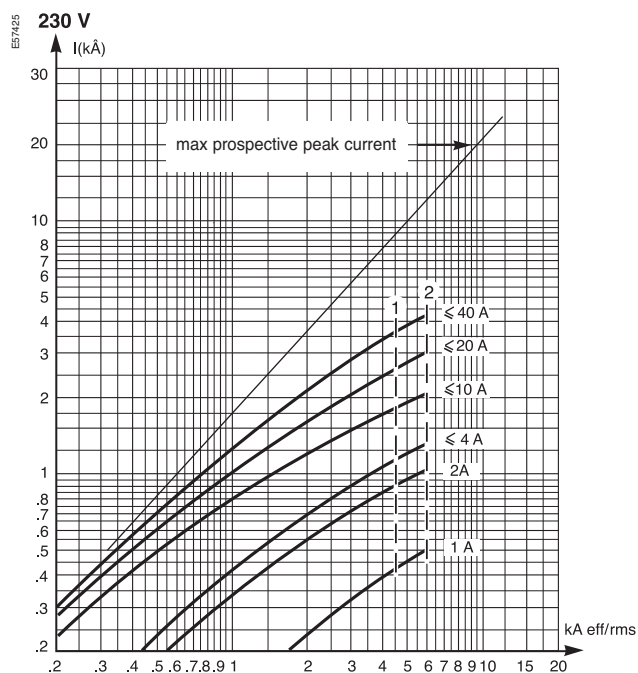
Thermal stress limitation according to standard IEC 60898

- Ue: 230 V AC phase-neutral, 400 V AC phase to phase
- Breaker type:
 - 1 : i DPN and i DPN Vigi : 4500 A
 - 2 : i DPN N and DPN Vigi c : 6000 A



Peak current limitation according to standard IEC 60898

- Ue: 230 V AC phase-neutral, 400 V AC phase to phase:
- Breaker type:
 - 1 : i DPN and i DPN Vigi : 4500 A
 - 2 : i DPN N and DPN Vigi c : 6000 A



The maximum permissible current in a device depends on the ambient temperature in which it is placed.

Ambient temperature is the temperature inside the enclosure or switchboard in which the devices have been installed.

The reference temperature is in the coloured column for the various circuit-breakers.

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

example

The table below shows how to determine the following for a C60a depending on the ambient temperature and the installation mode:

- the service current which must not be exceeded for a rating of 20 A (reference temperature 30 °C)
- the ratings which must be adopted (in bold) to allow a service current of 20 A.

service current which must not be exceeded (A)

Installation conditions		Single C60		Several C60a in the same enclosure (calculated using the reduction coefficient indicated below)	
temperature (°C)		30 °C	40 °C	30 °C	40 °C
C60a	nominal rating (A)	real rating (A)	real rating (A)	real rating (A)	real rating (A)
	20	20	19	$20 \times 0.8 = 16$	$19 \times 0.8 = 15.2$
	25	25	23.7	$25 \times 0.8 = 20$	$23.7 \times 0.8 = 18.96$
	32	32	30.4	$32 \times 0.8 = 25.6$	$30 \times 0.8 = 24$

max. current (A) according to ambient temperature

i DPN, i DPN N

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
1	1.04	1.02	1	0.98	0.96	0.94	0.92	0.90	0.88
2	2.08	2.04	2	1.96	1.91	1.87	1.82	1.77	1.72
3	3.12	3.06	3	2.94	2.87	2.80	2.74	2.67	2.60
6	6.19	6.10	6	5.90	5.80	5.70	5.59	5.48	5.37
10	10.38	10.19	10	9.81	9.61	9.41	9.20	8.99	8.77
16	16.55	16.28	16	15.72	15.43	15.14	14.84	14.54	14.23
20	20.68	20.34	20	19.65	19.30	18.94	18.57	18.20	17.82
25	25.89	25.45	25	24.55	24.08	23.61	23.13	22.64	22.13
32	33.23	32.62	32	31.37	30.72	30.06	29.39	28.70	27.99
40	41.60	40.81	40	39.17	38.33	37.47	36.58	35.68	34.75

max. current (A) according to ambient
temperature (continued)

C60a and C60H: C curve
C60N: B and C curves

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
1	1.05	1.02	1	0.98	0.95	0.93	0.90	0.88	0.85
2	2.08	2.04	2	1.96	1.92	1.88	1.84	1.80	1.74
3	3.18	3.09	3	2.91	2.82	2.70	2.61	2.49	2.37
4	4.24	4.12	4	3.88	3.76	3.64	3.52	3.36	3.24
6	6.24	6.12	6	5.88	5.76	5.64	5.52	5.40	5.30
10	10.6	10.3	10	9.70	9.30	9.00	8.60	8.20	7.80
16	16.8	16.5	16	15.5	15.2	14.7	14.2	13.8	13.3
20	21.0	20.6	20	19.4	19.0	18.4	17.8	17.4	16.8
25	26.2	25.7	25	24.2	23.7	23.0	22.2	21.5	20.7
32	33.5	32.9	32	31.4	30.4	29.8	28.4	28.2	27.5
40	42.0	41.2	40	38.8	38.0	36.8	35.6	34.4	33.2
50	52.5	51.5	50	48.5	47.4	45.5	44.0	42.5	40.5
63	66.2	64.9	63	61.1	58.0	56.7	54.2	51.7	49.2

C60N: D curve
C60L: B, C, Z, and K curves

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
1	1.10	1.08	1.05	1.03	1	0.97	0.95	0.92	0.89
2	2.18	2.14	2.08	2.04	2	1.96	1.90	1.86	1.80
3	3.42	3.30	3.21	3.12	3	2.88	2.77	2.64	2.52
4	4.52	4.40	4.24	4.12	4	3.88	3.72	3.56	3.44
6	6.48	6.36	6.24	6.12	6	5.88	5.76	5.58	5.46
10	11.4	11.1	10.7	10.4	10	9.60	9.20	8.80	8.40
16	17.9	17.4	16.9	16.4	16	15.5	15.0	14.4	13.9
20	22.2	21.6	21.2	20.6	20	19.4	18.8	18.2	17.6
25	27.7	27.0	26.5	25.7	25	24.2	23.5	22.7	21.7
32	35.2	34.2	33.6	32.9	32	31.0	30.4	29.4	28.4
40	44.4	43.6	42.4	41.2	40	38.8	37.6	36.4	34.8
50	56.0	54.5	53.0	51.5	50	48.5	46.5	45.0	43.0
63	71.8	69.9	67.4	65.5	63	60.4	57.9	55.4	52.9

C32H - DC

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
1	1.1	1.1	1	1	1	0.95	0.9	0.9	0.9
2	2.2	2.2	2.1	2.1	2	1.95	1.9	1.8	1.7
3	3.3	3.3	3.2	3.1	3	2.9	2.8	2.7	2.6
6	6.6	6.5	6.3	6.1	6	5.8	5.7	5.5	5.3
10	11	10.7	10.5	10.3	10	9.7	9.5	9	8.5
16	17.6	17.4	17	16.5	16	15.4	15	14.4	13.9
20	22	21.5	21	20.5	20	19.5	19	18.5	18
25	27.5	27	26	25.5	25	24	23.5	23	22
32	35.5	35	34	33	32	31	30	29	28
40	44.5	43.5	42.5	41	40	38.5	37	36	34

NG125

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
10	11	10.75	10.5	10.25	10	9.75	9.5	9.25	9
16	17.6	17.2	16.8	16.4	16	15.6	15.2	14.8	14.4
20	22	21.5	21	20.5	20	19.5	19	18.5	18
25	27.5	26.87	26.25	25.62	25	24.37	23.75	23.12	22.5
32	35.2	34.4	33.6	32.8	32	31.2	30.4	29.6	28.8
40	44	43	42	41	40	39	38	37	36
50	55	53.75	52.5	51.25	50	48.75	47.5	46.25	45
63	69.3	67.72	66.15	64.57	63	61.42	59.85	58.27	56.7
80	88	86	84	82	80	78	76	74	72
100	110	107.5	105	102.5	100	97.5	95	92.5	90
125	137.5	134.3	131.2	128.1	125	121.8	118.7	115.6	112.5

max. current (A) according to ambient temperature (continued)

C120 in accordance with EN 60898

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
10	10.8	10.4	10	9.6	9.2	8.7	8.2	7.7	7.2
16	17.0	16.5	16	15.5	14.9	14.3	13.7	13.1	12.4
20	21.5	20.7	20	19.2	18.4	17.6	16.7	15.7	14.8
25	27.3	26.2	25	23.7	22.4	21.0	19.5	17.8	16.0
32	34.3	33.2	32	30.8	29.5	28.2	26.8	25.4	23.8
40	43.3	41.7	40	38.3	36.4	34.5	32.5	30.3	28.0
50	54.4	52.2	50	47.7	45.2	42.6	39.8	36.9	33.6
63	68.1	65.6	63	60.3	57.5	54.5	51.3	48.0	44.4
80	85.9	83.0	80	76.9	73.6	70.2	66.6	62.8	58.7
100	109.1	104.7	100	95.1	90.0	84.5	78.7	72.4	65.4
125	136.7	131.0	125	118.7	112.1	105.0	97.4	89.2	80.1

C120 in accordance with IEC 60947-2

temperature (°C)	20	25	30	35	40	45	50	55	60
rating (A)									
10	11.7	11.3	11	10.5	10	9.5	9.0	8.4	7.8
16	18.6	18.0	17	16.9	16	15.6	15.0	14.3	13.6
20	23.4	22.6	22	21.0	20	19.2	18.2	17.2	16.1
25	29.8	28.6	27	25.9	25	22.9	21.2	19.4	17.5
32	37.4	36.2	35	33.6	32	30.8	29.2	27.7	26.0
40	47.2	45.4	44	41.7	40	37.6	35.4	33.0	30.5
50	59.3	56.9	55	52.0	50	46.4	43.4	40.2	36.7
63	74.2	71.5	69	65.7	63	59.4	56.0	52.3	48.4
80	93.7	90.5	87	83.8	80	76.5	72.6	68.4	64.0
100	118.9	114.1	109	103.7	100	92.1	85.7	78.9	71.3
125	149.0	142.8	136	129.4	125	114.4	106.2	97.2	87.3

RCCB-ID in accordance with IEC 60947-3

temperature (°C)	20	30	40	50	60
rating (A)					
16	20	18	16	14	12
25	32	30	25	23	20
40	46	44	40	36	32
63	75	70	63	56	50
80	95	90	80	72	65
100	123	120	100	95	90
125	135	133	125	118	110

note: the thermal protection device (overload) placed upstream from the residual current circuit-breaker should take the values indicated in the table above into account.

Complementary Technical Information Circuit breakers

practical advice

Power Loss circuit-breakers and switches

what is the power loss per pole?

the table below indicates device power loss in Watts for each rating, per pole, with nominal current:

rating	0.5	0.75	1	1.6	2	2.5	3	4	6	6.3	10	12.5	16	20	25	32	40	50	63	80	100	125
circuit-breakers																						
i DPN N									2.6		1.8		3.3	3.6	4	4.4	6.2					
C60	2.2	2.96	2.3		2.5		2.4	2.4	3		2		2.6		2.9	3	3.5	4.6	4.5	6.6		
C120											1.7		2.3	2.65	2.7	3.8	3.6	4.5	4.8	4.5	6	8
NG125											2		2.5	3	3.2	3.5	4	4.7	5.5	6	7	9
C60LMA				2.4		2.5		2.4		3	2	2.2	2.6		3		4.6					
NG125LMA								3		2	2		2.5	3	3.2	3.5	4	4.7	5.5	6	7	9
switch																						
NG125NA																		5.5	6	7	9	
RCCB-ID												1			1.3		3.2		3.2	6	9	
I														0.32			0.6		1.7		5.1	

What is cascading?

Cascading is the use of the current limiting capacity of circuit-breakers at a given point to permit installation of lower-rated and therefore lower-cost circuit breakers downstream.

The upstream Compact circuit breakers acts as a barrier against short-circuit currents. In this way, downstream circuit breakers with lower breaking capacities than the prospective short-circuit (at their point of installation) operate under their normal breaking conditions.

Since the current is limited throughout the circuit controlled by the limiting circuit breaker, cascading applies to all switchgear downstream. It is not restricted to two consecutive devices.

General use of cascading

With cascading, the devices can be installed in different switchboards. Thus, in general, cascading refers to any combination of circuit breakers where a circuit breaker with a breaking capacity less than the prospective I_{sc} at its point of installation can be used. Of course, the breaking capacity of the upstream circuit breaker must be greater than or equal to the prospective short-circuit current at its point of installation.

The combination of two circuit breakers in cascading configuration is covered by the following standards:

- IEC 60947-2 (construction)
- NF C 15-100, § 434.3.1 (installation)

Coordination between circuit breakers

The use of a protective device possessing a breaking capacity less than the prospective short-circuit current at its installation point is permitted as long as another device is installed upstream with at least the necessary breaking capacity. In this case, the characteristics of the two devices must be coordinated in such a way that the energy let through by the upstream device is not more than that which can be withstood by the downstream device and the cables protected by these devices without damage.

Cascading can only be checked by laboratory tests and the possible combinations can be specified only by the circuit breaker manufacturer.

Cascading and protection discrimination

In cascading configurations, due to the Roto-active breaking technique, discrimination is maintained and, in some cases, even enhanced. Consult the enhanced discrimination tables on pages F23 to F49 for data on discrimination limits.

Cascading tables

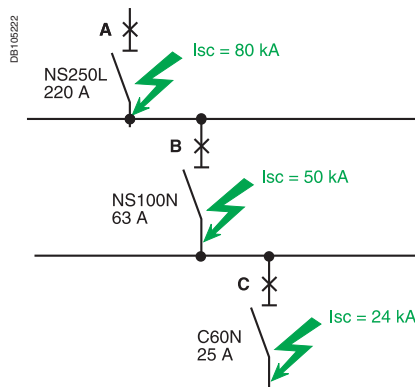
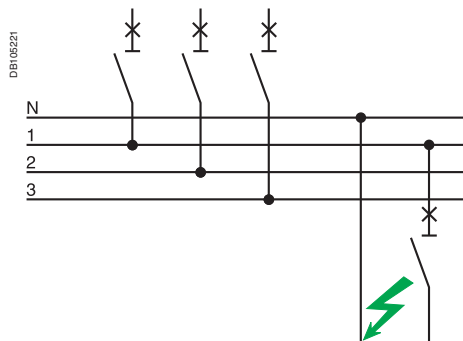
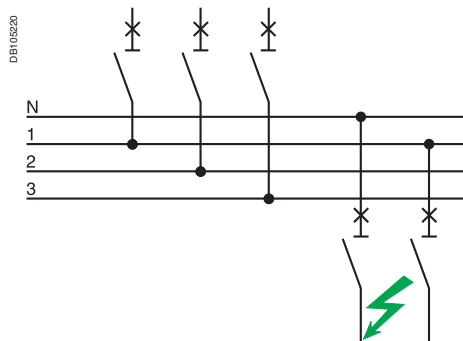
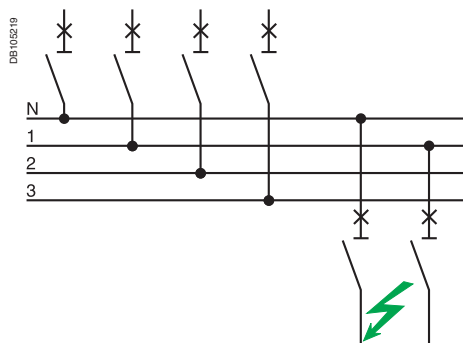
Merlin Gerin cascading tables are:

- drawn up on the basis of calculations (comparison between the energy limited by the upstream device and the maximum permissible thermal stress for the downstream device)

- verified experimentally in accordance with IEC standard 60947-2.

For distribution systems with 220/240 V, 400/415 V and 440 V between phases, the tables of the following pages indicate cascading possibilities between upstream

Compact and downstream Multi 9 and Compact circuit breakers as well as between upstream Masterpact and downstream Compact circuit breakers.



220/240 V network downstream from a 380/415 V network

For 1P+N or 2P circuit breakers connected between the phase and neutral on a 380/415 V network, with a TT or TNS neutral system, consult the 220/240 V cascading table to determinate cascading possibilities between upstream and downstream circuit-breakers.

For 1P circuit breakers connected to one phase of a 380/415 V network used together with the neutral to supply a single-phase circuit, consult the cascading tables for 380/415 V networks to determine the cascading possibilities between upstream and downstream circuit breakers.

Example of three level cascading

Consider three circuit breakers **A**, **B** and **C** connected in series. The criteria for cascading are fulfilled in the following two cases:

- the upstream device **A** is coordinated for cascading with both devices **B** and **C** (even if the cascading criteria are not fulfilled between **B** and **C**). It is simply necessary to check that the combinations **A+B** and **A+C** have the required breaking capacity

- each pair of successive devices is coordinated, i.e. **A** with **B** and **B** with **C** (even if the cascading criteria are not fulfilled between **A** and **C**). It is simply necessary to check that the combinations **A+B** and **B+C** have the required breaking capacity.

The upstream breaker **A** is a NS250L (breaking capacity 150 kA) for a prospective I_{sc} of 80 kA across its output terminals.

A NS100N (breaking capacity 36 kA) can be used for circuit breaker **B** for a prospective I_{sc} of 50 kA across its output terminals, since the "reinforced" breaking capacity provided by cascading with the upstream NS250L is 150 kA.

A C60N (breaking capacity 10 kA) can be used for circuit breaker **C** for a prospective I_{sc} of 24 kA across its output terminals since the "reinforced" breaking capacity provided by cascading with the upstream NS250L is 30 kA.

Note that the "reinforced" breaking capacity of the C60N with the NS100N upstream is only 36 kA, but:

- $A+B = 150 \text{ kA}$
- $A+C = 30 \text{ kA}$.

Upstream	iDPN N	C60N	C60H	C60L			C120N	C120H	NG125N	NG125H	NG125L
Breaking capacity (kA rms)	10	20	30	≤ 25 A 50	32/40 A 40	50/63 A 30	20	30	50	70	100
Downstream	Breaking capacity (kA rms)										
iDPN	10	15	20	30	25	20	15	20	20	40	50
iDPN N		20	30	50	40	30	20	30	30	40	50
C60N			30	50	40	30		30	50	50	50
C60H				50	40				50	70	70
C60L ≤ 25 A										70	100
C60L ≤ 40 A									50	70	100
C60L ≤ 63 A									50	70	70
C120N			30	50	40	30			50		70
C120H				50					50		70
NG125N											70
NG125H											100

Upstream	NSA160E	NSA160N	NR100F	NS100N	NS100SX	NS100H	NS100L
Breaking capacity (kA rms)	25	50	35	85	90	100	150
Downstream	Breaking capacity (kA rms)						
iDPN			20	20	20	20	20
iDPN N			30	30	30	30	30
C60N	25	40	35	40	90	100	100
C60H		50	35	50	90	100	100
C60L ≤ 25A				65	90	100	100
C60L ≤ 40A		50		65	90	100	100
C60L ≤ 63A		50		65	90	100	100
P25M ≥ 14A				85	90	100	100
C120N	25	40	35	40	50	50	70
C120H	25	40	35	40	50	50	70
NG125N				60	70	70	85
NG125H				85	85	85	100
NG125L/LMA							150

Upstream	NR160F	NS160N	NS160SX	NS160H	NS160L	NR250F	NS250N	NS250SX	NS250H	NS250L
Breaking capacity (kA rms)	35	85	90	100	150	35	85	90	100	150
Downstream	Breaking capacity (kA rms)									
iDPN	20	20	20	20	20	20	20	20	20	20
iDPN N	30	30	30	30	30	30	30	30	30	30
C60N	35	40	60	60	60	35	40	60	60	60
C60H	35	50	80	80	80	35	50	65	65	65
C60L ≤ 25A		65	80	80	80		65	80	80	80
C60L ≤ 40A		65	80	80	80		65	80	80	80
C60L ≤ 63A		65	80	80	80		50	65	65	65
P25M ≥ 14A		85	90	100	100					
C120N	35	40	50	50	70	35	40	50	50	70
C120H	35	40	50	50	70	35	40	50	50	70
NG125N		60	70	70	85		60	70	70	85
NG125H		85	85	85	100		85	85	85	100
NG125L/LMA					150					150

Complementary Technical Information Circuit breakers

Cascading, network 380/415 V ⁽¹⁾ Upstream: Compact and Multi 9 Downstream: Compact and Multi 9

Upstream Breaking capacity (kA rms)	C60N iDPN N 10	C60H 15	C60L ≤ 25 A 25	32/40 A 20	50/63 A 15	C120N 10	C120H 15	NG125N 25	NG125H 36	NG125L 50
Downstream										
iDPN	10	10	20	15	10	10	10	10	15	20
iDPN N		15	25	20	15		15	15	20	25
C60N		15	25	20	15		15	25	25	25
C60H			25					25	36	36
C60L ≤ 25 A									36	50
C60L ≤ 40 A								25	36	50
C60L ≤ 63 A								25	36	36
C120N							15	25	25	36
C120H							15	25	25	36
NG125N									36	36
NG125H										50

Upstream Breaking capacity (kA rms)	NSA160E iDPN N 16	NSA160N 30	NR100F ≤ 25 A 25	NS100N 32/40 A 36	NS100SX 50/63 A 50	NS100H 70	NS100L 150
Downstream	Breaking capacity (kA rms)						
iDPN	10	10	10	10	10	10	10
iDPN N	15	15	15	15	15	15	15
C60N	16	25	25	25	30	30	30
C60H	16	30	25	25	40	40	40
C60L ≤ 25A		30			40	40	40
C60L ≤ 40A		30	25	25	40	40	40
C60L ≤ 63A		30	25	25	40	40	40
P25M ≥ 14A	16	25	25	25	40	50	50
C120N/H	16	25	25	25	25	25	25
NG125N		30			36	36	70
NG125H					40	50	100
NG125L/LMA					50	70	150

Upstream Breaking capacity (kA rms)	NR160F 25	NS160N 36	NS160SX 50	NS160H 70	NS160L 150	NR250F 25	NS250N 36	NS250SX 50	NS250H 70	NS250L 150
Downstream	Breaking capacity (kA rms)									
iDPN	10	10	10	10	10	10	10	10	10	10
iDPN N	15	15	15	15	15	15	15	15	15	15
C60N	25	25	30	30	30	25	25	30	30	30
C60H	25	30	40	40	40	25	30	30	30	30
C60L ≤ 25 A		30	40	40	40		30	40	40	40
C60L ≤ 40 A	25	30	40	40	40	25	30	40	40	40
C60L ≤ 63 A	25	30	40	40	40	25	30	30	30	30
P25M ≥ 14 A	25	25	40	50	50					
C120N/H	25	25	25	25	25	25	25	25	25	25
NG125N		36	36	36	70		36	36	36	70
NG125H			40	50	100			40	50	100
NG125L/LMA			50	70	150			50	70	150

(1) With single pole, single pole + neutral and two pole circuit breakers, with TT or TNS systems, see cascading table for 220/240 V network.

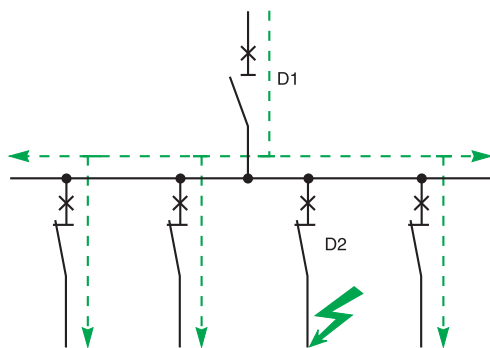
Protection discrimination is an essential element that must be taken into account starting at the design stage of a low voltage installation to ensure the highest level of availability for users.

Discrimination is important in all installations for the comfort of users, however it is fundamental in installations requiring a high level of service continuity, e.g. industrial manufacturing processes.

Industrial installations without discrimination run a series of risks of varying importance including:

- production deadline overruns
- interruption in manufacturing, entailing:
 - production or finished-product losses
 - risk of damage to production machines in continuous processes
- restarting of machines, one by one, following a general power outage
- shutdown of vital safety equipment such as lubrication pumps, smoke fans, etc.

DB103225



What is discrimination?

Discrimination, also called selectivity, is the coordination of automatic protection devices in such a manner that a fault appearing at a given point in a network is cleared by the protection device installed immediately upstream of the fault, and by that device alone.

■ total discrimination

Discrimination is said to be total if, for all fault current values, from overloads up to the non-resistive short-circuit current, circuit breaker D2 opens and D1 remains closed.

■ partial discrimination

Discrimination is partial if the above condition is not respected up to the full short-circuit current, but only to a lesser value termed the selectivity limit current (I_s).

■ no discrimination

In the event of a fault, both circuit breakers D1 and D2 open.

Total discrimination as standard with the new Masterpact NT/NW circuit breakers

Thanks to their highly innovative design and the exceptional performance of their control units, the new Masterpact NT and NW circuit breakers offer total discrimination with downstream Compact NS devices up to 630 A as standard ⁽¹⁾.

Natural discrimination with Compact NS circuit breakers

Due to the Roto-active breaking technique employed by the Compact NS, the combined use of Merlin Gerin circuit breakers provides an exceptional level of protection discrimination.

This is the result of the implementation and optimisation of three different techniques:

- current discrimination
- time discrimination
- energy discrimination

Overload protection: current discrimination

Discrimination is ensured if the ratio between setting thresholds is greater than 1.6 (for distribution circuit breakers).

Low short-circuit protection: current discrimination

Tripping of the upstream device is slightly delayed to ensure that the downstream device trips first.

Discrimination is ensured if the ratio between the short-circuit thresholds is greater than 1.5.

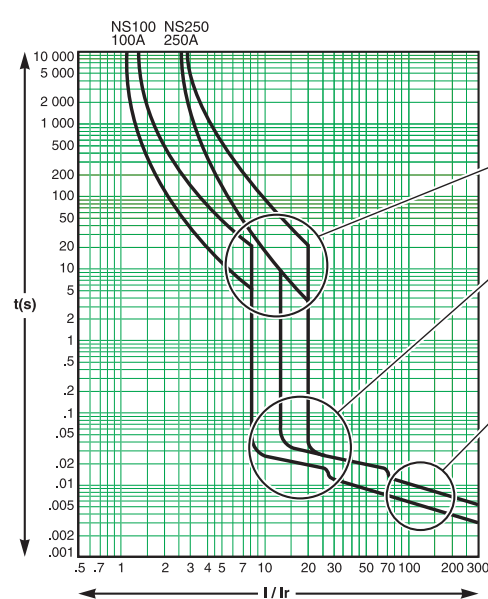
High short-circuit protection: time discrimination

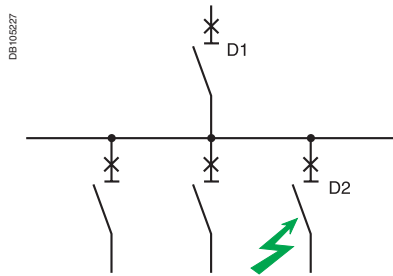
This protection system combines the exceptional current limiting capacity of the Compact NS and the advantages of reflex tripping, sensitive to the energy dissipated in the device by the short-circuit. In the event of a high short-circuit detected by two circuit breakers, the downstream device limits it sharply. The energy dissipated in the upstream device is not sufficient to trip it, i.e. discrimination is total for all short-circuit currents.

Discrimination is ensured if the ratio between the circuit breaker ratings is greater than 2.

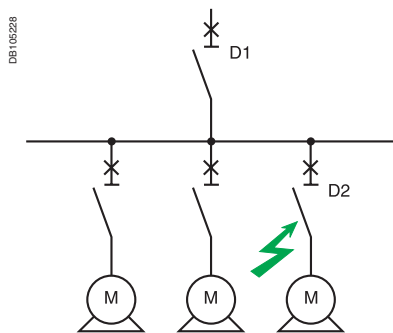
⁽¹⁾ Except for the L1 performance level on Masterpact NT and subject to the discrimination rules in "Complementary Technical Information" catalogue, ref.ABTED305161EN.

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Discrimination between two distribution circuit breakers.



Discrimination between circuit breakers used for motor protection.

How to use the discrimination tables

■ for discrimination between 2 distribution circuit breakers

Combinations providing full discrimination are indicated by the symbol T.

If discrimination is partial, the table indicates the maximum fault current value for which discrimination is ensured. For fault currents above this value, the 2 circuit breakers trip simultaneously.

■ for discrimination between a circuit breaker and a motor control and protection assembly

If discrimination is partial, the table indicates the maximum fault current value for which discrimination is ensured. For fault currents above this value, the 2 devices trip simultaneously.

Requisite conditions

The values indicated in the tables (for 220, 380, 415 and 440 V) are guaranteed if the following conditions are respected:

D1	Application	D2	Ratio between upstream and downstream settings	
			Thermal protection I _r up/I _r down	Magnetic protection I _m up/I _m down
TM...D	Distribution	TM...D or Multi 9	≥ 1.6	≥ 2
		STR...SE/GE	≥ 1.6	≥ 1.5
	Motor	MA + separate therm. relay	≥ 3	≥ 2
		Thermal-magnetic motor type	≥ 3	≥ 2
		STR...ME	≥ 3	≥ 1.5
STR2.. or 3.. fixed long time delay	Distribution	TM...D or Multi 9	≥ 2.5	≥ 1.5
		STR...SE/GE	≥ 1.6	≥ 1.5
	Motor	MA + separate therm. relay	≥ 3	≥ 1.5
		Thermal-magnetic motor type	≥ 3	≥ 1.5
		STR...ME	≥ 3	≥ 1.5
Micrologic 2/5/6/7.0 STR5.. or 6.. with adjustable long time delay ⁽¹⁾	Distribution	TM...D or Multi 9	≥ 1.6	≥ 1.5
		STR...SE/GE Micrologic 2/5/6/7.0	≥ 1.3	≥ 1.5
	Motor	MA + separate therm. relay	≥ 3	≥ 1.5
		Thermal-magnetic motor type	≥ 3	≥ 1.5
		STR...ME, Micrologic 2/5/6/7.0	≥ 3	≥ 1.5
		Thermal-magnetic motor type	≥ 3	≥ 1.5

(1) When upstream and/or downstream control units have adjustable long time delays, adjustment must be such as upstream delay is longer than downstream delay (1 step difference).

Upstream		iDPN										
		B curve										
In (A)		1	2	3	4	6	10	16	20	25	32	40
Downstream Rating												
Discrimination limit (A)												
iDPN	1		8	12	16	25	40	63	80	100	125	160
B curve	2			12	16	25	40	63	80	100	125	160
	3					25	40	63	80	100	125	160
	4					25	40	63	80	100	125	160
	6						40	63	80	100	125	160
	10							63	80	100	125	160
	16									100	125	160
	20										125	160
	25											160
	32											
	40											
Discrimination limit (A)												
iDPN	1		8	12	16	25	40	63	80	100	125	160
C curve	2				16	25	40	63	80	100	125	160
	3					25	40	63	80	100	125	160
	4						40	63	80	100	125	160
	6							63	80	100	125	160
	10								80	100	125	160
	16										125	160
	20											160
	25											
	32											
	40											
Discrimination limit (A)												
iDPN	1				16	25	40	63	80	100	125	160
D curve	2					25	40	63	80	100	125	160
	3						40	63	80	100	125	160
	4							63	80	100	125	160
	6								80	100	125	160
	10										125	160
	16											160
	20											
	25											
	32											
	40											

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: iDPN, C curve

Downstream: iDPN, B, C, D curves

Upstream		iDPN										
		C curve										
In (A)		1	2	3	4	6	10	16	20	25	32	40
Downstream Rating												
Discrimination limit (A)												
iDPN	1		16	25	32	50	80	125	160	200	250	320
B curve	2			25	32	50	80	125	160	200	250	320
	3				32	50	80	125	160	200	250	320
	4					50	80	125	160	200	250	320
	6						80	125	160	200	250	320
	10							125	160	200	250	320
	16								160	200	250	320
	20										250	320
	25											320
	32											
	40											
Discrimination limit (A)												
iDPN	1		16	25	32	50	80	125	160	200	250	320
C curve	2			25	32	50	80	125	160	200	250	320
	3				32	50	80	125	160	200	250	320
	4					50	80	125	160	200	250	320
	6						80	125	160	200	250	320
	10							125	160	200	250	320
	16								160	200	250	320
	20										250	320
	25											320
	32											
	40											
Discrimination limit (A)												
iDPN	1		16	25	32	50	80	125	160	200	250	320
D curve	2				32	50	80	125	160	200	250	320
	3					50	80	125	160	200	250	320
	4						80	125	160	200	250	320
	6							125	160	200	250	320
	10								160	200	250	320
	16									200	250	320
	20											320
	25											
	32											
	40											

400

Discrimination limit = 400 A.



No discrimination.

Upstream		iDPN										
		D curve										
In (A)		1	2	3	4	6	10	16	20	25	32	40
Downstream Rating												
Discrimination limit (A)												
iDPN	1	12	24	40	50	72	125	200	250	300	400	500
B curve	2			40	50	72	125	200	250	300	400	500
	3					72	125	200	250	300	400	500
	4					72	125	200	250	300	400	500
	6						125	200	250	300	400	500
	10							200	250	300	400	500
	16									300	400	500
	20										400	500
	25											500
	32											
	40											
Discrimination limit (A)												
iDPN	1	12	24	40	50	72	125	200	250	300	400	500
C curve	2			40	50	72	125	200	250	300	400	500
	3					72	125	200	250	300	400	500
	4					72	125	200	250	300	400	500
	6						125	200	250	300	400	500
	10							200	250	300	400	500
	16									300	400	500
	20										400	500
	25											500
	32											
	40											
Discrimination limit (A)												
iDPN	1	12	24	40	50	72	125	200	250	300	400	500
D curve	2			40	50	72	125	200	250	300	400	500
	3					72	125	200	250	300	400	500
	4					72	125	200	250	300	400	500
	6						125	200	250	300	400	500
	10							200	250	300	400	500
	16									300	400	500
	20										400	500
	25											500
	32											
	40											

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: C60N/H/L, B curve
Downstream: iDPN, C60
B, C, D curves

Upstream		C60N/H/L											
		B curve											
In (A)		2	3	4	6	10	16	20	25	32	40	50	63
Downstream Rating													
Discrimination limit (A)													
iDPN, C60 B curve	1			16	25	40	63	80	100	125	160	200	250
	2			16	25	40	63	80	100	125	160	200	250
	3				25	40	63	80	100	125	160	200	250
	4				25	40	63	80	100	125	160	200	250
	6					40	63	80	100	125	160	200	250
	10						63	80	100	125	160	200	250
	16								100	125	160	200	250
	20									125	160	200	250
	25										160	200	250
	32											200	250
	40												250
	50/63												
Discrimination limit (A)													
iDPN, C60 C curve	1			16	25	40	63	80	100	125	160	200	250
	2			16	25	40	63	80	100	125	160	200	250
	3				25	40	63	80	100	125	160	200	250
	4					40	63	80	100	125	160	200	250
	6						63	80	100	125	160	200	250
	10							80	100	125	160	200	250
	16									125	160	200	250
	20										160	200	250
	25											200	250
	32												250
	40												
	50/63												
Discrimination limit (A)													
iDPN, C60 D curve	1			16	25	40	63	80	100	125	160	200	250
	2				25	40	63	80	100	125	160	200	250
	3					40	63	80	100	125	160	200	250
	4						63	80	100	125	160	200	250
	6							80	100	125	160	200	250
	10									125	160	200	250
	16										160	200	250
	20											200	250
	25												250
	32												
	40												
	50/63												

400

Discrimination limit = 400 A.



No discrimination.

Upstream		C60N/H/L											
		C curve											
In (A)		2	3	4	6	10	16	20	25	32	40	50	63
Downstream Rating													
Discrimination limit (A)													
iDPN, C60 B curve	1			32	50	80	125	160	200	250	320	400	500
	2			32	50	80	125	160	200	250	320	400	500
	3				50	80	125	160	200	250	320	400	500
	4				50	80	125	160	200	250	320	400	500
	6					80	125	160	200	250	320	400	500
	10						125	160	200	250	320	400	500
	16							200	250	320	400	500	
	20								250	320	400	500	
	25									320	400	500	
	32										400	500	
	40											500	
	50/63												
Discrimination limit (A)													
iDPN, C60 C curve	1			32	50	80	125	160	200	250	320	400	500
	2			32	50	80	125	160	200	250	320	400	500
	3				50	80	125	160	200	250	320	400	500
	4				50	80	125	160	200	250	320	400	500
	6					80	125	160	200	250	320	400	500
	10						125	160	200	250	320	400	500
	16							200	250	320	400	500	
	20								250	320	400	500	
	25									320	400	500	
	32										400	500	
	40											500	
	50/63												
Discrimination limit (A)													
iDPN, C60 D curve	1			32	50	80	125	160	200	250	320	400	500
	2			32	50	80	125	160	200	250	320	400	500
	3				50	80	125	160	200	250	320	400	500
	4					80	125	160	200	250	320	400	500
	6						125	160	200	250	320	400	500
	10							160	200	250	320	400	500
	16								200	250	320	400	500
	20									320	400	500	
	25										400	500	
	32											500	
	40												500
	50/63												

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Ups.: C60N/H D curve, C60L K curve

Downstream: iDPN, C60

B, C, D curves

Upstream		C60N/H D curve											
		C60L K curve											
In (A)		2	3	4	6	10	16	20	25	32	40	50	63
Downstream Rating													
Discrimination limit (A)													
iDPN, C60	1			50	72	125	200	250	300	400	500	630	800
B curve	2			50	72	125	200	250	300	400	500	630	800
	3				72	125	200	250	300	400	500	630	800
	4				72	125	200	250	300	400	500	630	800
	6					125	200	250	300	400	500	630	800
	10						200	250	300	400	500	630	800
	16								300	400	500	630	800
	20									400	500	630	800
	25										500	630	800
	32											630	800
	40												800
	50/63												
Discrimination limit (A)													
iDPN, C60	1			50	72	125	200	250	300	400	500	630	800
C curve	2			50	72	125	200	250	300	400	500	630	800
	3				72	125	200	250	300	400	500	630	800
	4				72	125	200	250	300	400	500	630	800
	6					125	200	250	300	400	500	630	800
	10						200	250	300	400	500	630	800
	16								300	400	500	630	800
	20									400	500	630	800
	25										500	630	800
	32											630	800
	40												800
	50/63												
Discrimination limit (A)													
iDPN, C60	1			50	72	125	200	250	300	400	500	630	800
D curve	2			50	72	125	200	250	300	400	500	630	800
	3				72	125	200	250	300	400	500	630	800
	4				72	125	200	250	300	400	500	630	800
	6					125	200	250	300	400	500	630	800
	10						200	250	300	400	500	630	800
	16								300	400	500	630	800
	20									400	500	630	800
	25										500	630	800
	32											630	800
	40												800
	50/63												

400

Discrimination limit = 400 A.



No discrimination.

Upstream		C120N/H										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
iDPN	6		63	80	400	500	700	800	3000	T	T	T
B curve	10			80	100	100	500	600	1800	3000	T	T
	16				100	125	160	200	1000	2000	3300	3750
	20					125	160	200	1000	1600	2500	3700
	25						160	200	800	1300	2100	3700
	32							200	600	1000	1800	2700
	40								250	320	1600	2400
	40											
Discrimination limit (A)												
iDPN	1	300	500	700	1000	1500	2000	2500	T	T	T	T
C curve	2	150	300	500	700	1000	1500	2000	T	T	T	T
	3	40	63	300	500	700	1000	1500	T	T	T	T
	6		63	80	400	500	700	800	3000	T	T	T
	10				100	350	500	600	1800	3000	4000	T
	16					125	340	450	1000	2000	3300	3700
	20						160	200	1000	1600	2500	3700
	25							200	800	1300	2100	3700
	32								600	1000	1800	2700
	40									320	1600	2400
	40											
Discrimination limit (A)												
iDPN, C60	1	300	500	700	1000	1500	2000	2500	T	T	T	T
D curve	2	150	300	500	700	1000	1500	2000	T	T	T	T
	3	40	63	300	500	700	1000	1500	T	T	T	T
	6		63	80	400	500	700	800	3000	T	T	T
	10				100	350	500	600	1800	3000	4000	T
	16						340	450	1000	2000	3300	3700
	20							200	1000	1600	2500	3700
	25								800	1300	2100	3700
	32									1000	1800	2700
	40										1600	2400
	40											

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: C120N/H, B curve

Downstream: C120N/H,
B, C, D curves

Upstream		C120N/H										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C120N/H B curve	10			80	100	125	160	200	250	320	400	500
	16					125	160	200	250	320	400	500
	20						160	200	250	320	400	500
	25							200	250	320	400	500
	32								250	320	400	500
	40									320	400	500
	50										400	500
	63											500
	80											
	100											
	125											
Discrimination limit (A)												
C120N/H C curve	10					125	160	200	250	320	400	500
	16								250	320	400	500
	20								250	320	400	500
	25										400	500
	32											500
	40											
	50											
	63											
	80											
	100											
	125											
Discrimination limit (A)												
C120N/H D curve	10							200	250	320	400	500
	16									320	400	500
	20										400	500
	25											500
	32											
	40											
	50											
	63											
	80											
	100											
	125											

400

Discrimination limit = 400 A.



No discrimination.

Upstream		C120N/H										
		C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
B curve	iDPN	6	125	170	400	500	700	800	3000	T	T	T
	B curve	10		160	200	350	500	600	1800	3000	T	T
		16			200	270	340	450	1250	2000	3300	3700
		20				250	320	400	1000	1600	2500	3700
		25					320	400	800	1300	2100	3700
		32						400	600	1000	1800	2700
		40							500	700	1600	2400
		Discrimination limit (A)										
C curve	iDPN	1	300	500	700	1000	1500	2000	2500	4500	4500	4500
	C curve	2	150	300	500	700	1000	1500	2000	4500	4500	4500
		3	120	200	300	500	700	1000	1500	4500	4500	4500
		6	120	200	240	400	500	700	800	3000	4500	4500
		10		200	240	300	400	500	600	1800	3000	4500
		16			300	400	500	600	1000	2000	3300	3700
		20					500	600	1000	1600	2500	3700
		25						600	800	1300	2100	3700
		32							800	1000	1800	2700
		40							800	1000	1600	2400
		Discrimination limit (A)										
D curve	iDPN	1	300	500	700	1000	1500	2000	2500	4500	4500	4500
	D curve	2	150	300	500	700	1000	1500	2000	4500	4500	4500
		3	120	200	300	500	700	1000	1500	4500	4500	4500
		6				400	500	700	800	3000	4500	4500
		10					500	600	1800	3000	4500	4500
		16							1000	2000	3300	3700
		20							1000	1600	2500	3700
		25								1300	2100	3700
		32									1800	2700
		40										2400

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: C120N/H, C curve

Downstream: C120N/H,
B, C, D curves

Upstream		C120N/H C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C120N/H B curve	10			160	200	250	320	400	500	630	800	1000
	16				200	250	320	400	500	630	800	1000
	20					250	320	400	500	630	800	1000
	25							400	500	630	800	1000
	32								500	630	800	1000
	40								500	630	800	1000
	50									630	800	1000
	63											1000
	80											
	100											
	125											
Discrimination limit (A)												
C120N/H C curve	10				200	250	320	400	500	630	800	1000
	16					250	320	400	500	630	800	1000
	20						320	400	500	630	800	1000
	25							400	500	630	800	1000
	32								500	630	800	1000
	40									630	800	1000
	50										800	1000
	63											1000
	80											
	100											
	125											
Discrimination limit (A)												
C120N/H D curve	10					250	320	400	500	630	800	1000
	16							400	500	630	800	1000
	20								500	630	800	1000
	25									630	800	1000
	32										800	1000
	40											1000
	50											
	63											
	80											
	100											
	125											

400

Discrimination limit = 400 A.



No discrimination.

Upstream		C120N/H										
		D curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
B curve	iDPN 6	125	250	250	400	500	630	800	3000	T	T	T
	10		250	250	200	500	630	800	1800	3000	T	T
	16			250	400	500	630	800	1250	2000	3300	3700
	20				400	500	630	800	1000	1600	2500	3700
	25					500	630	800	1000	1250	2100	3700
	32						630	800	1000	1250	1800	2700
	40								1000	1250	1600	2400
Discrimination limit (A)												
C curve	iDPN 1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	125	200	250	400	500	700	800	3000	4500	4500	4500
	6	125	250	250	400	500	630	800	3000	4500	4500	4500
	10		250	250	200	500	630	800	1800	3000	4500	4500
	16			250	400	500	630	800	1250	2000	3300	3700
	20				400	500	630	800	1000	1600	2500	3700
	25					500	630	800	1000	1250	2100	3700
	32						630	800	1000	1250	1800	2700
	40								1000	1250	1600	2400
Discrimination limit (A)												
D curve	iDPN 1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	120	200	300	500	700	1000	1500	4500	4500	4500	4500
	6		250	240	400	500	630	800	3000	4500	4500	4500
	10			240	200	500	630	800	1800	3000	4500	4500
	16				400	500	630	800	1250	2000	3300	3700
	20					500	630	800	1000	1600	2500	3700
	25						630	800	1000	1250	2100	3700
	32							800	1000	1250	1800	2700
	40								1000	1250	1600	2400

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: C120N/H, D curve

Downstream: C120N/H,
B, C, D curves

Upstream		C120N/H										
		D curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C120N/H B curve	10		192	240	300	384	480	600	756	960	1200	1500
	16				300	384	480	600	756	960	1200	1500
	20					384	480	600	756	960	1200	1500
	25							600	756	960	1200	1500
	32								756	960	1200	1500
	40									960	1200	1500
	50									960	1200	1500
	63										1200	1500
	80											1500
	100											
	125											
Discrimination limit (A)												
C120N/H C curve	10				300	384	480	600	756	960	1200	1500
	16					384	480	600	756	960	1200	1500
	20						480	600	756	960	1200	1500
	25							600	756	960	1200	1500
	32								756	960	1200	1500
	40									960	1200	1500
	50									960	1200	1500
	63											1500
	80											1500
	100											
	125											
Discrimination limit (A)												
C120N/H D curve	10				300	384	480	600	756	960	1200	1500
	16							600	756	960	1200	1500
	20							600	756	960	1200	1500
	25								756	960	1200	1500
	32								756	960	1200	1500
	40									960	1200	1500
	50									960	1200	1500
	63											1500
	80											1500
	100											
	125											

400

Discrimination limit = 400 A.



No discrimination.

Upstream		NG125N/H/L										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
iDPN B curve	6		63	80	400	500	700	800	3000	T	T	T
	10			80	100	100	500	600	1800	3000	T	T
	16				100	125	160	200	1000	2000	3300	3750
	20					125	160	200	1000	1600	2500	3700
	25						160	200	800	1300	2100	3700
	32							200	600	1000	1800	2700
	40									320	1600	2400
Discrimination limit (A)												
iDPN C curve	1	300	500	700	1000	1500	2000	2500	T	T	T	T
	2	150	300	500	700	1000	1500	2000	T	T	T	T
	3	40	63	300	500	700	1000	1600	T	T	T	T
	6		63	80	400	500	700	800	3000	T	T	T
	10				100	350	500	600	1800	3000	4000	T
	16					125	340	450	1000	2000	3300	3700
	20						160	200	1000	1600	2500	3700
	25							200	800	1300	2100	3700
	32								600	1000	1800	2700
	40									320	1600	2400
Discrimination limit (A)												
C120N/H B curve	10			80	100	125	160	200	250	320	400	500
	16				100	125	160	200	250	320	400	500
	20					125	160	200	250	320	400	500
	25							200	250	320	400	500
	32								250	320	400	500
	40									250	320	400
	50									320	400	500
	63											500
	80											500
	100											
	125											
Discrimination limit (A)												
C120N/H C curve	10					125	160	200	250	320	400	500
	16							200	250	320	400	500
	20								250	320	400	500
	25									320	400	500
	32										400	500
	40											
	50											
	63											
	80											
	100											
Discrimination limit (A)												
C120N/H D curve	10							200	250	320	400	500
	16									320	400	500
	20										400	500
	25											500
	32											
	40											
	50											
	63											
	80											
	100											
	125											

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: NG125N/H/L, C curve

Downstream: iDPN, C120N/H,
B, C, D curves

Upstream		NG125N/H/L										
		C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
iDPN	6			170	400	500	700	800	3000	T	T	T
B curve	10				200	350	500	600	1800	3000	T	T
	16					270	340	450	1250	2000	3300	3700
	20						320	400	1000	1600	2500	3700
	25							400	800	1300	2100	3700
	32								600	1000	1800	2700
	40									700	1600	2400
Discrimination limit (A)												
iDPN	1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
C curve	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	120	200	300	500	700	1000	1500	4500	4500	4500	4500
	6	120	200	240	400	500	700	800	3000	4500	4500	4500
	10		200	240	300	400	500	600	1800	3000	4500	4500
	16				300	400	500	600	1000	2000	3300	3700
	20						500	600	1000	1600	2500	3700
	25							600	800	1300	2100	3700
	32								800	1000	1800	2700
	40								800	1000	1600	2400
Discrimination limit (A)												
iDPN	1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
D curve	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	120	200	300	500	700	1000	1500	4500	4500	4500	4500
	6				400	500	700	800	4500	4500	4500	4500
	10						500	600	1800	3000	4500	4500
	16								1000	2000	3300	3700
	20								1000	1600	2500	3700
	25									1300	2100	3700
	32										1800	2700
	40											2400
Discrimination limit (A)												
C120N/H	10			170	212	272	340	425	535	680	850	1062
B curve	16				212	272	340	425	535	680	850	1062
	20					272	340	425	535	680	850	1062
	25						340	425	535	680	850	1062
	32								535	680	850	1062
	40								535	680	850	1062
	50									680	850	1062
	63										850	1062
	80											1062
	100											
	125											
Discrimination limit (A)												
C120N/H	10				212	272	340	425	535	680	850	1062
C curve	16				212	272	340	425	535	680	850	1062
	20					272	340	425	535	680	850	1062
	25							425	535	680	850	1062
	32								535	680	850	1062
	40								535	680	850	1062
	50									680	850	1062
	63										850	1062
	80											1062
	100											
	125											
Discrimination limit (A)												
C120N/H	10					272	340	425	535	680	850	1062
D curve	16						340	425	535	680	850	1062
	20							425	535	680	850	1062
	25								535	680	850	1062
	32									680	850	1062
	40										850	1062
	50											1062
	63											
	80											
	100											
	125											

400

Discrimination limit = 400 A.

No discrimination.

Upstream		NG125N/H/L										
		D curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
iDPN B curve	6	125	250	250	400	500	630	800	3000	T	T	T
	10		250	250	400	500	630	800	1800	3000	T	T
	16			250	400	500	630	800	1250	2000	3300	3700
	20				400	500	630	800	1000	1600	2500	3700
	25					500	630	800	1000	1250	2100	3700
	32						630	800	1000	1250	1800	2700
	40								1000	1250	1600	2400
Discrimination limit (A)												
iDPN C curve	1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	125	200	250	400	500	700	800	3000	4500	4500	4500
	6	125	250	250	400	500	630	800	3000	4500	4500	4500
	10		250	250	200	500	630	800	1800	3000	4500	4500
	16			250	400	500	630	800	1250	2000	3300	3700
	20				400	500	630	800	1000	1600	2500	3700
	25					500	630	800	1000	1250	2100	3700
	32						630	800	1000	1250	1800	2700
	40								1000	1250	1600	2400
Discrimination limit (A)												
iDPN D curve	1	300	500	700	1000	1500	2000	2500	4500	4500	4500	4500
	2	150	300	500	700	1000	1500	2000	4500	4500	4500	4500
	3	120	200	300	500	700	1000	1500	4500	4500	4500	4500
	6		250	240	400	500	630	800	3000	4500	4500	4500
	10			240	200	500	630	800	1800	3000	4500	4500
	16				400	500	630	800	1250	2000	3300	3700
	20						630	800	1000	1600	2500	3700
	25							800	1000	1250	2100	3700
	32							800	1000	1250	1800	2700
	40								1000	1250	1600	2400
Discrimination limit (A)												
C120N/H B curve	10			240	300	384	480	600	756	960	1200	1500
	16				300	384	480	600	756	960	1200	1500
	20						480	600	756	960	1200	1500
	25							600	756	960	1200	1500
	32								756	960	1200	1500
	40								756	960	1200	1500
	50									960	1200	1500
	63											1500
	80											
	100											
	125											
Discrimination limit (A)												
C120N/H C curve	10				300	384	480	600	756	960	1200	1500
	16					384	480	600	756	960	1200	1500
	20						480	600	756	960	1200	1500
	25							600	756	960	1200	1500
	32								756	960	1200	1500
	40								756	960	1200	1500
	50									960	1200	1500
	63											1500
	80											
	100											
Discrimination limit (A)												
C120N/H D curve	10				300	384	480	600	756	960	1200	1500
	16					384	480	600	756	960	1200	1500
	20						480	600	756	960	1200	1500
	25							600	756	960	1200	1500
	32								756	960	1200	1500
	40								756	960	1200	1500
	50									960	1200	1500
	63											1500
	80											
	100											
	125											

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: NG125, C120, B curve

Downstream: C60, B, C, D, Z, K,
MA curves

Upstream		NG125N/H/L, C120N/H										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C60N B, C curves	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	550	700	1500	2200	3100	3500	4000	T	T	T	T
	2	300	450	700	1500	2100	2500	2800	4500	T	T	T
	3	150	300	300	950	1500	1600	1800	4000	T	T	T
	4		150	200	600	1200	1300	1400	3400	T	T	T
	6			150	400	950	1000	1000	2800	5000	T	T
	10					600	600	750	2500	4000	5500	T
	16							600	2100	3500	4500	5500
	20									2500	3500	4500
	25									1600	2500	3500
	32											2800
	40											2500
	50 /63											
Discrimination limit (A)												
C60H/L B, C, Z curves	0.5	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
	0.75	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
	1	550	700	1500	2200	3100	3500	4000	6000	7000	10000	10000
	2	300	450	700	1500	2100	2500	2800	4500	6000	8000	10000
	3	150	300	300	950	1500	1600	1800	4000	6000	7000	10000
	4		150	200	600	1200	1300	1400	3400	6000	6000	8000
	6			150	400	950	1000	1000	2800	5000	6000	6500
	10					600	600	750	2500	4000	5500	6000
	16							600	2100	3500	4500	5500
	20									2500	3500	4500
	25									1600	2500	3500
	32											2800
	40											2500
	50 /63											
Discrimination limit (A)												
C60N D curve	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	550	700	1500	2200	3100	3500	4000	T	T	T	T
	2		450	700	1500	2100	2500	2800	4500	T	T	T
	3			300	950	1500	1600	1800	4000	T	T	T
	4					1200	1300	1400	3400	T	T	T
	6							1000	2800	5000	T	T
	10									4000	5500	T
	16									3500	4500	5500
	20											4500
	25											3500
	32											
	40											
	50 /63											
Discrimination limit (A)												
C60H/L D, K, MA curves	1	550	700	1500	2200	3100	3500	4000	6000	7000	10000	10000
	2		450	700	1500	2100	2500	2800	4500	6000	8000	10000
	3			300	950	1500	1600	1800	4000	6000	7000	10000
	4					1200	1300	1400	3400	6000	6000	8000
	6							1000	2800	5000	6000	6500
	10									4000	5500	6000
	16									3500	4500	5500
	20											4500
	25											3500
	32											
	40											
	50 /63											

The above tables indicate the discrimination limits in the following cases:

- phase-to-neutral short-circuit on a 230 V single-phase distribution network, downstream of a 3 Ph + N or single-phase network.
- short-circuit between two phases on a three-phase distribution network with a nominal voltage of 230 V.

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400 Discrimination limit = 400 A.

No discrimination.

Upstream		NG125N/H/L, C120N/H										
		C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C60N	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
B, C curves	1	800	1000	2000	3000	4500	T	T	T	T	T	T
	2	400	600	1000	2000	3000	3500	4000	T	T	T	T
	3	200	400	400	1300	2100	2300	2500	T	T	T	T
	4		200	300	900	1600	1800	2000	T	T	T	T
	6			200	500	1300	1400	1500	4000	T	T	T
	10				300	800	900	1000	3500	T	T	T
	16					500	650	800	3000	5000	T	T
	20						400	700	2000	3600	5500	T
	25							500	1000	2200	3500	5000
	32								700	1500	2500	4000
	40									1300	1800	3600
	50										1500	2500
	63											2100
Discrimination limit (A)												
C60H/L	0.5	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
	0.75	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
B, C, Z curves	1	800	1000	2000	3000	4500	5500	7000	10000	10000	10000	10000
	2	400	600	1000	2000	3000	3500	4000	6000	10000	10000	10000
	3	200	400	400	1300	2100	2300	2500	6000	10000	10000	10000
	4		200	300	900	1600	1800	2000	5000	8000	10000	10000
	6			200	500	1300	1400	1500	4000	6500	8500	10000
	10				300	800	900	1000	3500	6000	6500	8000
	16					500	650	800	3000	5000	6000	7000
	20						400	700	2000	3600	5500	6000
	25							500	1000	2200	3500	5000
	32								700	1500	2500	4000
	40									1300	1800	3600
	50										1500	2500
	63											2100
Discrimination limit (A)												
C60N	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
D curve	1	800	1000	2000	3000	4500	T	T	T	T	T	T
	2		600	1000	2000	3000	3500	4000	T	T	T	T
	3			400	1300	2100	2300	2500	T	T	T	T
	4				900	1600	1800	2000	T	T	T	T
	6					1300	1400	1500	4000	T	T	T
	10						900	1000	3500	T	T	T
	16							800	3000	5000	T	T
	20								2000	3600	5500	T
	25									2200	3500	5000
	32										2500	4000
	40											3600
	50 /63											
Discrimination limit (A)												
C60H/L	1	800	1000	2000	3000	4500	5500	7000	10000	10000	10000	10000
	2		600	1000	2000	3000	3500	4000	8000	10000	10000	10000
D, K, MA curves	3			400	1300	2100	2300	2500	7000	10000	10000	10000
	4				900	1600	1800	2000	5000	8000	10000	10000
	6					1300	1400	1500	4000	6500	8500	10000
	10						900	1000	3500	5500	6500	8000
	16							800	3000	5000	6000	7000
	20								2000	3600	5500	6000
	25									2200	3500	5000
	32										2500	4000
	40											3600
	50 /63											

The above tables indicate the discrimination limits in the following cases:

- phase-to-neutral short-circuit on a 230 V single-phase distribution network, downstream of a 3 Ph + N or single-phase network.
- short-circuit between two phases on a three-phase distribution network with a nominal voltage of 230 V.

T

Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400

Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: NG125, C120, D curve

Downstream: C60, B, C, D, Z, K,
MA curves

Upstream		NG125N/H/L, C120N/H										
		D curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C60N B, C curves	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	900	1100	2300	3400	5000	6000	T	T	T	T	T
	2	450	700	1100	2300	3400	4000	4500	6000	T	T	T
	3	250	450	450	1500	2400	2600	2800	6000	T	T	T
	4		200	350	1000	1800	2000	2300	6000	T	T	T
	6			250	600	1500	1600	1700	4500	6000	T	T
	10				350	900	1000	1200	4000	6000	T	T
	16					600	750	900	3400	5600	6000	T
	20						500	800	2300	4000	6000	T
	25							600	1200	2500	4000	5500
	32								800	1700	2800	4500
	40								600	1500	2200	4000
	50										1700	2800
	63											2300
Discrimination limit (A)												
C60H/L B, C, Z curves	0.5	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
	0.75	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
	1	900	1100	2300	3400	5000	6000	7000	10000	10000	10000	10000
	2	450	700	1100	2300	3400	4000	4500	8000	10000	10000	10000
	3	250	450	450	1500	2400	2600	2800	7000	8000	10000	10000
	4		200	350	1000	1800	2000	2300	6000	6500	10000	10000
	6			250	600	1500	1600	1700	4500	6000	8500	10000
	10				350	900	1000	1200	4000	6000	6500	10000
	16					600	750	900	3400	5600	6000	8000
	20						500	800	2300	4000	6000	7000
	25							600	1200	2500	4000	5500
	32								800	1700	2800	4500
	40								600	1500	2200	4000
	50										1700	2800
	63											2300
Discrimination limit (A)												
C60N D curve	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	900	1100	2300	3400	5000	6000	T	T	T	T	T
	2		700	1100	2300	3400	4000	4500	6000	T	T	T
	3			450	1500	2400	2600	2800	6000	T	T	T
	4				1000	1800	2000	2300	6000	T	T	T
	6					1500	1600	1700	4500	6000	T	T
	10						1000	1200	4000	6000	T	T
	16							900	3400	5600	6000	T
	20								2300	4000	6000	T
	25								1200	2500	4000	5500
	32										2800	4500
	40											4000
	50											
	63											
Discrimination limit (A)												
C60H/L D, K, MA curves	1	900	1100	2300	3400	5000	6000	10000	10000	10000	10000	10000
	2		700	1100	2300	3400	4000	4500	8000	10000	10000	10000
	3			450	1500	2400	2600	2800	7000	8000	10000	10000
	4				1000	1800	2000	2300	6000	6500	10000	10000
	6					1500	1600	1700	4500	6000	8500	10000
	10						1000	1200	4000	6000	6500	10000
	16							900	3400	5600	6000	8000
	20								2300	4000	6000	7000
	25								1200	2500	4000	5500
	32										2800	4500
	40											4000
	50 / 63											

The above tables indicate the discrimination limits in the following cases:

- phase-to-neutral short-circuit on a 230 V single-phase distribution network, downstream of a 3 Ph + N or single-phase network.
- short-circuit between two phases on a three-phase distribution network with a nominal voltage of 230 V.

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400 Discrimination limit = 400 A.

No discrimination.

Upstream		NG125N/H/L, C120N/H										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C60N B, C curves	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	200	300	450	700	1000	1300	1600	2800	3500	5000	T
	2	100	220	300	450	550	900	1260	2500	3000	4500	T
	3	60	150	220	350	450	700	1150	2300	2600	4000	4500
	4		100	150	250	400	650	1000	2000	2300	3300	4000
	6			120	200	300	500	700	1750	2000	3000	3500
	10					200	300	600	1100	1500	2600	3300
	16							450	700	1000	2300	2900
	20									800	1900	2500
	25									700	1700	2200
	32											1550
	40											1100
	50											
	63											
Discrimination limit (A)												
C60H/L B, C, Z curves	0.5	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	0.75	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	1	200	300	450	700	1000	1300	1600	2800	3500	5000	6000
	2	100	220	300	450	550	900	1260	2500	3000	4500	6000
	3	60	150	220	350	450	700	1150	2300	2600	4000	4500
	4		100	150	250	400	650	1000	2000	2300	3300	4000
	6			120	200	300	500	700	1750	2000	3000	3500
	10					200	300	600	1100	1500	2600	3300
	16							450	700	1000	2300	2900
	20									800	1900	2500
	25									700	1700	2200
	32											1550
	40											1100
	50											
	63											
Discrimination limit (A)												
C60N D curve	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	200	300	450	700	1000	1300	1600	2800	3500	5000	T
	2		220	300	450	550	900	1260	2500	3000	4500	T
	3			220	350	450	700	1150	2300	2600	4000	4500
	4					400	650	1000	2000	2300	3300	4000
	6							700	1750	2000	3000	3500
	10									1500	2600	3300
	16									1000	2300	2900
	20											2500
	25											2200
	32											
	40											
	50 / 63											
Discrimination limit (A)												
C60H/L D, K, MA curves	1	200	300	450	700	1000	1300	1600	2800	3500	5000	6000
	2		220	300	450	550	900	1260	2500	3000	4500	6000
	3			220	350	450	700	1150	2300	2600	4000	4500
	4					400	650	1000	2000	2300	3300	4000
	6							700	1750	2000	3000	3500
	10									1500	2600	3300
	16									1000	2300	2900
	20											2500
	25											2200
	32											
	40											
	50 / 63											

The above tables indicate the discrimination limits in the following cases:
- short-circuit between two phases on a three-phase 230/400 V distribution network.

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination Upstream: NG125, C120, C curve Downstream: C60, B, C, D, Z, K, MA curves

Upstream		NG125N/H/L, C120N/H										
		C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)												
C60N B, C curves	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	300	450	600	1000	1600	2000	2500	T	T	T	T
	2	150	300	450	600	800	1300	2000	T	T	T	T
	3	80	200	300	450	600	1000	1600	5000	T	T	T
	4		160	250	350	500	1000	1600	4000	5000	T	T
	6			170	300	400	800	1200	2500	4000	T	T
	10				210	270	500	800	1000	3200	5000	T
	16					270	400	600	1000	1600	3600	5500
	20						340	500	800	1200	3000	4000
	25							420	600	1000	2500	3200
	32								530	1000	1600	2500
	40									680	1000	1600
	50										850	1300
	63											1200
Discrimination limit (A)												
C60H/L B, C, Z curves	0.5	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	0.75	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	1	300	450	600	1000	1600	2000	2500	6000	6000	6000	6000
	2	150	300	450	600	800	1300	2000	6000	6000	6000	6000
	3	80	200	300	450	600	1000	1600	5000	6000	6000	6000
	4		160	250	350	500	1000	1600	4000	5000	6000	6000
	6			170	300	400	800	1200	2500	4000	6000	6000
	10				210	270	500	800	1000	3200	5000	6000
	16					270	400	600	1000	1600	3600	5500
	20						340	500	800	1200	3000	4000
	25							420	600	1000	2500	3200
	32								530	1000	1600	2500
	40									680	1000	1600
	50										850	1300
	63											1200
Discrimination limit (A)												
C60N D curve	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
	1	300	450	600	1000	1600	2000	2500	T	T	T	T
	2		300	450	600	800	1300	2000	T	T	T	T
	3			300	450	600	1000	1600	5000	T	T	T
	4				350	500	1000	1600	4000	5000	T	T
	6					400	800	1200	2500	4000	T	T
	10						500	800	1000	3200	5000	T
	16							600	1000	1600	3600	5500
	20								800	1200	3000	4000
	25									1000	2500	3200
	32										1600	2500
	40											1600
	50											
	63											
Discrimination limit (A)												
C60H/L D, K, MA curves	1	300	450	600	1000	1600	2000	2500	6000	6000	6000	6000
	2		300	450	600	800	1300	2000	6000	6000	6000	6000
	3			300	450	600	1000	1600	5000	6000	6000	6000
	4				350	500	1000	1600	4000	5000	6000	6000
	6					400	800	1200	2500	4000	6000	6000
	10						500	800	1000	3200	5000	6000
	16							600	1000	1600	3600	5500
	20								800	1200	3000	4000
	25									1000	2500	3200
	32										1600	2500
	40											1600
	50											
	63											

The above tables indicate the discrimination limits in the following cases:

- short-circuit between two phases on a three-phase 230/400 V distribution network.

T

Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400

Discrimination limit = 400 A.

No discrimination.

Upstream		NG125N/H/L, C120N/H										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream	Rating											
Discrimination limit (A)												
C60N	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
B, C curves	1	400	550	900	1400	1900	2400	3000	T	T	T	T
	2	200	400	550	900	1200	1600	2100	T	T	T	T
	3	130	250	350	650	900	1300	1900	T	T	T	T
	4		140	270	450	700	1100	1700	4000	T	T	T
	6			220	400	600	900	1300	3000	4300	T	T
	10				260	500	600	900	2000	3300	T	T
	16					370	500	700	1400	2000	4300	T
	20						450	600	1100	1800	3500	4500
	25							500	1000	1300	3000	3600
	32								800	1300	1800	2600
	40								500	1000	1300	2200
	50										1100	1800
	63											1500
Discrimination limit (A)												
C60H/L	0.5	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	0.75	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
B, C, Z curves	1	400	550	900	1400	1900	2400	3000	6000	6000	6000	6000
	2	200	400	550	900	1200	1600	2100	6000	6000	6000	6000
	3	130	250	350	650	900	1300	1900	6000	6000	6000	6000
	4		140	270	450	700	1100	1700	4000	6000	6000	6000
	6			220	400	600	900	1300	3000	4300	6000	6000
	10				260	500	600	900	2000	3300	6000	6000
	16					370	500	700	1400	2000	4300	6000
	20						450	600	1100	1800	3500	4500
	25							500	1000	1300	3000	3600
	32								800	1300	1800	2600
	40								500	1000	1300	2200
	50										1100	1800
	63											1500
Discrimination limit (A)												
C60N	0.5	T	T	T	T	T	T	T	T	T	T	T
	0.75	T	T	T	T	T	T	T	T	T	T	T
D curve	1	400	550	900	1400	1900	2400	3000	T	T	T	T
	2	200	400	550	900	1200	1600	2100	T	T	T	T
	3		250	350	650	900	1300	1900	4000	T	T	T
	4			270	450	700	1100	1700	3000	4300	T	T
	6				400	600	900	1300	2000	3300	T	T
	10					500	600	900	1400	2000	4300	T
	16						500	700	1100	1800	3500	4500
	20								1000	1300	3000	3600
	25									1300	1800	2600
	32										1300	2200
	40											1800
	50											
	63											
Discrimination limit (A)												
C60H/L	1	400	550	900	1400	1900	2400	3000	6000	6000	6000	6000
	2	200	400	550	900	1200	1600	2100	6000	6000	6000	6000
D, K, MA curves	3		250	350	650	900	1300	1900	6000	6000	6000	6000
	4			270	450	700	1100	1700	4000	6000	6000	6000
	6				400	600	900	1300	3000	4300	6000	6000
	10					500	600	900	2000	3300	6000	6000
	16						500	700	1400	2000	4300	6000
	20								1100	1800	3500	4500
	25								1000	1300	3000	3600
	32									1300	1800	2600
	40										1300	2200
	50											1800
	63											

The above tables indicate the discrimination limits in the following cases:
- short-circuit between two phases on a three-phase 230/400 V distribution network.

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: NG125, C120, B, C curves

Downstream: NG125, C120,
B, C, D curves

Upstream		NG125N/H/L, C120N/H										
		B curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)		40	64	80	100	128	160	200	252	320	400	500
NG125, C120 B curve	10	T	T	T	T	T	T	T	T	T	T	T
	16				T	T	T	T	T	T	T	T
	20					T	T	T	T	T	T	T
	25						T	T	T	T	T	T
	32							T	T	T	T	T
	40								T	T	T	T
	50									T	T	T
	63										T	T
	80											T
	100											
	125											
Discrimination limit (A)		40	64	80	100	128	160	200	252	320	400	500
NG125, C120 C curve	10					T	T	T	T	T	T	T
	16							T	T	T	T	T
	20								T	T	T	T
	25									T	T	T
	32										T	T
	40											T
	50											
	63											
Discrimination limit (A)		40	64	80	100	128	160	200	252	320	400	500
NG125, C120 D curve	10							T	T	T	T	T
	16									T	T	T
	20										T	T
	25											T
	32											
	40											
	50											
	63											

Upstream		NG125N/H/L, C120N/H										
		C curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)		80	128	160	200	256	320	400	504	640	800	1000
NG125, C120 B curve	10		T	T	T	T	T	T	T	T	T	T
	16				T	T	T	T	T	T	T	T
	20					T	T	T	T	T	T	T
	25						T	T	T	T	T	T
	32							T	T	T	T	T
	40								T	T	T	T
	50									T	T	T
	63											T
	80											
	100											
	125											
Discrimination limit (A)		80	128	160	200	256	320	400	504	640	800	1000
NG125, C120 C curve	10		T	T	T	T	T	T	T	T	T	T
	16				T	T	T	T	T	T	T	T
	20					T	T	T	T	T	T	T
	25						T	T	T	T	T	T
	32							T	T	T	T	T
	40								T	T	T	T
	50									T	T	T
	63										T	T
	80											T
	100											
	125											
Discrimination limit (A)		80	128	160	200	256	320	400	504	640	800	1000
NG125, C120 D curve	10					T	T	T	T	T	T	T
	16						T	T	T	T	T	T
	20								T	T	T	T
	25									T	T	T
	32										T	T
	40											T
	50											
	63											
	80											
	100											
	125											

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

Upstream		NG125N/H/L, C120N/H										
		D curve										
In (A)		10	16	20	25	32	40	50	63	80	100	125
Downstream Rating												
Discrimination limit (A)		192	240	300	384	480	600	756	960	1200	1500	
NG125, C120 B curve	10	T	T	T	T	T	T	T	T	T	T	T
	16			T	T	T	T	T	T	T	T	T
	20				T	T	T	T	T	T	T	T
	25					T	T	T	T	T	T	T
	32						T	T	T	T	T	T
	40							T	T	T	T	T
	50								T	T	T	T
	63									T	T	T
	80										T	T
	100											T
	100											
Discrimination limit (A)		192	240	300	384	480	600	756	960	1200	1500	
NG125, C120 C curve	10	T	T	T	T	T	T	T	T	T	T	T
	16			T	T	T	T	T	T	T	T	T
	20				T	T	T	T	T	T	T	T
	25					T	T	T	T	T	T	T
	32						T	T	T	T	T	T
	40							T	T	T	T	T
	50								T	T	T	T
	63									T	T	T
	80										T	T
	100											T
	100											
Discrimination limit (A)		192	240	300	384	480	600	756	960	1200	1500	
NG125, C120 D curve	10	T	T	T	T	T	T	T	T	T	T	T
	16			T	T	T	T	T	T	T	T	T
	20				T	T	T	T	T	T	T	T
	25					T	T	T	T	T	T	T
	32						T	T	T	T	T	T
	40							T	T	T	T	T
	50								T	T	T	T
	63									T	T	T
	80										T	T
	100											T
	100											

T Total discrimination, up to the breaking capacity of the downstream circuit breaker.

Complementary Technical Information Circuit breakers

Protection Discrimination

Upstream: C60, C120, D, K curves
Downstream: iDPN, iDPN Vigi,
B, C curves

Upstream		C60L K curve											
Downstream In (A)		2	3	4	6	10	16	20	25	32	40	50	63
Discrimination limit (A)													
C60N/H	0.5/0.75	24	36	48	72	120	192	240	300	384	480	600	756
D curve	1	24	36	48	72	120	192	240	300	384	480	600	756
C60L	1.6			48	72	120	192	240	300	384	480	600	756
K curve	2			48	72	120	192	240	300	384	480	600	756
	3				72	120	192	240	300	384	480	600	756
	4					120	192	240	300	384	480	600	756
	6							240	300	384	480	600	756
	10								300	384	480	600	756
	16									384	480	600	756
	20										480	600	756
	25											600	756
	32												756
	40												
Upstream		C60 Curves D or K											
Downstream In (A)		2	3	4	6	10	16	20	25	32	40	50	63
Discrimination limit (A)													
iDPN	6/10						192	240	300	384	480	600	756
B curve	16									384	480	600	756
	20										480	600	756
	25										480	600	756
	32												756
	40												
Discrimination limit (A)													
iDPN/	1	24	36	48	72	120	192	240	300	384	480	600	756
iDPN Vigi	2			48	72	120	192	240	300	384	480	600	756
C curve	3				72	120	192	240	300	384	480	600	756
	4				72	120	192	240	300	384	480	600	756
	5					120	192	240	300	384	480	600	756
	6						192	240	300	384	480	600	756
	10							240	300	384	480	600	756
	16									384	480	600	756
	20										480	600	756
	25											600	756
	32												756

400 Discrimination limit = 400 A.

No discrimination.

Upstream		C60L B curve													
Downstream In (A)		2	3	4	6	10	16	20	25	32	40	50	63		
Discrimination limit (A)															
C60L	1	8	12	16	24	40	64	80	100	128	160	200	240		
	1.6		12	16	24	40	64	80	100	128	160	200	240		
Z curve	2			16	24	40	64	80	100	128	160	200	240		
	3				24	40	64	80	100	128	160	200	240		
	4				24	40	64	80	100	128	160	200	240		
	6					40	64	80	100	128	160	200	240		
	8						64	80	100	128	160	200	240		
	10						64	80	100	128	160	200	240		
	16								100	128	160	200	240		
	20									128	160	200	240		
	25										160	200	240		
	32											200	240		
	40												240		
	50														
Upstream		C60L C curve													
Downstream In (A)		2	3	4	6	10	16	20	25	32	40	50	63		
Discrimination limit (A)															
C60L	1	15	23	30	45	75	120	150	188	240	300	375	450		
	1.6		23	30	45	75	120	150	188	240	300	375	450		
Z curve	2			30	45	75	120	150	188	240	300	375	450		
	3				45	75	120	150	188	240	300	375	450		
	4				45	75	120	150	188	240	300	375	450		
	6					75	120	150	188	240	300	375	450		
	8						120	150	188	240	300	375	450		
	10						120	150	188	240	300	375	450		
	16								188	240	300	375	450		
	20									240	300	375	450		
	25										300	375	450		
	32											375	450		
	40												450		
	50													450	
Upstream		C60L K curve													
Downstream In (A)		2	3	4	6	10	16	20	25	32	40	50	63		
Discrimination limit (A)															
C60L	1	24	36	48	72	120	192	240	300	384	480	600	720		
	1.6		36	48	72	120	192	240	300	384	480	600	720		
Z curve	2			48	72	120	192	240	300	384	480	600	720		
	3				72	120	192	240	300	384	480	600	720		
	4				72	120	192	240	300	384	480	600	720		
	6					120	192	240	300	384	480	600	720		
	8						192	240	300	384	480	600	720		
	10						192	240	300	384	480	600	720		
	16								300	384	480	600	720		
	20									384	480	600	720		
	25										480	600	720		
	32											600	720		
	40												720		
	50													720	
Upstream		C60L Z curve													
Downstream In (A)		1.6	2	3	4	6	8	10	16	20	25	32	40	50	63
Discrimination limit (A)															
C60L	1	4	8.6	9	12	18	24	30	48	60	75	96	120	150	189
	1.6		8.6	9	12	18	24	30	48	60	75	96	120	150	189
Z curve	2					18	24	30	48	60	75	96	120	150	189
	3					18	24	30	48	60	75	96	120	150	189
	4					18	24	30	48	60	75	96	120	150	189
	6						24	30	48	60	75	96	120	150	189
	8							30	48	60	75	96	120	150	189
	10								60	75	96	120	150	189	
	16									75	96	120	150	189	
	20										96	120	150	189	
	25											120	150	189	
	32												150	189	
	40/50													189	

400 Discrimination limit = 400 A.

No discrimination.

Complementary Technical Information Circuit breakers

Choosing a circuit-breaker for circuits supplied with DC current

The choice of circuit-breaker type, for protection of a DC installation, depends mainly on the following criteria:

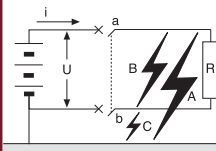
- nominal current which is used to choose current rating
- nominal voltage which is used to determine the number of serial-connected poles contributing to breaking
- the maximum short-circuit current at the installation point, used to define breaking capacity
- the type of network (see below)

types of network

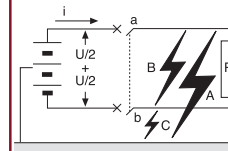
diagrams and
various
possible faults

earthed networks

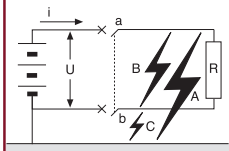
the source has an
earthed polarity



the source has an earthed
mid-point



unearthed networks



analysis of each fault	fault A	maximum I _{sc} only the positive polarity is concerned	I _{sc} close to maximum I _{sc} only the positive polarity is concerned at half voltage U/2	no effect
	fault B	maximum I _{sc} both polarities are concerned	maximum I _{sc} both polarities are concerned	maximum I _{sc} both polarities are concerned
	fault C	no effect	same as fault A but this time the negative polarity is concerned	no effect
the most unfavourable case	fault A	faults A and C	faults A and C	fault B
distribution of the breaking poles	all the poles effectively contributing to breaking are serial-connected on the positive polarity ^{(1) (2)}	on each polarity provide the number of poles required to break maximum I _{sc} at voltage U/2	on each polarity provide the number of poles required to break maximum I _{sc} at voltage U/2	distribute the number of poles required for breaking on each polarity

(1) or negative if it is the positive polarity that is earthed

(2) provide an additional pole on the earthed polarity if the aim is isolation

short-circuit current at the terminals of an accumulator battery

When its terminals are short-circuited, an accumulator battery delivers a current given by Ohm's law:

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

V_b = maximum discharge voltage (battery charged at 100 %)

R_i = internal resistance equivalent to all the cells (value normally given by the manufacturer according to battery Ampere/hour capacity).

Example

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

- capacity: 500 Ah
- maximum discharge voltage: 240 V (110 x 2.2 V cells)
- discharge current: 300 A
- backup time: 1/2 hour
- internal resistance: 0.5 mΩ per cell

240 V DC
300 A
500 Ah
R_i = 0.5 mΩ /cell



Answer

$$R_i = 110 \times 0.5 \cdot 10^{-3} = 55 \cdot 10^{-3}$$

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

As shown in the calculation above, short-circuit currents are relatively small.

Note: if internal resistance is not known, the following approximate formula can be used:

I_{sc} = kC where C is the battery capacity expressed in Ampere/hour and k is a coefficient close to 10 and in all cases always less than 20.

choosing DC circuit-breakers

type	rated current (A)	breaking capacity (kA) (L/R ≤ 0.015 s) (the number of poles contributing to breaking is given in brackets)							overload protection (thermal)	magnetic threshold overrating coefficient
		24/48 V	60 V	125 V	125 V	250 V	500 V	750 V		
multi 9										
C32H-DC ⁽¹⁾	1-2-3-6-10-16-20-25-32-40	20 (1P)		10 (1P)	20 (2P)	10 (2P)			special DC	special DC
C60a	10-16-20-25-32-40	10 (1P)		10 (2P)	20 (3P)	25 (4P)			ditto AC	1.38
C60N	6-10-16-20-25-32-40-50-63	15 (1P)		20 (2P)	30 (3P)	40 (4P)			ditto AC	1.38
C60H	1-2-3-4-6-10-16-20-25-32-40-50-63	20 (1P)		25 (2P)	40 (3P)	50 (4P)			ditto AC	1.38
C60L	1-2-3-4-6-10-16-20-25-32-40-50-63	25 (1P)		30 (2P)	50 (3P)	60 (4P)			ditto AC	1.38
C120N	63-80-100-125	10 (1P)		10 (1P)		10 (2P)			ditto AC	1.4
C120H	10-16-20-25-32-40-50-63-80-100-125	15 (1P)		15 (1P)		15 (2P)			ditto AC	1.4
NG125N	10-16-20-25-32-40-50-63-80-100-125		25 (1P)	25 (1P)		25 (2P)	25 (4P)		ditto AC	1.42
NG125H	10-16-20-25-32-40-50-63-80-100-125		36 (1P)	36 (1P)		36 (2P)	36 (4P)		ditto AC	1.42
NG125L	10-16-20-25-32-40-50-63-80-100-125		50 (1P)	50 (1P)		50 (2P)	50 (4P)		ditto AC	1.42
compact										
NS100N	16-25-40-63-80-100	50 (1P)		50 (1P)		50 (1P)	50 (2P)		protection by thermal magnetic trip identical to the trip units used in AC current	
NS100H	16-25-40-63-80-100	85 (1P)		85 (1P)		85 (1P)	85 (2P)			
NS100L	16-25-40-63-80-100	100 (1P)		100 (1P)		100 (1P)	100 (2P)			
NS160N	80-100-125-160	50 (1P)		50 (1P)		50 (1P)	50 (2P)			
NS160H	80-100-125-160	85 (1P)		85 (1P)		85 (1P)	85 (2P)			
NS160L	80-100-125-160	100 (1P)		100 (1P)		100 (1P)	100 (2P)			
NS250N	160-200-250	50 (1P)		50 (1P)		50 (1P)	50 (2P)			
NS250H	160-200-250	85 (1P)		85 (1P)		85 (1P)	85 (2P)			
NS250L	160-200-250	100 (1P)		100 (1P)		100 (1P)	100 (2P)		thermal inoperative, provide an external relay (if necessary)	special MP1/MP2/MP3 P21/P41 DC current ⁽²⁾ trip units
NS400H ⁽²⁾	MP1/MP2	85 (1P)		85 (1P)		85 (1P)	85 (2P)			
NS630H ⁽²⁾	MP1/MP2/MP3	85 (1P)		85 (1P)		85 (1P)	85 (2P)			
C1251N-DC ⁽²⁾	P21/P41-1250	50 (1P)		50 (1P)		50 (2P)	50 (3P)	25 (3P)		

(1) the C32H-DC special DC circuit-breaker is equipped with a permanent magnet, which requires strict respect of polarities

(2) for memory:

MP1 Im adjustable from 800 to 1600 A

MP2 Im adjustable from 1200 to 2500 A

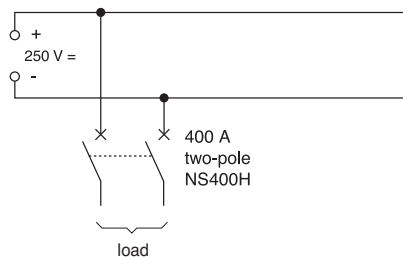
MP3 Im adjustable from 2000 to 4000 A

P21-1250 Im adjustable from 1600 to 3200 A

P41-1250 Im adjustable from 3200 to 6400 A

example

How to provide protection of a 400 A
outgoer on a 250 V DC unearthed
network: $I_{sc} = 35 \text{ kA}$?



The above chart informs us that a NS400H
(85 kA, 1P, 250 V) circuit-breaker must be used.
At least 2 poles must contribute to breaking
The chart on the previous page informs us
that the number of poles required for breaking
must be distributed over each polarity.

Complementary Technical Information Circuit breakers

Technical data for auxiliary contacts and releases

For *i* DPN, C60, C120, RCCB/ID

MN, MN^S, MX + OF, MX, MNx releases

Releases	MN				MN ^S
Cat. no.	26960	26961		26959	26963
Nominal line voltage (V) (+10, -20 %)	220 to 240	48	48	115	220 to 240
alternating current (AC)	■	■	-	■	■
direct current (DC)	-	-	■	-	-
Operating frequency 50/60 Hz	■	■	-	-	■
400 Hz	-	-	-	■	-
Min. cut-in voltage (V)	187	40.8	40.8	98	187
Min. tripping voltage (V)	between 0.35 and 0.70 Un				between 0.35 and 0.70 Un
Holding current (A)	0.014	0.034	0.022	0.017	0.015
Power consumption (VA)	3.3	1.6	1.1	2	3.4
Min. voltage dip time (ms)	30	8	8	30	> 300

Releases	MX+OF										
Cat. no.	26946					26947		26948			
Nominal line voltage (V) (+10, -20 %)	100	230	415	100	130	48	48	12	12	24	24
alternating current (AC)	■	■	■	-	-	■	-	■	-	■	-
direct current (DC)	-	-	-	■	■	-	■	-	■	-	■
Operating frequency 50/60 Hz	■	■	■	-	-	■	-	■	-	■	-
Min. cut-out voltage (V)	77	77	77	77	77	33.6	33.6	8.4	8.4	8.4	8.4
Inrush current (A)	0.4	0.8	1.5	0.3	0.3	1	0.7	4	2.5	7.7	5.6
Inrush power (VA)	44	184	625	38	45	48	33.6	48	30	185	135
Min. control impulse duration (ms)	8					8		8			
Power circuit breaking time (ms)	18					18		18			
OF contact rated operational current I _e (A)	see the auxiliary contact table on the next page F53										

Releases	MX										
Cat. no.	26476					26477		26478			
Nominal line voltage (V) (+10, -20 %)	100	230	415	100	130	48	48	12	12	24	24
alternating current (AC)	■	■	■	-	-	■	-	■	-	■	-
direct current (DC)	-	-	-	■	■	-	■	-	■	-	■
Operating frequency 50/60 Hz	■	■	■	-	-	■	-	■	-	■	-
Min. cut-out voltage (V)	77	77	77	77	77	33.6	33.6	8.4	8.4	8.4	8.4
Inrush current (A)	0.4	0.8	1.5	0.3	0.3	1	0.7	4	2.5	7.7	5.6
Inrush power (VA)	44	184	625	38	45	48	33.6	48	30	185	135
Min. control impulse duration (ms)	8					8		8			
Power circuit breaking time (ms)	18					18		18			

Releases	MNx		MNx	
		MNx C60		MNx C60
Cat. no.	26969	26977	26971	26991
Nominal line voltage (V) (+10, -20 %)	230	230	400	400
alternating current (AC)	■	■	■	■
direct current (DC)	-	-	-	-
Operating frequency 50/60 Hz	■	■	■	■
Min. tripping voltage (V)	100	100	280	280
Holding current (A)	0.014	0.014	0.014	0.014
Power consumption (VA)	3.3	3.3	5.6	5.6
Breaking time (ms)	20	20	20	20
Min. control circuit opening time (ms)	30	30	30	30

MSU releases

Releases	MSU	
Cat. no.	26479	26979
Nominal line voltage (V) (+10, -20 %)	230	230
alternating current (AC)	■	■
direct current (DC)	-	-
Operating frequency 50/60Hz	■	■
Operating threshold (V)	255 (-0, +5 %)	275 (-0, +5 %)
Holding current (A)	0.002	0.002
Inrush power (VA)	128	128
Power consumption (VA)	0.046	0.046
Breaking time (ms)	according to the curve	

OF, SD, OF + SD/OF, OF.S, OFsp auxiliary contacts

- Conform to EN 62019 for C60, C120 and *i* DPN (DPN).
- Degree of protection: IP20.
- Rating of auxiliary contact short-circuit protection device:
 - circuit-breaker: C60 / *i* DPN - 2P - C curve - 6 A - limitation class 3
 - fuse: 6 A, 500 V, type gG, 10.3 x 38 mm.

Contact rated operational current *I*_e (A) to IEC 60947-5:

Auxiliary contacts			OF, SD, OF + SD/OF, OF.S	OFsp
Cat. no.			26924/26927/ 26929/26923	16940
Rated operational Voltage <i>U</i> _e (V)	cat. AC12	380...415 V AC	3	-
		220...240 V AC	6	-
	cat. AC15	220...240 V AC	-	6
	cat. DC12	24 V DC	6	-
		48 V DC	2	-
		60 V DC	1,5	-
		130 V DC	1	-
		230 V DC	-	1
	cat. DC13	230 V DC	-	1

Common technical data of auxiliary contacts and releases

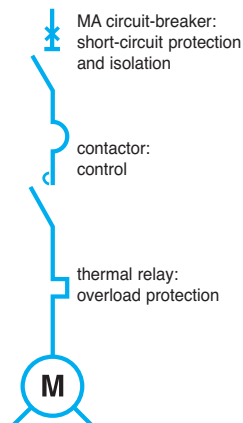
Common technical data	
Operating temperature when live (°C)	-25°C to +50°C
Storage temperature	-40°C to +85°C

Complementary Technical Information Circuit breakers

Motor Protection

circuit-breaker + contactor combination

(basic functions)



types of co-ordination

Standard IEC 60947.4 defines tests at various current levels with the aim of placing the switchgear in extreme conditions. According to the state of components after testing, the standard defines 2 types of coordination.

■ type 1:

Deterioration of the contactor and relay is accepted under 2 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 the protection and control switchgear are operational.

which type to choose?

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

■ type 1:

- qualified maintenance service,
- reduced volume and cost of switchgear,
- continuity of supply not required or ensured by replacing the faulty motor rack.

■ type 2:

- continuity of supply vital,
- reduced maintenance service,
- specifications stipulating type 2.

■ The various thermal relay classes: the thermal relay class must be appropriate for the motor starting time.

classes	tripping time at 7.2 Ir (s)
10/10 A	2 to 10
20	6 to 20

type 1 coordination

- circuit-breaker: Merlin Gerin
- contactors: Telemecanique
- standard: IEC 60947-4-1
- starting: normal (Class 10)
- breaking performance: equal to the breaking capacity of the circuit-breaker only
- temperature: 40 °C

motor				circuit-breaker		contactor		thermal relay		
220 to 230 V P(kW) I(A)		380 to 415 V P(kW) I(A)		415 V P(kW) I(A)		440 V ⁽¹⁾ P(kW) I(A)		type	Irth	
				1.1 2.5				NG125LMA 4	LC1-D09	LR2-D13 08 2.5 to 4
0.55 2.8		1.1 2.6		1.5 3.5		1.5 3.1		NG125LMA 4	LC1-D09	LR2-D13 08 2.5 to 4
1.1 4.4		2.2 5		2.2 4.8		2.2 4.5		NG125LMA 6.3	LC1-D09	LR2-D13 10 4 to 6
1.5 6.1		3 6.6		3 6.5		3 5.8		NG125LMA 10	LC1-D09	LR2-D13 12 5.5 to 8
2.2 8.7		4 8.5		4 8.2		4 7.9		NG125LMA 10	LC1-D09	LR2-D13 14 7 to 10
3 11.5		5.5 11.5		5.5 11		5.5 10.4		NG125LMA 12.5	LC1-D12	LR2-D13 16 9 to 13
4 14.5		7.5 15.5		7.5 14		7.5 13.7		NG125LMA 16	LC1-D18	LR2-D13 21 12 to 18
				9 17		9 16.9		NG125LMA 25	LC1-D18	LR2-D13 21 12 to 18
5.5 20		11 22		11 21		11 20.1		NG125LMA 25	LC1-D25	LR2-D13 22 17 to 25
7.5 28		15 30		15 28		15 26.5		NG125LMA 40	LC1-D32	LR2-D33 53 23 to 32
11 39		18.5 37		22 40		22 39		NG125LMA 63	LC1-D40	LR2-D33 57 37 to 50
		22 44		25 47				NG125LMA 63	LC1-D50	LR2-D33 57 37 to 50
15 52						30 51.5		NG125LMA 63	LC1-D50	LR2-D33 59 48 to 65
18.5 64		30 60				37 64		NG125LMA 80	LC1-D65	LR2-D33 59 48 to 65
				37 66				NG125LMA 80	LC1-D65	LR2-D33 61 55 to 70
22 75		37 72				45 76		NG125LMA 80	LC1-D80	LR2-D33 63 63 to 80

(1) 480 V Nema.

general

choosing motor supply cable cross-section

- motor starting current and permissible voltage drop are 2 factors to consider when choosing cable cross-section
- the cable must withstand a current at least equal, in continuous duty, to the sum of $I_n + I_d/3$ where:
 - I_n : rated current,
 - I_d : starting current (4 to 8 I_n) depending on the motor

voltage drop

- the accepted voltage drop from the incoming end of the installation to the motor in question is 5% for public distribution networks, and 8% for consumer and transformer substations
- if the machine to be driven has a small breakaway torque, it is sufficient to check voltage drop for the motor's rated current
- if breakaway torque is high (grain crushers, goods lifts, etc.), voltage drop must be checked for the starting current

protection the motor supply line

- all circuits and motors must be protected against overloads and short circuits

P25M motor protection circuit-breakers

function

- motor protection against overloads, short circuits and phase failure.
- each pole of the P25M motor protection circuit-breakers is equipped with:
 - a thermal release for overload protection
 - a magnetic release for short-circuit protection

protection

- in the case of high short-circuit currents, limiter blocks should be used for protection (see page A93)
- the breaking capacity of the P25M motor protection circuit-breakers is unlimited, and protection is pointless for the following ratings:
 - 0.16 to 1.6 A in 690 V
 - 0.16 to 4 A in 500 V
 - 0.16 to 10 A in 415 V
 - 0.16 to 18 A in 240 V

utilisation

- the P25M motor protection circuit-breakers are ideal for protecting the motors of small machine-tools and similar equipment, with local control (see table opposite)

setting the thermal releases

- thermal releases are set in the factory to the lower value of the setting range
- simultaneous setting of thermal releases takes place on the device front face
- we recommend that you set the thermal releases on the current that the motor draws in normal duty rather than on its rated current

auxiliaries

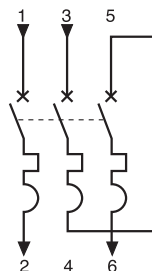
- the P25M motor protection circuit-breakers can be fitted with the following auxiliaries (no tools required):
 - position contacts
 - position contact + fault signal
 - shunt release or undervoltage release (emergency stop)

standardised powers (kW) of three-phase 50-60 Hz motors, in AC-3 category

rating (A)	voltage (V AC)					
	230	400	415	440	500	690
0.16	-	-	-	-	-	-
0.25	-	-	-	-	-	-
0.40	-	-	-	-	-	-
0.63	-	-	-	-	-	0.37
1	-	-	-	0.37	0.37	0.55
1.6	-	0.37	-	0.55	0.75	1.1
2.5	0.37	0.75	1.1	1.1	1.1	1.5
4	0.75	1.5	1.5	1.5	2.2	3
6.3	1.1	2.2	2.2	3	3.7	4
10	2.2	4	4	4	5.5	7.5
14	3	5.5	5.5	7.5	9	11
18	4	7.5	9	8	10	15
23	5.5	9	11	11	11	18.5
25	5.5	11	11	11	15	22

circuit-breaker connection for use with a single-phase motor

- two poles of the circuit-breaker must be connected in series



Poles connected in series

Network selection

Type	Earthed		Isolated from earth
Source	Earthed polarity (in this case negative)	Earthed central point	Isolated polarities
Protected polarities	1 (1P isolation)	2	2
Diagrams (and type of faults)	DB118854 	DB118855 	DB118856

Selection of supplementary protector and pole connection

24 V ≤ Un ≤ 250 V		Single-pole	Two-pole	Two-pole
Upstream connection		Only if L+ polarity is earthed	DB116735 	DB116735
Downstream connection	DB116732 	DB116738 	DB116738 	DB116738
250 V < Un ≤ 500 V		Two-pole	Two-pole	Two-pole
Upstream connection	DB116736 	DB116735 	DB116735 	DB116735
Downstream connection	DB116737 	DB116738 	DB116738 	DB116738

Fault analysis (low earth connection resistance)

Fault A	- Isc maximum at U - only protected polarity concerned - all the poles of the protected polarity must have a breaking capacity ≥ Isc max. at U	- Isc maximum at U/2 - only positive polarity concerned - all the positive polarity poles must have a breaking capacity ≥ Isc max. at U/2	- not relevant - the fault must be indicated by a permanent insulation monitor (PIM) and cleared (IEC/EN 60364)
Fault B	- Isc maximum at U - if one polarity (in this case positive) is protected: all the poles of this polarity must have a breaking capacity ≥ Isc max. at U - if two polarities are protected, to ensure isolation: all the protections of the two polarities must have a breaking capacity ≥ Isc max. at U	- Isc maximum at U - the 2 polarities are concerned - all the poles of the two polarities must have a breaking capacity ≥ Isc max. at U	- Isc maximum at U - the 2 polarities are concerned - all the poles of the two polarities must have a breaking capacity ≥ Isc max. at U
Fault C		- as for fault A - all the negative polarity poles must have a breaking capacity ≥ Isc max. at U/2	as for fault A with the same requirements

Applications

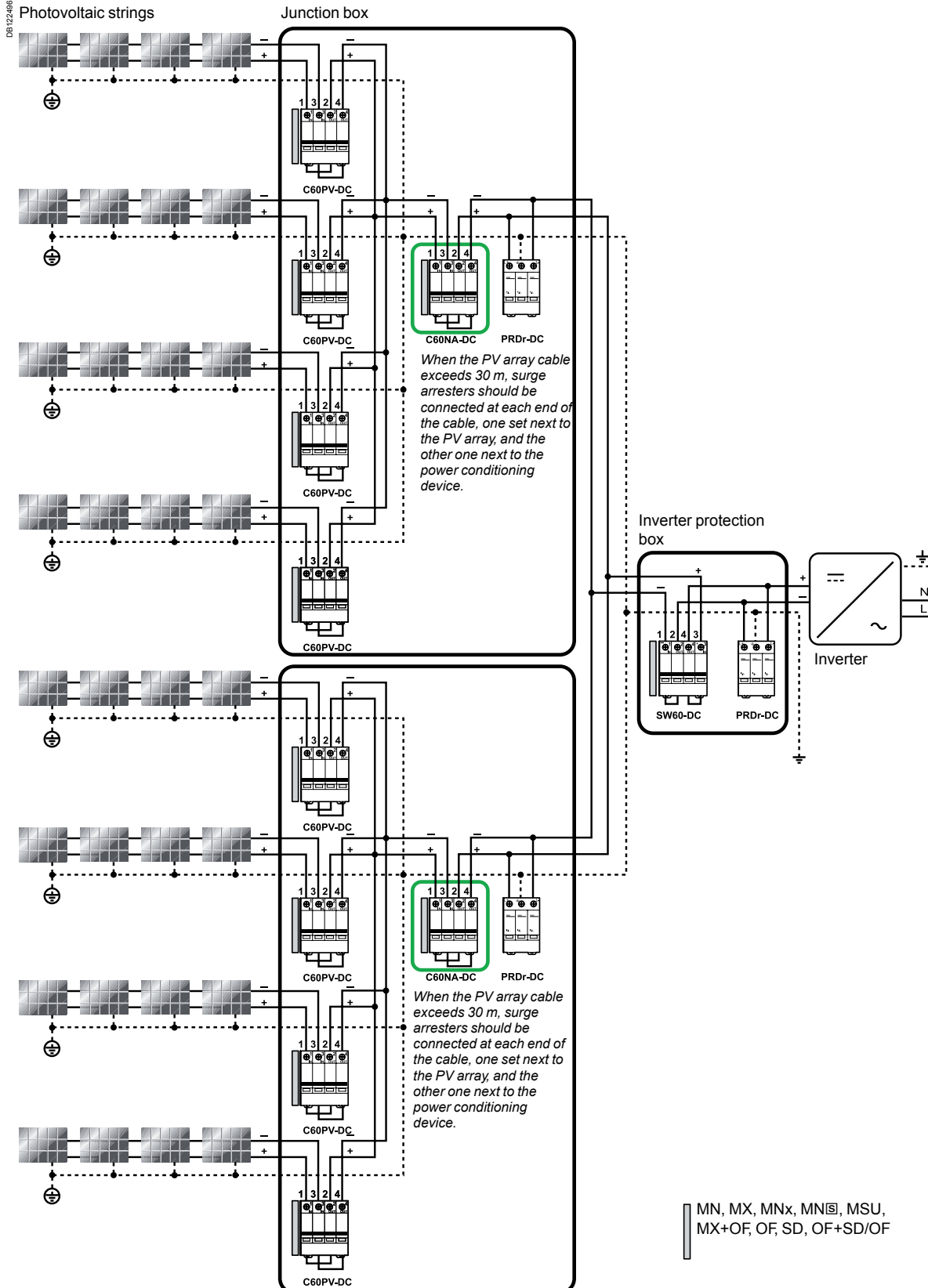


Diagram illustrating the connection of surge protection components for a PV system with two inverters.

Photovoltaic strings are connected to the system.

Surge Protection Components:

- C60PV-DC** (DC Surge Protection Device): Connected to the positive and negative lines of the PV strings.
- C60NA-DC** (DC Surge Protection Device): Connected to the positive and negative lines of the PV strings.
- PRDr-DC** (DC Surge Protection Device): Connected to the positive and negative lines of the PV strings.
- SW60-DC** (DC Surge Protection Device): Connected to the positive and negative lines of the PV strings.

Inverter Protection Box:

- Contains **SW60-DC** and **PRDr-DC** components.
- Connected to the positive and negative lines of the PV strings.

Inverter:

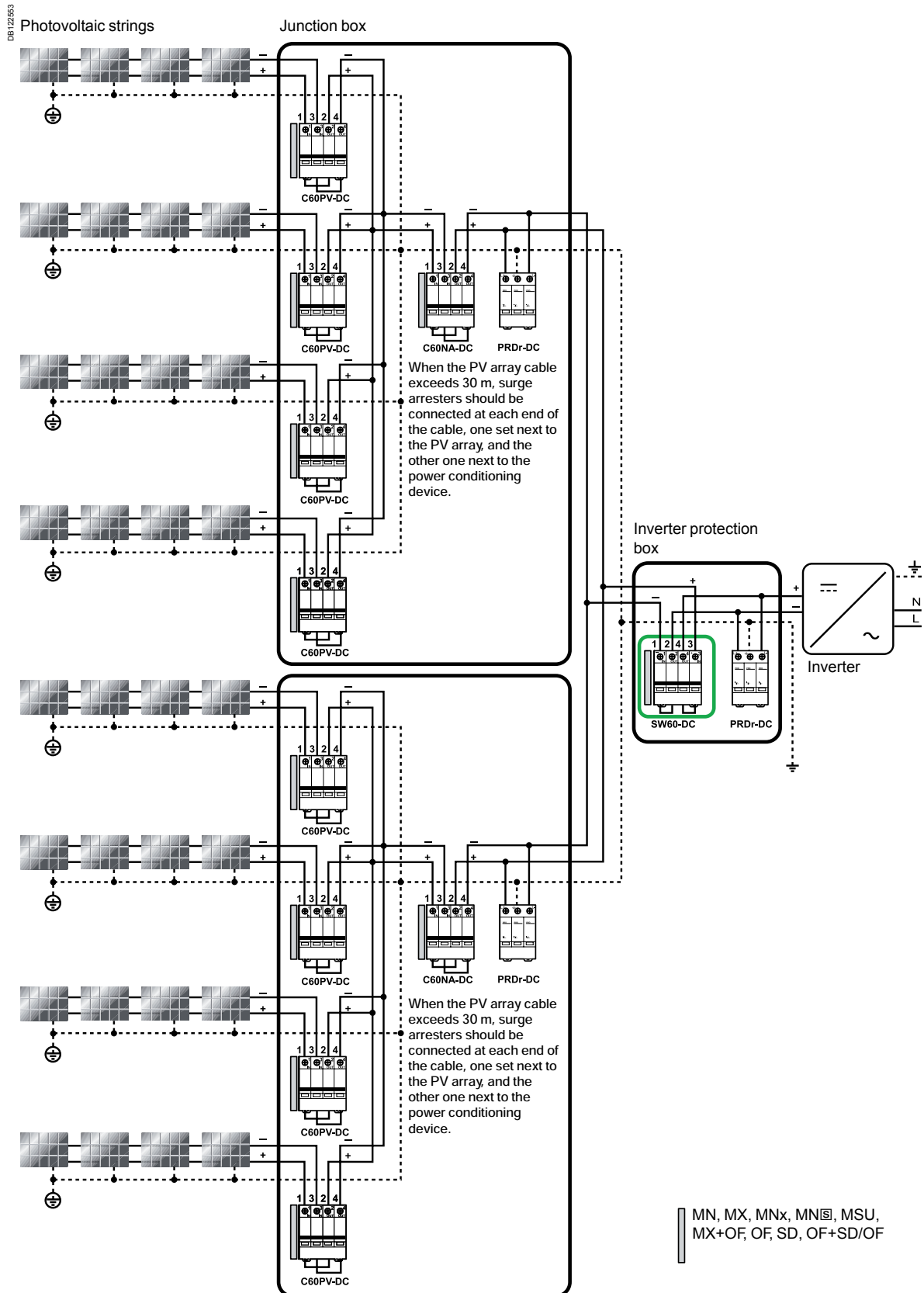
- Connected to the positive and negative lines of the PV strings.
- Output lines are labeled **N** (Neutral) and **L** (Line).

Notes:

- When the PV array cable exceeds 30 m, surge arresters should be connected at each end of the cable, one set next to the PV array, and the other one next to the power conditioning device.

Legend:

- MN, MX, MNx, MN $\square$, MSU, MX+OF, OF, SD, OF+SD/OF



Impulse relays are used to control circuits composed of resistive loads (incandescent lamps, low voltage halogen lamps, convectors) or inductive loads (fluorescent tubes, discharge lamps):

■ *the table opposite gives the power or maximum number of lamps which can be installed on a 230 V single-phase circuit*

■ *for 230/400 V three-phase + neutral circuits, multiply these values by 3 for 230 V three-phase circuits without neutral, multiply these values by 1.7.*

Lighting

Maximum number of lamps on a 230 V single-phase circuit						Max. power TL 16 A TL 32 A
Incandescent lamps						
Tungsten filaments (230 V)						
Power	40 W	60 W	75 W	100 W	200 W	
Maximum no.	40	25	20	16	8	1600 W
Maximum no.	65	43	34	26	13	2600 W
Halogen lamps (230 V)						
Power	300 W	500 W	1000 W	1500 W		
Maximum no.	5	3	1	1		1500 W
Maximum no.	8	5	2	1		2500 W
ELV halogen lamps (12 or 24 V with transfo)						
Power	20 W	50 W	75 W	100 W		
Maximum no.	70	28	19	14		1400 W
Maximum no.	110	44	29	22		2200 W
Fluorescent tubes						
Single with starter (not corrected) p.f. = 0.6						
Power	18 W	36 W	58 W			
Maximum no.		70	35	21		1300 W
Maximum no.		186	93	55		3400 W
Single with starter (parallel corrected) p.f. = 0.86						
Power	18 W	36 W	58 W			
Maximum no.		50	25	16		1100 W
Maximum no.		133	66	42		2400 W
Double with starter (series corrected) p.f. = 0.86						
Power	2x18 W	2x36 W	2x58 W			
Maximum no.		56	28	17		2000 W
Maximum no.		148	74	45		5300 W
HF single tubes and ballast p.f. = 0.96						
Power	16 W	32 W	50 W			
Maximum no.		80	40	26		1300 W
Maximum no.		212	106	69		3400 W
HF double tubes and ballast p.f. = 0.96						
Power	2x16 W	2x32 W	2x50 W			
Maximum no.		40	20	13		1300 W
Maximum no.		106	53	34		3400 W
Compact with electronic ballast without correction (incorporation)						
Power	7 W	10 W	18 W	26 W		
Maximum no.		50	45	35	30	800 W
Maximum no.		120	110	90	70	1800 W
Compact with integrated electronic ballast (substitution)						
Power	11 W	15 W	20 W	23 W		
Maximum no.		80	60	50	45	1100 W
Maximum no.		180	150	120	100	2400 W
Discharge lamps						
Low pressure sodium vapour p.f. = 0.96						
Power	55 W	90 W	135 W	180 W		
Maximum no.		24	15	10	7	1300 W
Maximum no.		63	40	26	18	3400 W
High pressure sodium vapour or metallic iodides p.f. = 0.96						
Power	250 W	400 W	1000 W			
Maximum no.		5	3	1		1300 W
Maximum no.		13	8	3		3400 W

Heating

230 V single-phase circuit		
Heating (AC1)	3600 W	7200 W

use of multi 9 contactors from 16 to 100 A

For automation needs in the housing, tertiary and industrial sectors, the range of modular CT contactors is used for:

- power control of final circuits for housing and the tertiary sector
- lighting (luminescent signs, shop windows, safety lighting, etc.)
- heating, heat pumps, ovens
- hot water for domestic use

- small utility motors (pumps, fans, barriers, garage doors, etc.)
- emergency stops and safety systems
- air conditioning
- energy distribution control:
 - load shedding and restoration
 - source changeover, etc.

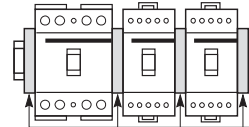
characterisation on load types

Standard IEC 61095 applies to electromechanical contactors for domestic and similar purposes. It differs from standard IEC 60947.4 (designed for industrial applications) by specific requirements relating to safety of persons and equipment in premises and corridors accessible to the general public.

applications	industrial: IEC 60947.4	domestic IEC61095
motor	AC3	AC7b
heating	AC1	AC7a
lighting	AC5a and b	AC5a and b

use for temperature between 50 and 60 °C

When contactors are mounted in enclosures with an internal temperature of between 50 and 60°C, a spacer, catalogue number 27062, must be placed between each contactor.



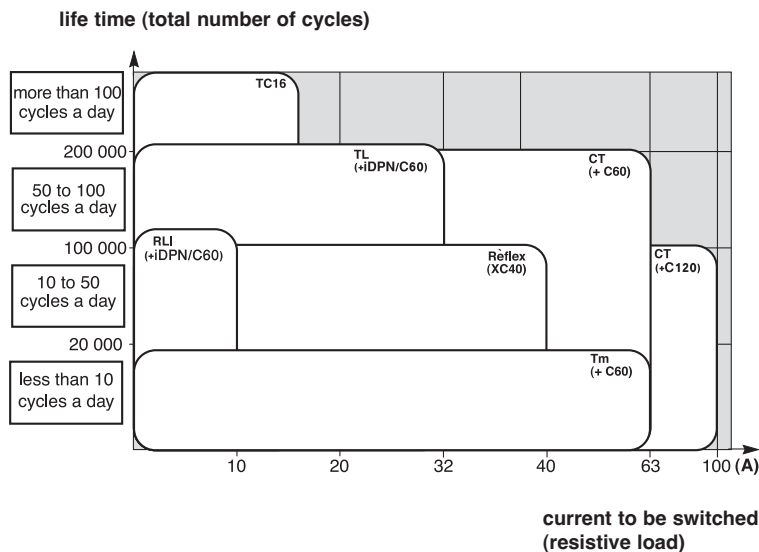
spacer
catalogue number
27062

positioning the remote control contactors

This table positions each device according to:

- the number of cycles (total or daily)
- the power to be controlled

It provides information on the protection circuit-breaker to be associated.



Complementary Technical Information Control command

CT contactors

lighting application

■ the following tables concern all the contactors from the CT range, with or without manual control, for 230 V single-phase lighting circuits

■ they indicate the contactor rating to be chosen according to the number and type of lamps to be controlled. As a guideline, maximum power is also given.

■ to obtain an equivalence on:

□ three-phase + neutral circuits: multiply the number of lamps and the power indicated in the table by 3.

□ three-phase without neutral circuits: multiply the number of lamps and the power indicated in the table by 1.7.

type of lighting application 230 V single-phase circuit	maximum number of lamps for a given rating CT contactors				
power (W)	16 A	25 A	40 A	63 A	100 A

incandescent lamp with or without halogen gas

40	38	57	115	172	250
60	30	45	85	125	187
75	25	38	70	100	150
100	19	28	50	73	110
150	12	18	35	50	75
200	10	14	26	37	55
300	7	10	18	25	37
500	4	6	10	15	22
1000	2	3	6	8	12

12 V halogen lamp (on ELV electromagnetic transformer)

20	15	23	42	63	94
50	10	15	27	42	63
75	8	12	23	35	52
100	6	9	18	27	40
150	4	6	13	19	28

26 mm fluorescent tube (single parallel-corrected)

15	15	20	40	60	90
18	15	20	40	60	90
20	15	20	40	60	90
36	15	20	40	60	90
40	15	20	40	60	90
58	10	15	30	43	64
65	10	15	30	43	64
115	5	7	14	20	30
140	5	7	14	20	30

26 mm fluorescent tube (single uncorrected)

15	22	30	70	100	150
18	22	30	70	100	150
20	22	30	70	100	150
36	20	28	60	90	135
40	20	28	60	90	135
58	13	17	35	56	84
65	13	17	35	56	84
115	7	10	20	32	48
140	7	10	20	32	48

26 mm fluorescent tube (dual serial-corrected)

2 x 18	30	46	80	123	180
2 x 20	30	46	80	123	180
2 x 36	17	25	43	67	100
2 x 40	17	25	43	67	100
2 x 58	10	16	27	42	63
2 x 65	10	16	27	42	63
2 x 118	6	10	16	25	37
2 x 140	6	10	16	25	37

type of lighting application 230 V single-phase circuit	maximum number of lamps for a given rating CT contactors				
power (W)	16 A	25 A	40 A	63 A	100 A

26 mm fluorescent tube (4 tubes, serial correction)

4 x 18	15	23	46	69	100
--------	----	----	----	----	-----

electronic ballast (1 x 26 mm tube)

18	74	111	222	333	500
36	38	58	117	176	260
58	25	37	74	111	160

electronic ballast (2 x 26 mm tubes)

2 x 18	36	55	111	166	250
2 x 36	20	30	60	90	135
2 x 58	12	19	38	57	85

electronic compact lamp (low consumption)

7	133	200	400	600	900
11	80	120	240	360	540
15	58	88	176	264	396
20	44	66	132	200	300
23	38	57	114	171	256

low pressure sodium vapour lamp (without correction)

18	18	34	57	91
35	4	9	14	24
55	5	9	14	24
90	3	6	9	19
135	2	4	6	10
180	2	4	6	10

low pressure sodium vapour lamp (with parallel correction)

18	14	21	40	60
35	3	5	10	15
55	3	5	10	15
90	2	4	8	11
135	1	2	4	6
180	1	2	5	7

high pressure sodium vapour lamp (with correction)

70	8	12	20	32
150	4	7	13	18
250	2	4	8	11
400	1	3	5	8
1000	-	1	2	3

high pressure sodium vapour lamp (with parallel correction)

70	6	9	18	25
150	6	9	18	25
250	2	3	6	9
400	2	4	8	12
1000	1	2	4	6

heating application

■ the following table concerns all the contactors in the CT range, with or without manual control, for 230 V single-phase and 400 V three-phase heating circuits.

■ it indicates the contactor rating to be chosen according to the power to be controlled and the number of operations a day.

type of heating application	maximum power (kW) for a given rating			
number of operations / day	CT contactors			
	25 A	40 A	63 A	100 A

230 V heating

25	5.4	8.6	14	21.6
50	5.4	8.6	14	21.6
75	4.6	7.4	12	18
100	4	6	9.5	14
250	2.5	3.8	6	9
500	1.7	2.7	4.5	6.8

400 V heating

25	16	26	41	63
50	16	26	41	63
75	14	22	35	52
100	11	17	26	40
250	5	8	13	19
500	3.5	6	9	14

small motor application

■ the following table concerns all the contactors in the CT range, with or without manual control, for 230 V single-phase and 400 V three-phase circuits.

■ it indicates the contactor rating to be chosen according to the power of the motor to be controlled.

small motor application type	maximum power (kW) for a given rating		
	CT contactors		
voltage	25 A	40 A	63 A

asynchronous single-phase motor with capacitor

230 V	1.4	2.5	4
-------	-----	-----	---

asynchronous three-phase motor

400 V	4	7.5	15
-------	---	-----	----

universal motor

230 V	0.9	1.4	2.2
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additional information

auxiliaries: page D40 to D42
dimensions: page D86

05359



MIN

P93363



MINs

P93364



MINp

P93365



MINt

■ MIN load table:

Type of lighting	Max. power
230 V incandescent and halogen lamps	2300 W
Non-corrected/ serial-corrected/ dual mounted fluorescent tubes with conventional ballast	2300 VA
Fluocompact lamps with conventional ballast	2000 VA
Parallel-corrected fluorescent tubes with conventional ballast	1300 VA (70 °F)
Fluorescent tubes with electronic ballast	300 VA
Fluocompact lamps with electronic ballast	9 x 7 W, 6 x 11 W, 5 x 15 W, 5 x 20 W

■ MINs load table:

Type of lighting	Max. power
230 V incandescent and halogen lamps	2300 W
Non-corrected/ serial-corrected/ dual mounted fluorescent tubes with conventional ballast	2300 VA
Fluocompact lamps with conventional ballast	1500 VA
Parallel-corrected fluorescent tubes with conventional ballast	400 VA (42 °F)
Fluorescent tubes with electronic ballast	300 VA
Fluocompact lamps with electronic ballast	9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W, 7 x 23 W

■ MINp, MINt load table:

Type of lighting	Max. power
230 V incandescent and halogen lamps	3600 W
Non-corrected/ serial-corrected/ dual mounted fluorescent tubes with conventional ballast	3600 VA (1)
Fluocompact lamps with conventional ballast	1500 VA (1)
Parallel-corrected fluorescent tubes with conventional ballast	200 VA (120 °F) (1)
Fluorescent tubes with electronic ballast	1000 VA
Fluocompact lamps with electronic ballast	34 x 7 W, 27 x 11 W, 24 x 15 W, 22 x 23 W

(1) The "switch-off warning" function is not available for these types of loads.

Programming principle

Practicle advices

- For the IHP switches, this consists of memorising the days and times of the required switching operations.
- For the IH - IHH switches, this is performed by positioning captive segments or jumpers on a switching dial.

Example

- Controlling an air conditioner in a hairdressing salon:

	Monday ⁽¹⁾	Tuesday	Wednesday	Thursday ⁽²⁾	etc.	
On n° 1		08 h 30	08 h 30	08 h 30		switch on
Off n° 1		12 h 00	12 h 00			switch off
On n° 2		13 h 30	13 h 30			switch on
Off n° 2		20 h 00	20 h 00	20 h 00		switch off

(1) Closed on Mondays

(2) Non-stop

Programming by copying or blocks

Whenever identical switching operations are found at the same times, several days in the week, this function lets you program these operations once only. In this case a single switching operation is used. If this function is used wisely, the number of possible switching operations can be greatly increased.

Example

	Monday	Tuesday	Wednesday	Thursday	Friday	
On n°1	10 h 00			10 h 00		switch on
Off n°1		18 h 00	18 h 00		18 h 00	switch off

1 switching operation 1 switching operation

Number of switching operations

Designation	Number of switching operations
IHP 1c	56
IHP + 1c	84
IHP DCF 1c	42
IHP 2c	56
IHP + 2c	84
IHP 18 mm 1c	28
IHP + 1c 18 mm	42
ITM 4C-6E	45 time brackets in weekly time programming, 15 time brackets in annual time programming and 20 different pulses in pulse programming
IHP 1c (UL)	28
IH 7d 1c ARM	42 On / 42 Off
IH 24h 1c ARM	48 On - 48 Off
IH 24h 1c SRM	48 On - 48 Off
IH 60mn 1c SRM	24 On - 24 Off
IH 24h 1c SRM	24 On - 24 Off
IH 24h 1c ARM	24 On - 24 Off
IH 24h 2c ARM	24 On - 24 Off
IH 7j 1c ARM	21 On - 21 Off
IH 24 h + 7j 1+1c ARM	16 On - 16 Off + 7 On - 7 Off

Saving on mains cut off

For IHP switches equipped with this function, a lithium battery is used for saving. The program, date and time are preserved. Switching operations are not performed.

60 min. time programming.

Lets you control starting and stopping of a group of loads according to a cycle that is repeated every 60 minutes.

Example

■ Controlling automatic watering:

On n° 1	2 min. 30 s
Off n° 1	5 min.
On n° 2	25 min.
Off n° 2	37 min. 30 s

Relevant time switches

■ IH 60mn 1c SRM

24 h daily programming.

Lets you control starting and stopping of one or two groups of loads according to a daily cycle that is repeated, in identical manner, every day of the week.

Example

■ Controlling a door of a block of flats:

- from 8 am to 7.30 pm: contact on "On", free access
- from 7.30 pm to 8 am the next day: contact on "Off", access by confidential code every day of the week:

	From Monday to Sunday
On n° 1	8 am
Off n° 1	7.30 pm

Relevant time switches

- IH 24h 1c SRM/ARM
- IH 24h 2c ARM
- IHP 1c 18 mm
- IHP + 1c 18 mm
- IHP DCF 1c
- IHP 1c, IHP + 1c
- IHP 2c, IHP + 2c
- ITM 4C-6E

Example

■ Controlling the lighting of a shop window:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
On n° 1		09 h 00	09 h 00	09 h 00		
Off n° 1		12 h 00	12 h 00			
On n° 2		14 h 00	14 h 00			
Off n° 2		20 h 00	20 h 00	20 h 00		
On n° 3					8 h 30	8 h 30
Off n° 3					12 h 30	12 h 30
On n° 4					14 h 30	14 h 30
Off n° 4					21 h 00	21 h 00

Relevant time switches

- IH 7j 1c ARM
- IHP 1c, IHP + 1c
- IHP 2c, IHP + 2c
- IHP 1c 18 mm
- IHP + 1c 18 mm
- IHP DCF 1c
- ITM 4C-6E

7 days weekly programming.

Lets you control starting and stopping of one to 4 groups of loads according to a weekly cycle, that can be different each day, repeated each week.

Pulse programming.

Lets you control by pulses (adjustable from 1 to 59 s) one to four groups of loads (pulse relays, bells, etc.).

Example

■ Automatic controlling of bells, lighting and distribution of food: bells sounding the resumption and finish of work (channel 1), lighting of premises (channel 2), feeding fish in the aquarium (channel 3):

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Channel 1: bell (20 s pulse order)							
On	08 h 00	08 h 00	08 h 00	08 h 00	07 h 00	09 h 00	
Duration	20 s	20 s	20 s	20 s	20 s	20 s	
On	12 h 00	12 h 00	12 h 00	12 h 00	11 h 00	13 h 00	
Duration	20 s	20 s	20 s	20 s	20 s	20 s	
On	14 h 00	14 h 00	14 h 00	14 h 00	13 h 00		
Duration	20 s	20 s	20 s	20 s	20 s		
On	18 h 00	18 h 00	18 h 00	18 h 00	16 h 00		
Duration	20 s	20 s	20 s	20 s	20 s		
Channel 2: lighting (latched order)							
On	07 h 30	07 h 30	07 h 30	07 h 30	06 h 30	08 h 30	
Off	18 h 30	18 h 30	18 h 30	18 h 30	17 h 00	13 h 30	
Channel 3: aquarium (15 s pulse order)							
On	10 h 00		10 h 00		10 h 00		10 h 00
Duration	15 s		15 s		15 s		15 s

Programming

- Programming of a pulse takes up 2 memory spaces.
- Combination of the two order types (pulse and latched) is possible on the same channel.

Relevant time switches

- IHP + 1c
- IHP + 1c 18 mm
- IHP DCF 1c
- IHP + 2c
- ITM 4C-6E

Example

- Controlling lighting and heating in a school:
 - basic programming: program lighting (channel 1) and heating (channel 2):

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Channel 1: lighting							
On	07 h 00	07 h 00	07 h 00	07 h 00	07 h 00		
Off	20 h 00	20 h 00	16 h 00	20 h 00	16 h 00		
Channel 2: heating							
On	06 h 00	06 h 00	06 h 00	06 h 00	06 h 00		
Off	18 h 00	18 h 00	12 h 00	18 h 00	12 h 00		

- dated programming: periods of non-operation, school holidays, etc.
Just memorise an Off at the start and another Off at the end of each period of absence:

		Holidays				
		Winter	Spring	Summer	Autumn	End of year
Channel 1: lighting						
Off	Date	20 feb.	17-apr	07-july	23 oct.	18 dec.
	Time	12 h 00	17 h 00	12 h 00	17 h 00	12 h 00
Off	Date	08-march	03-may	9 sept.	2 nov.	4 jan.
	Time	01 h 00	01 h 00	01 h 00	01 h 00	01 h 00
Channel 2: heating						
Off	Date	20 feb.	17-apr		23 oct.	18 dec.
	Time	12 h 00	17 h 00		17 h 00	12 h 00
Off	Date	08-march	03-may		2 nov.	4 jan.
	Time	01 h 00	01 h 00		01 h 00	01 h 00

Relevant time switches

- ITM 4C-6E.

Programming special days.

Lets you create special programs for dated days.

P83235-42



IC100

P83237-38



Wall-mounted cell

P93367



IC2000

P93365



Wall-mounted cell

P83236-40



IC2000P+

P8100207-40



IC Astro

■ IC100 load table

Type of lighting	Max. power (for higher power, relay with a CT contactor)
230 V incandescent and halogen lamps	2300 W
Non-corrected/ serial-corrected/ dual mounted fluorescent tubes with conventional ballast	2300 VA
Fluocompact lamps with conventional ballast	1500 VA
Non-corrected/ serial-corrected mercury and sodium vapour lamps	1000 VA
Parallel-corrected mercury/ sodium vapour lamps and parallel-corrected fluorescent tubes with conventional ballast	400 VA
Fluorescent tubes/ dual mounted with electronic ballast	300 VA
Fluocompact lamps with electronic ballast	9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W, 7 x 23 W

■ IC2000 load table

Type of lighting	Max. power (for higher power, relay with a CT contactor)
230 V incandescent and halogen lamps	2300 W
Non-corrected/ serial-corrected/ dual mounted fluorescent tubes with conventional ballast	2300 VA
Fluocompact lamps with conventional ballast	1500 VA
Non-corrected/ serial-corrected mercury and sodium vapour lamps	1000 VA
Parallel-corrected mercury/ sodium vapour lamps and parallel-corrected fluorescent tubes with conventional ballast	400 VA
Fluorescent / dual-mounted fluorescent tubes with electronic ballast	300 VA
Fluocompact lamps with electronic ballast	9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W, 7 x 23 W

■ IC2000P+ load table

Type of lighting	Max. power (for higher power, relay with a CT contactor)
230 V incandescent and halogen lamps	2300 W
Non corrected/serial corrected fluorescent tubes with conventional ballast	26 x 36 W, 20 x 58 W, 10 x 100 W
Parallel corrected fluorescent tubes with conventional ballast	10 x 36 W, 6 x 58 W, 2 x 100 W
Dual-mounted fluorescent tubes with conventional ballast	10 x (2 x 58 W), 5 x (2 x 100 W)
Fluorescent tubes with electronic ballast	9 x 36 W, 6 x 58 W
Dual-mounted fluorescent tubes with electronic ballast	5 x (2 x 36 W), 3 x (2 x 58 W)
Fluocompact lamps with electronic ballast	9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W
Parallel-corrected mercury and sodium vapour lamps	250 W

Type	Cat. no.
IC 2000P+	15483

■ IC Astro

Type of lighting	Max. power (For higher power, relay with a CT contactor)
230 V incandescent and halogen lamps	2300 W
Non-corrected/ serial-corrected fluorescent tubes with conventional ballast	26 x 36 W, 20 x 58 W, 10 x 100 W
Parallel corrected fluorescent tubes with conventional ballast	10 x 36 W, 6 x 58 W, 2 x 100 W
Dual-mounted fluorescent tubes with conventional ballast	10 x (2 x 58 W), 5 x (2 x 100 W)
Fluorescent tubes with electronic ballast	9 x 36 W, 6 x 58 W
Dual-mounted fluorescent tubes with electronic ballast	5 x (2 x 36 W), 3 x (2 x 58 W)
Fluocompact lamps with electronic ballast	9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W
Parallel-corrected mercury and sodium vapour lamps	250 W

Light sensitive switches Practical example IC2000P+

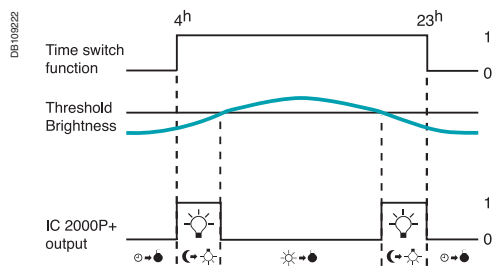


Fig. 1

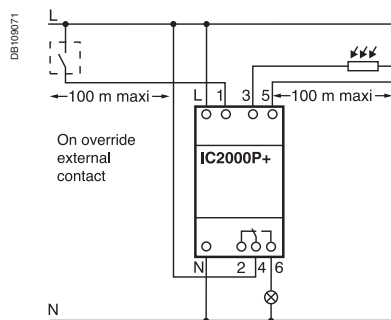


Fig. 2

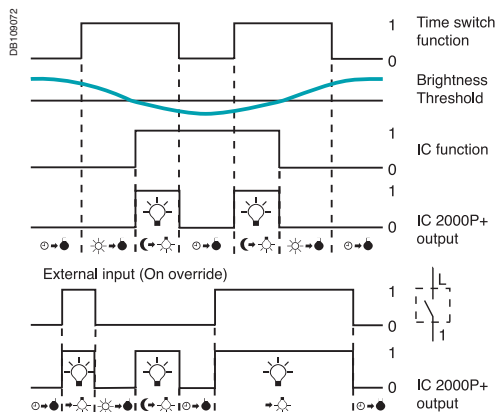


Fig. 3

Application example (Fig. 1)

Lighting of a shop window, in the evening, at a time variable according to brightness and switch-off at a set time (e.g. 11 pm). Then in the morning, lighting at a set time (e.g. 4 am) and switch-off at a time variable according to brightness.

Configuration

This consists of recording in the memory:

- The language
- The year, month, day and time
- One of the 3 pre-set programs:
 - "DAYPROG": "On" time programming from 7 am to 8 pm a validation of the IC function from 7 am to 8 pm,
 - "NIGHTPROG": "On" time programming from 5 am to 8 am and from 6 pm to 11 pm ⇒ validation of the IC function on these two operating periods,
 - "EMPTYPROG": "Off" time programming throughout the day a no validation of the IC function. These programs can be modified.
- The brightness threshold. Once this phase is over, your IC2000P+ operates in AUTO mode according to the items you have chosen.

Programming

The IC2000P+ is used to manage time programs. It allows:

- Creation of a new program with the possibility of copying to the other days,
- Viewing programs in memory,
- Modification of a program in memory, of the time, date, summer/winter time,
- Partial or total deletion of the program (date, time and language are kept),
- Modification of the brightness threshold,
- Separate setting of the time delay on switch-on and switch-off.

Move to On/Off override (Fig. 3)

- Press briefly (< 2 s) and simultaneously the 2 keys "-", "+" (value setting and navigation keys) on the front face to move to "MAN ON" or "MAN OFF".
- Press the keys for more than 2 s to move to "PERM ON" or "PERM OFF".
- Supply of terminal 1 overrides the IC2000P+ output to the "On" position. This external override takes priority over the product On/Off override function.

Light sensitive switches

Practical example

IC Astro

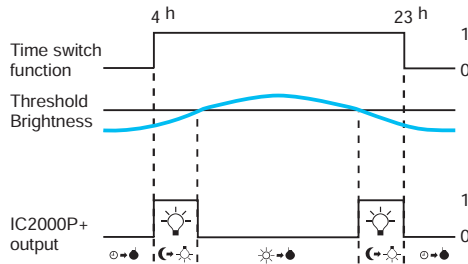


Fig. 1.

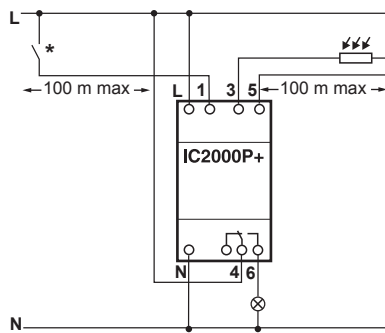


Fig. 2.

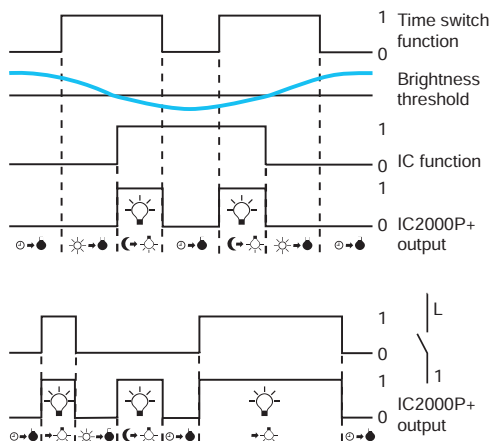


Fig. 3.

Practicle advices

Application example (Fig. 1)

Lighting of a shop window, in the evening, at a time variable according to brightness and switch-off at a set time (e.g. 11 pm). Then in the morning, lighting at a set time (e.g. 4 am) and switch-off at a time variable according to brightness.

Configuration

This consists of recording in the memory:

- the language
- the year, month, day and time
- one of the 3 pre-set programs:
 - "DAYPROG": "On" time programming from 7 am to 8 pm ⇒ validation of the IC function from 7 am to 8 pm,
 - "NIGHTPROG": "On" time programming from 5 am to 8 am and from 6 pm to 11 pm ⇒ validation of the IC function on these two operating periods,
 - "EMPTYPROG": "Off" time programming throughout the day ⇒ no validation of the IC function. These programs can be modified.
- the brightness threshold. Once this phase is over, your IC 2000P+ operates in AUTO mode according to the items you have chosen.

Programming

The IC2000P+ is used to manage time programs. It allows:

- creation of a new program with the possibility of copying to the other days
- viewing programs in memory
- modification of a program in memory, of the time, date, summer/winter time
- partial or total deletion of the program (date, time and language are kept)
- modification of the brightness threshold
- separate setting of the time delay on switch-on and switch-off.

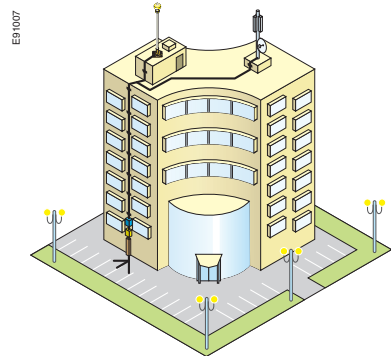
Move to On/Off override (Fig. 3)

- Press briefly (< 2 s) and simultaneously the 2 keys "-", "+" (value setting and navigation keys) on the front face to move to "MAN ON" or "MAN OFF".
- Press the keys for more than 2 s to move to "PERM ON" or "PERM OFF".
- Supply of terminal 1 overrides the IC 2000P+ output to the "On" position. This external override takes priority over the product On/Off override function.

Surge arresters selection

Choosing surge arresters for: LV networks

In function of the site's characteristics



Choosing surge arresters: 2 examples of use

- installing surge arresters in a structure equipped with a lightning conductor
- installing surge arresters in a structure not equipped with a lightning conductor.

Installation with lightning conductor

The presence of a lightning conductor on the building or in a 50 m radius can cause a direct lightning stroke generating a rise in the frame potential and that of the earthing system. Part of the lightning current rises in the electrical installation through the rod then the earth bar.

- in order to protect the loads, a high flow capacity Type 1 PRF1 surge arrester (class 1 test) must then be installed at the incomer end of the switchboard that is capable of arcing and then conducting the lightning current towards a distant earth referenced at 0 V.

- Two technologies are available:

□ air gap technology: this is the PRF1 range requiring systematic installation of another surge arrester (type 2) in cascade, so that the residual voltage at the terminals of the second surge arrester $I_{\max} = 40 \text{ kA}$ (PRD40, PF40) is compatible with the impulse withstand voltage of the equipment to be protected ($U_{\text{impulse}} < 1.5 \text{ kV}$)

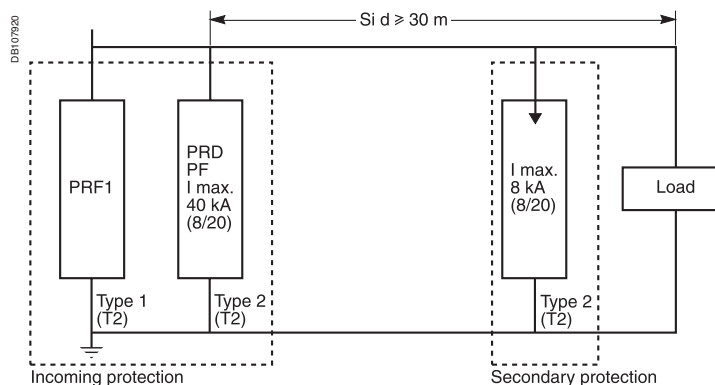
□ technology with varistor: this is the PRD1 draw-out surge arrester range.

Installation of another surge arrester (type 2) is not required.

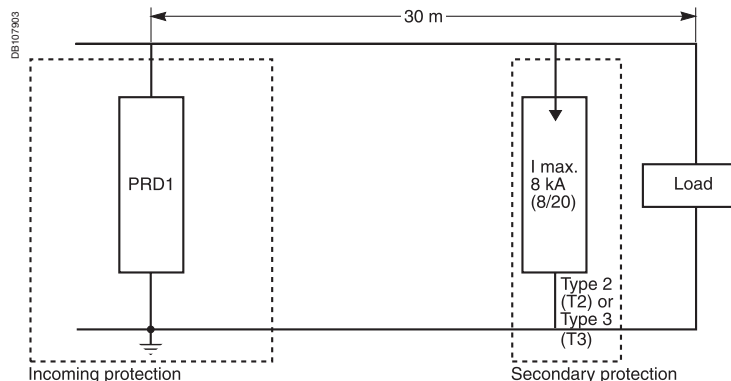
- if the loads to be protected are located more than 30 m away from the incoming protection, a secondary protection surge arrester $I_{\max} 8 \text{ kA}$ (PRD8, PF8) will be installed as close as possible to the loads

- Type 1 (class 1 test) or type 2 (class 2 test) surge arresters meet the standard EN 61-643-11 (IEC 61643-11).

Type 1 protection with PRF1



Type 1 protection with PRD1



In function of the site's characteristics

ES1006



Installation without lightning conductor

- the following table determines the maximum current of the surge arrester(s) to be installed according to geographic situation and lightning stroke density of the site to be protected.
- mount a secondary protection surge arrester I_{max} : 8 kA if:
 - the distance between the incoming surge arrester and loads is ≥ 30 m
 - the surge arrester's voltage U_p is too high in regards to the sensitivity of the load to be protected (U_{choc}) (see F68).

Residential

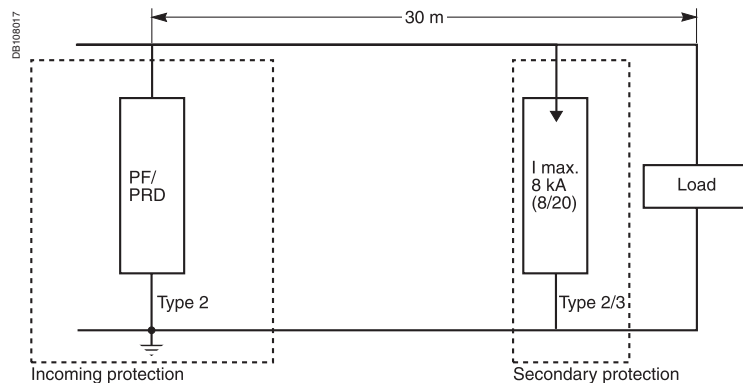
Geographical location	Urban			Rural		
Lightning flash density (N_g)	≤ 0.5	$0.5 < N_g < 1.6$	≥ 1.6	≤ 0.5	$0.5 < N_g < 1.6$	≥ 1.6
I_{max} (kA) incoming protection	10-20	10-20	10-20	10-20	40	65
I_{max} (kA) secondary protection if: U_p too high and/or $d \geq 30$ m					8	8

Tertiary/industrial⁽¹⁾

Continuity of supply of the operation	Not necessary			Partial			Mandatory		
Consequence (financial) of a lightning stroke on equipment to be protected	Low			High			Very high		
Lightning flash density (N_g)	≤ 0.5	$0.5 < N_g < 1.6$	≥ 1.6	≤ 0.5	$0.5 < N_g < 1.6$	≥ 1.6	≤ 0.5	$0.5 < N_g < 1.6$	≥ 1.6
I_{max} (kA) incoming protection	20	20	40	20	40	65	40	65	65
I_{max} (kA) secondary protection if: U_p too high and/or $d \geq 30$ m			8		8	8	8	8	8

(1) Since in the tertiary/industrial sector the cost of equipment to be protected is higher, damage due to lightning is more significant

Type 1 protection with PF/PRD



Surge arresters selection

Choosing surge arresters for: LV networks (cont.)

In function of the technical data for loads

- the surge arrester's level of protection (U_p) depends on the installed equipment and the rated voltage of the installation
- U_p must lie between:
 - the full voltage of the permanent operating conditions (U_c)
 - the impulse withstand voltage (U_{choc}) of the equipment to be protected.

8/20 impulse withstand table for equipment to be protected

General standard: IEC 60364-4.

$U_c < U_p < U_{choc}$

Rated voltage of the	Equipment sensitivity withstand (U_{choc})			
Three phase networks	Reduced	Normal	High	Very high
	Electronic circuit devices: televisions, alarms, HiFi, Video recorders, computers telecommunication	Electrical household appliances: dishwashers, ovens refrigerators, portable tools	Industrial devices: motors, distribution cabinets, current sockets, transformers	Industrial devices: electric meters, telemeters
400/690/1000 V	2.5 kV	4 kV	6 kV	8 kV
230/440 V	1.5 kV Shock wave category I	2.5 kV Shock wave category II	4 kV Shock wave category III	6 kV Shock wave category IV

Permanent operating full withstand voltage U_c as in the IEC 60364-5-534 standard

Earthing systems	TT	TN-S	TN-C	IT
U_c value for common mode (protection between live conductors and earth)	$\geq 1.1 U_o$	$\geq 1.1 U_o$	$\geq 1.1 U_o$	$\geq 1.732 U_o$
U_c value for differential mode (protection between phase and neutral)	$\geq 1.1 U_o$	$\geq 1.1 U_o$		$\geq 1.1 U_o$

U_o : simple network voltage between phase and neutral

U_c : full voltage under permanent operating conditions.

U_p : voltage that characterises the protection performance of surge arrester at I_n

Note: Rated impulse withstand voltage is an impulse withstand voltage assigned by the manufacturer to the equipment or to a part of it, characterizing the specified capability of its insulation against overvoltages (in accordance with 1.3.9.2 of IEC 60664.1).

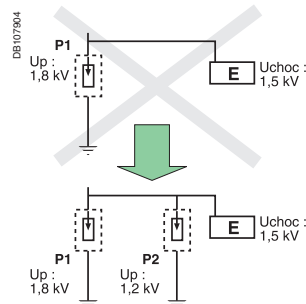
Placing several surge arresters in a cascading configuration

The incoming protection device (P1) is dimensioned to run-off lightning currents at the source of the installation, 2 cases are possible:

- if there is a level of protection (U_p) too high for the impulse withstand voltage (U_{choc}) of the installation's equipment (figure 1):
 - a secondary protection surge arrester (P2) placed near loads is sufficient, to lower the voltage and make it compatible with the impulse withstand voltage of the equipment to be protected (see installation constraints section).
- if sensitive equipments too far from the incoming protection device ($d \geq 30$ m figure 2):
 - a secondary protection surge arrester (P2) placed near loads suffices, to lower the voltage and make it compatible with the impulse withstand voltage of the equipment to be protected (see installation constraints section).

Up surge arrester < Uchoc switchgear

Example figure 1

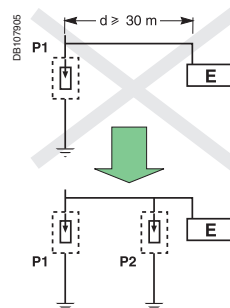


E: equipment to be protected (impulse withstand of 1.5 kV)

P1: incoming protection device dimensioned with I_n and I_{max} that are sufficient enough to face lightning currents that may appear and with a level of protection of 1.8 kV

P2: surge arrester near equipment to be protected with an adapted level of protection and which is co-ordinated with P1

Example figure 2



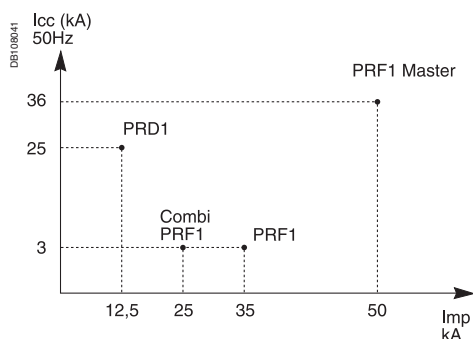
E: equipment to be protected (impulse withstand of 1.5 kV)

P1: incoming protection device dimensioned with I_n and I_{max} that are sufficient enough to face lightning currents that may appear and with a level of protection of 1.5 kV. This level of 1.5 kV is acceptable in principle, but the distance d is too great

P2: surge arrester near equipment to be protected with an adapted level of protection and which is co-ordinated with P1

Surge arresters selection

Choosing surge arresters for: LV networks (cont.)



Choice depending on the earthing system PRF1 and PRD1 offers Type 1 (class 1 test)

Type of surge arresters	TT	TN-S	TN-C	IT distributed neutral	IT non-distributed neutral
PRF1					
Uc = 260 V	1P+1N/PE 3 x 1P+1N/PE	1P+1N/PE 3 x 1P+1N/PE	1P 3x1P		
Uc = 400 V	1P+N 3P+N	1P+N 3P+N	1P 3P	1P+N 3P+N	1P 3P
Combi PRF1					
Uc = 260 V	1P+N 3P+N	1P+N 3P+N			
PRF1 Master					
Uc = 440 V	2 x 1P 4 x 1P	2 x 1P 4 x 1P	1P 3 x 1P	2 x 1P 4 x 1P	1P 3 x 1P
PRD1					
Uc = 340 V	2P ⁽¹⁾ 4P ⁽¹⁾	2P 4P	3P		

(1) Can be utilized only if differential mode upstream PRD1

Choice depending on the earthing system PRD, PF offers Type 2 (class 2 test)

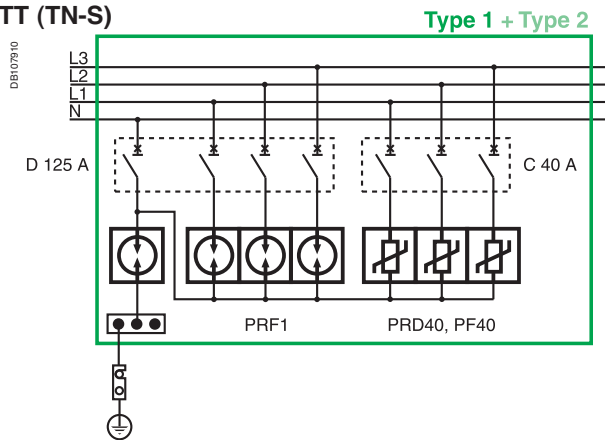
Type of surge arresters	TT	TN-S	TN-C	IT
PRD				
MC Uc = 340 V	1P	2P 4P	1P 2P 3P	
MC Uc = 440 V				3P 4P
MC/MD Uc = 440/340 V	1P+N 3P+N	1P+N 3P+N		
PF				
MC Uc = 340 V	1P	2P 4P	1P 2P 3P	
MC Uc = 440 V				
MC/MD Uc = 440/340 V	1P+N 3P+N	1P+N 3P+N		

PRF1 Type 1 surge arrester and Type 2 surge arrester combination tables

Reminder: use of the air gap technology makes the PRF1 and Type 2 surge arrester combination essential.

In the same switchboard

TT (TN-S)

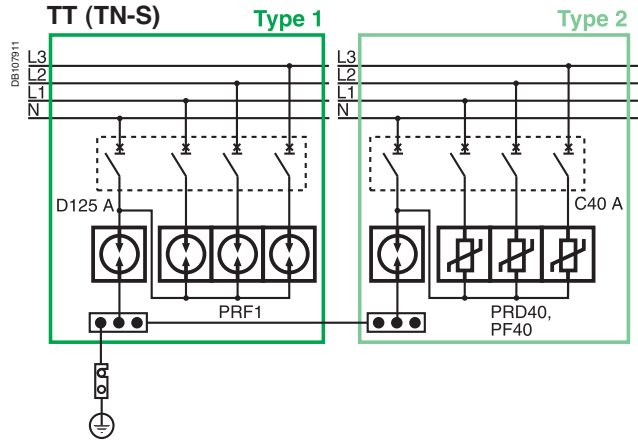


TT (TN-S)	Type 1	CB	+ Type 2 ⁽¹⁾	CB
Uc 1P+N 260 V	PRF1 1P 260 V + PRF1 50 N/PE (ref. 16621 + 16623)	D125 A 2P (ref. 18532)	PRD40r 1P 340 V (ref. 16561) PF40 1P (ref. 15686)	1P 40 A curve C
3P+N	3x PRF1 1P 260 V + PRF1 100 N/PE (3x ref. 16621 + 16624)	D125 A 4P (ref. 18534)	PRD40r 3P 340 V (ref. 16445) PF40 3P (ref. 15582)	3P 40 A curve C

(1) The Type 1 surge arrester N/PE module is common to Type 1 and Type 2.

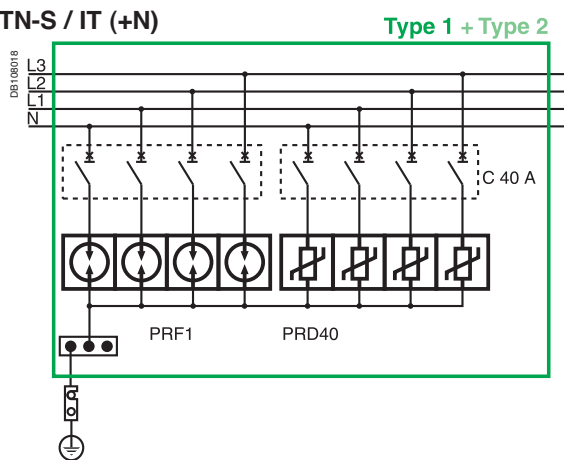
In two separate switchboards

TT (TN-S)



TT (TN-S)	Type 1	CB	+ Type 2	CB
Uc 1P+N 260 V	PRF1 1P 260 V + PRF1 50 N/PE (ref. 16621 + 16623)	D125 A 2P (ref. 18532)	PRD40r 1P+N (ref. 16562) PF40 1P+N (ref. 15687)	2P 40 A curve C
3P+N	3x PRF1 1P 260 V + PRF1 100 N/PE (3x ref. 16621 + 16624)	D125 A 4P (ref. 18534)	PRD40r 3P+N (ref. 16564) PF40 3P (ref. 15690)	4P 40 A curve C

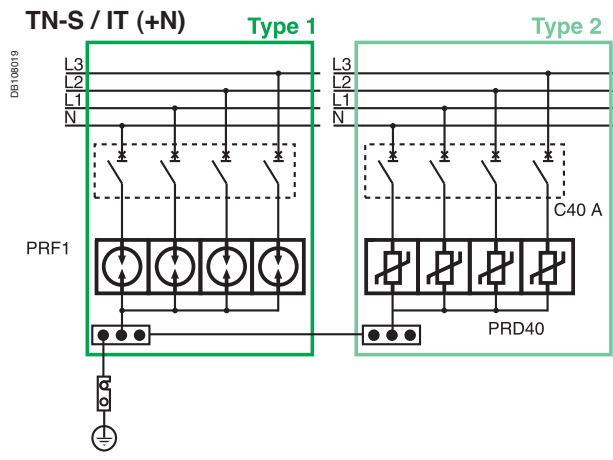
TN-S / IT (+N)



TN-S	Type 1	CB	+ Type 2	CB
Uc 1P+N 260 V	2x PRF1 1P 260 V (ref. 16621)	D125 A 2P (ref. 18532)	PRD40r 2P (ref. 16444)	2P 40 A curve C
3P+N	4x PRF1 1P 260 V (ref. 16621)	D125 A 4P (ref. 18534)	PRD40r 4P (ref. 16664)	4P 40 A curve C

TN-S/ IT (N)	Type 1	CB	+ Type 2	CB
Uc 1P+N 440 V	PRF1 1P+N 440 V (ref. 16625)	D125 A 2P (ref. 18532)	PRD40r 1P 440 V (ref. 16560)	1P 40 A curve C
3P+N	PRF1 3P+N 440 V (ref. 16628)	D125 A 4P (ref. 18534)	PRD40r 3P IT 460 V (ref. 16563)	3P 40 A curve C

TN-S / IT (+N)



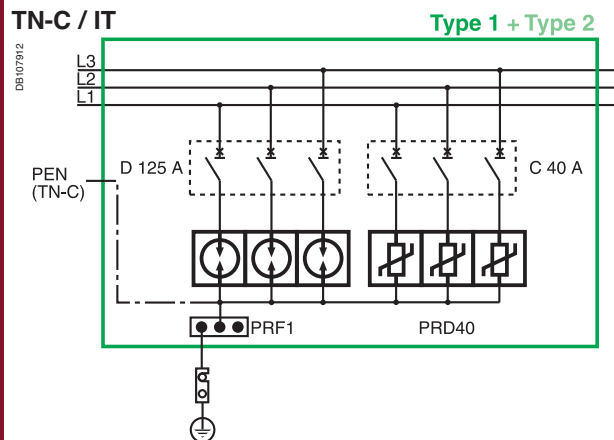
TN-S	Type 1	CB	+ Type 2	CB
Uc 1P+N 260 V	2x PRF1 1P 260 V (ref. 16621)	D125 A 2P (ref. 18532)	PRD40r 2P (ref. 16444)	2P 40 A curve C
3P+N	4x PRF1 1P 260 V (ref. 16621)	D125 A 4P (ref. 18534)	PRD40r 4P (ref. 16664)	4P 40 A curve C

TN-S/ IT (N)	Type 1	CB	+ Type 2	CB
Uc 1P+N 440 V	PRF1 1P+N 440 V (ref. 16625)	D125 A 2P (ref. 18532)	2x PRD40r 1P 440 V (ref. 16560)	2P 40 A curve C
3P+N	PRF1 3P+N 440 V (ref. 16628)	D125 A 4P (ref. 18534)	PRD40r 4P (ref. 16597)	4P 40 A curve C

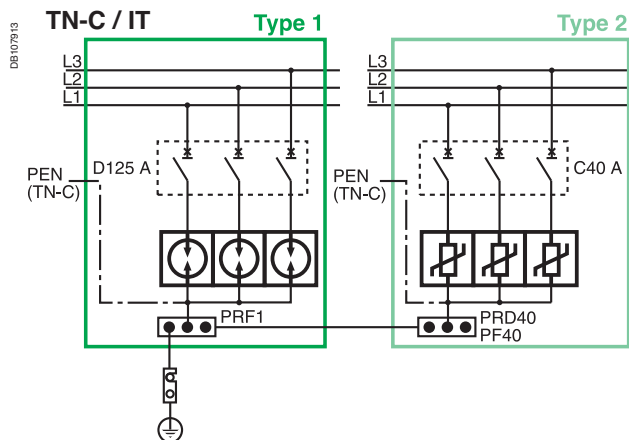
PRF1 Type 1 surge arrester and Type 2 surge arrester combination tables (cont.)

In the same switchboard

In two separate switchboards



TN-C	Type 1 ref.	CB	+ Type 2	CB
Uc 3P 260 V	3x PRF1 1P 260 V (3x ref. 16621)	D125 A 3P (ref. 18533)	PRD40r 3P 340 V (ref. 16445)	3P 40 A curve C
			PF40 3P (ref. 15582)	



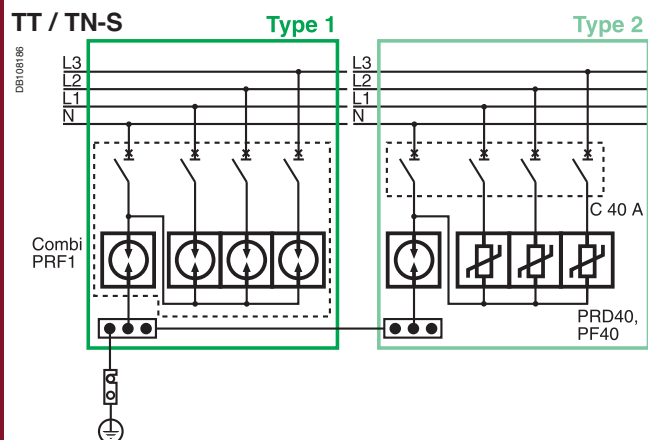
TN-C	Type 1	CB	+ Type 2	CB
Uc 3P 260 V	3x PRF1 1P 260 V (3x ref. 16621)	D125 A 3P (ref. 18533)	PRD40r 3P 340 V (3x ref. 16445)	3P 40 A curve C
			PF40 3P (ref. 15582)	

IT	Type 1	CB	+ Type 2	CB
Uc 3P 440 V	PRF1 3P 440 V (ref. 16627)	D125 A 3P (ref. 18533)	PRD40r 3P IT 460 V (ref. 16563)	3P 40 A curve C

IT	Type 1	CB	+ Type 2	CB
Uc 3P 440 V	PRF1 3P 440 V (ref. 16627)	D125 A 3P (ref. 18533)	PRD40r 3P IT 460 V (ref. 16563)	3P 40 A curve C

Combi PRF1 Type 1 surge arrester and Type 2 surge arrester combination table

In two separate switchboards



TT/TN-S	Type 1	CB	+ Type 2	CB
Uc 1P+N 260 V	Combi PRF1 1P+N (ref. 16626)	built-in	PRD40r 1P+N (ref. 16562)	2P 40 A curve C
			PF40 1P+N (ref. 15687)	
3P+N	Combi PRF1 3P+N (ref. 16629)	built-in	PRD40r 3P+N (ref. 16564)	4P 40 A curve C
			PF40 3P (ref. 15690)	

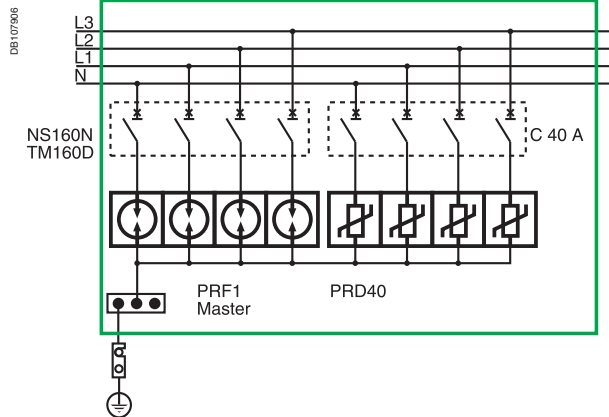
PRF1 Type 1 Master surge arrester and Type 2 surge arrester combination tables

In the same switchboard

In two separate switchboards

TT / TN-S / IT (+N)

Type 1 + Type 2

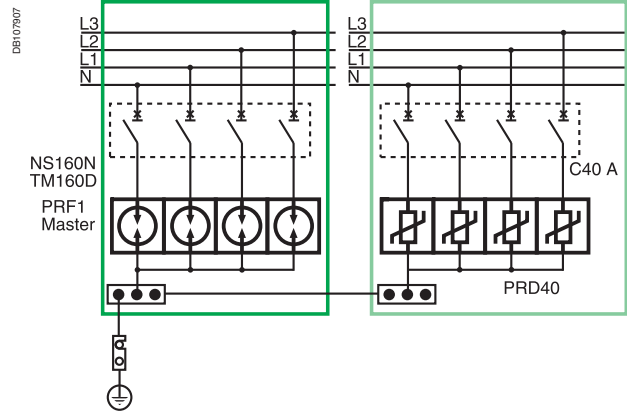


TT / TN-S / IT (N)	Type 1	CB	+ Type 2	CB
Uc 1P+N 440 V	2x PRF1 Master 1P 440 V (2x ref. 16630)	NS160N TM160D 2P (ref. 30620)	2x PRD40r 1P 440 V (2x ref. 16560)	2P 40 A curve C
3P+N	4x PRF1 Master 1P 440 V (4x ref. 16630)	NS160 TM160D 4P (ref. 30650)	PRD40r 1P IT 460 V (ref. 16597)	4P 40 A curve C

TN-S / IT (+N)

Type 1

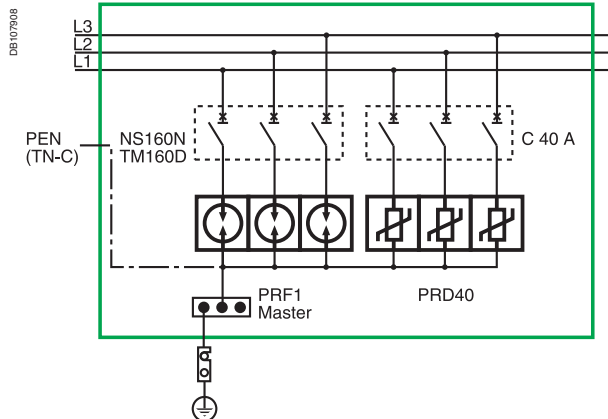
Type 2



TT / TN-S / IT (N)	Type 1	CB	+ Type 2	CB
Uc 1P+N 440 V	2x PRF1 Master 1P 440 V (2x ref. 16630)	NS160N TM160D 2P (ref. 30620)	2x PRD40r 1P 440 V (2x ref. 16560)	2P 40 A curve C
3P+N	4x PRF1 Master 1P 440 V (4x ref. 16630)	NS160 TM160D 4P (ref. 30650)	PRD40r 4P IT (ref. 16597)	4P 40 A curve C

TN-C / IT

Type 1 + Type 2

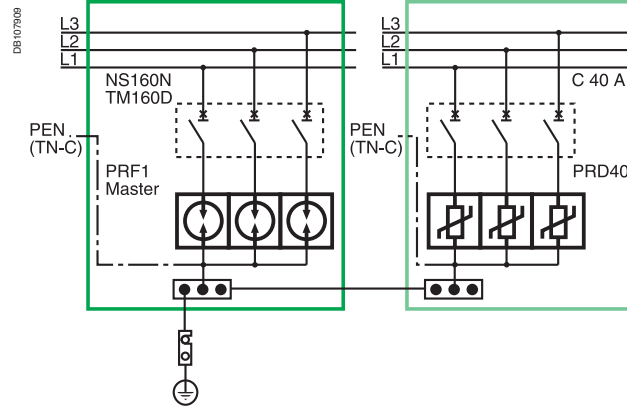


TN-C/IT	Type 1	CB	+ Type 2	CB
Uc 3P 440 V	3x PRF1 Master 1P 440 V (3x ref. 16630)	NS160N TM160D 3P (ref. 30630)	PRD40r 3P IT 460 V (ref. 16563)	3P 40 A curve C

TN-C / IT

Type 1

Type 2



TN-C/IT	Type 1	CB	+ Type 2	CB
Uc 3P 440 V	3x PRF1 Master 1P 440 V (3x ref. 16630)	NS160N TM160D 3P (ref. 30630)	PRD40r 3P IT 460 V (ref. 16563)	3P 40 A curve C

Surge arresters selection

Choosing surge arresters for: LV networks (cont.)

Type 1 surge arresters (class 1 test)

- PRF1 are dimensioned to conduct direct lightning currents with a 10/350 wave form
- PRF1 are surge arresters that use “encapsulated air-filled spark gap” type technology without arc device
- when the lightning current flows in the PRF1 surge arrester, a follow current (I_f) is created. If the value of current I_f is greater than the prospective short-circuit current at the installation point, the PRF1 surge arrester discharges by itself, without the help of the associated protective device. Otherwise, the protective device may trip. An OF indication auxiliary associated with the protective device should be provided to warn the user that loads are no longer protected as long as the protective device is not reset (see the “indication” section).
- the PRF1 Master surge arrester uses an “air spark gap” type technology with electronic arcing. Its main feature is its high level of protection and its good capacity to extinguish the 25 kA follow current without tripping the associated disconnection device. The extinction of the electrical arc is facilitated by sheet-metal element that divide the latter into several partial arcs. This technology increases the reliability of the operation and the availability of the protected installation.

Type 2 surge arresters (class 2 test)

- these surge arresters use “varistor” type technology or “varistor + gas-filled spark gap” technology
- they are dimensioned to conduct indirect lightning currents with an 8/20 wave form.

Choosing the disconnection device

- After having chosen the surge arrester(s) needed to protect the installation, the appropriate disconnection circuit-breaker is to be chosen from the opposite table:
- its breaking capacity must be compatible with the installation's breaking capacity
 - each live conductor must be protected example: a 1P+N surge arrester must be combined with a 2P disconnection device (2 protected poles)

Type 1 surge arresters

Type of surge arrester	Disconnection device
PRF1	D125 125 A curve D or fuse NH type gG (gL) 125 A
PRF1 Master	NS160N TM160D or fuse NH type gG (gL) 160 A
PRD1	C120

Type 2 surge arresters

Max. lightning discharge current	Disconnection circuit-breaker	
	Rating	Curve
65 kA	50 A	C
40 kA	40 A	C
20 kA	25 A	C
8 kA	20 A	C

Coordination between

Type 1 surge arresters (class 1 test) and Type 2 surge arresters (class 2 test)

To guarantee optimum protection of loads against direct effects (10/350 wave form) and surges (8/20 wave form), induced or conducted, Type 1 and Type 2 surge arresters must be installed in cascade.

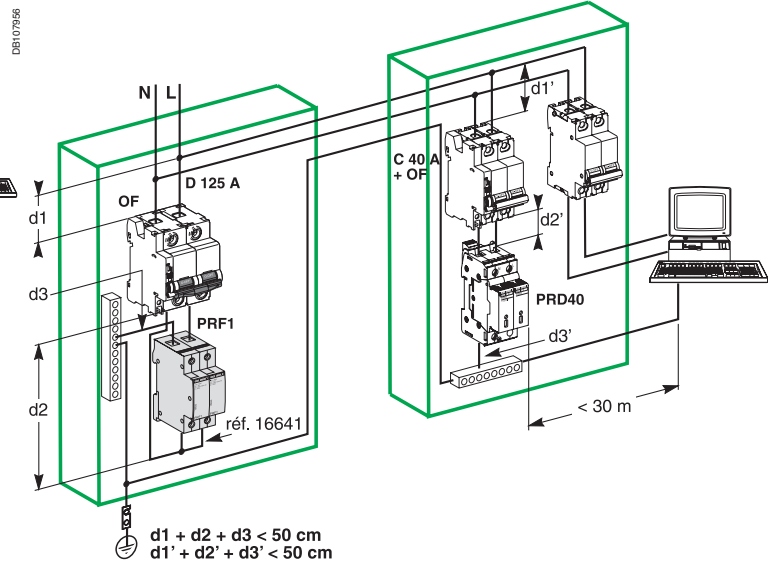
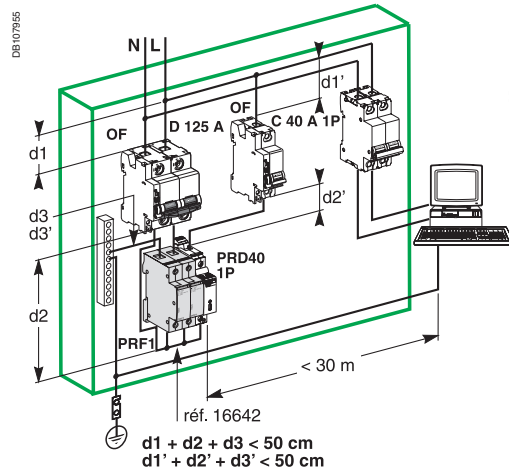
There are 2 cases:

- the Type 1 and Type 2 surge arresters are installed in the same switchboard:
 - the Type 1 surge arrester with air spark gap technology has the same steady state voltage (U_c) as the Type 2 surge arrester with varistors
 - the Type 1 surge arrester Neutral/PE pole is common to both surge arresters
- the Type 1 and Type 2 surge arresters are installed in two separate switchboards: The Type 1 surge arrester has the same steady state voltage (U_c) as the Type 2 surge arrester.

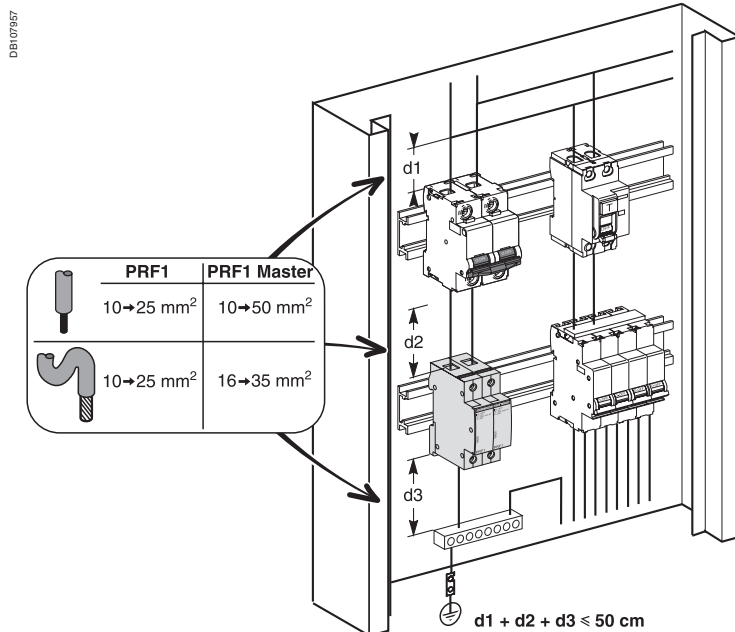
In both cases, each surge arrester is associated with its protective device. An OF opening indication auxiliary for the protection devices is recommended.

Installation constraints Type 1 surge arrester

If the distance between the box housing the Type 1 PRF1 surge arrester and the loads is greater than 30 m, then the Type 2 surge arrester (PF, PE, PRD, STM) must be assembled as close to the loads as possible.

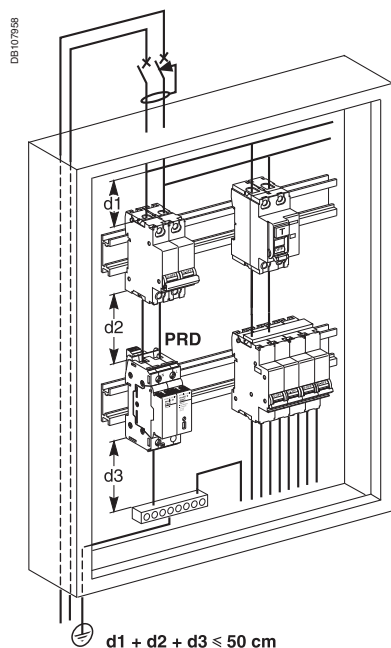


- The 50 cm rule also applies to the PRF1 surge arrester connection.



Surge arresters selection

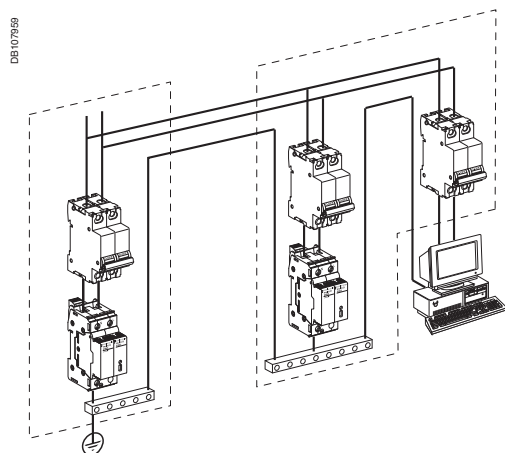
Choosing surge arresters for: LV networks (cont.)



Installation constraints Type 1 (PRD1) and Type 2 (PF, PRD) surge arrester

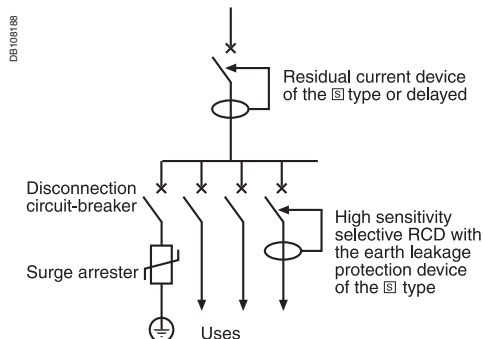
The 50 cm rule in the switchboard

Connections must be as short as possible. Do not exceed a distance of 50 cm, to efficiently protect electrical loads.



Co-ordinating 2 surge arresters (the 10 m rule)

In the case of an exposed site and the presence of sensitive loads, it is recommended to coordinate upstream and downstream protection in a cascading configuration.

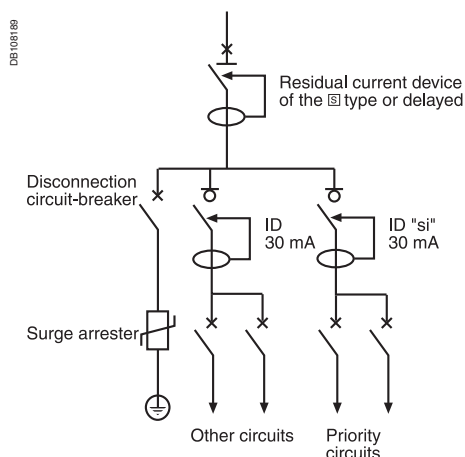


Case of earth leakage devices

In installations fitted out with a general earth leakage protection, it is preferable to place the surge arrester upstream from this protection.

However, certain power distributors do not allow intervention at this distribution level (this is for instance the case for LV subscribers in France).

It is therefore necessary to plan a selective device of the I type, or with delayed tripping, so that when the current runs off to the earth through the surge arrester, it does not produce nuisance tripping of the incoming circuit-breaker.

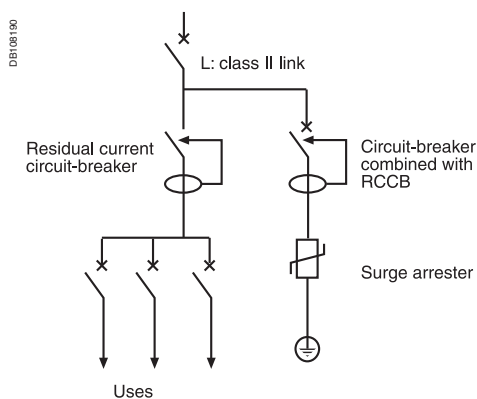


The best way to guarantee the continuity of supply of priority circuits, while ensuring safety in the case of atmospheric disturbances is to combine:

- a surge arrester that can protect sensitive loads against atmospheric overvoltages
- a circuit-breaker with an upstream earth leakage protection device of 300/500 mA selective, to ensure total earth leakage discrimination
- a residual current device of 30 mA I type placed downstream is insensitive to this type of disturbance.

Another solution can be foreseen: use a circuit-breaker (not earth leakage) at the incoming end of the installation followed by a residual current circuit-breaker. The surge arrester is to be connected between the two devices (see below).

Careful the link L must be class II.



Choice depending on the communication network

Type of network	Series PRC	PRI 12...48 V	PRI 6 V
Telecommunication			
Digital 300 Hz RTC			
Numeris access T0			
Specialised 24 V line			
Specialised modern line base band 64 kbit/s			
MIC line and access T2			
Computer			
Current loop 200 V			
Current loop 12...48 V			
RS 232 (12 V)			
RS 485 (12 V)			
Current loop 6 V			
ES 422 (6 V)			
RS 423 (6 V)			
Supply 12/48 V			
Fire safety centralising equipment, ELV load, intrusion centralising			

Surge arresters selection
Indications

Surge arrester end of life indication

A variety of indication devices are provided to warn the user that loads are no longer protected against atmospheric surges.

Type 1 surge arresters: PRF1 1P 260 V, Combi 1P+N and 3P+N and PRF1 Master with air spark gap technology

These surge arresters have an indicator that show whether the module is operating correctly. This indicator requires an operating voltage of min. 120 V AC. It does not come on:

- if the operating voltage is ≤ 120 V AC
- if there is no supply voltage
- if the arcing electronics are faulty.

Type 1 (PRD1) and Type 2 (PF, PRD) surge arresters (varistor, varistor + gas spark gap)

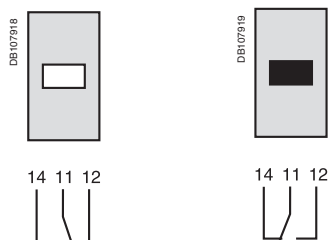
End of life takes the form of destruction of the surge arrester or cartridge.

This can be one of 2 types:

- internal end of life disconnection:
 - the accumulation of electrical shocks causes the varistors to age, which translates into a rise in the leakage current. Above 1 mA, there is thermal runaway and disconnection of the surge arrester
- external end of life disconnection:
 - is produced when an overvoltage is too energetic (lightning stroke directly on the line), above the surge arrester's flow capacity there where the varistors are placed in solid short-circuit with the earth (or possible between the phase and neutral)
 - this short-circuit is eliminated by opening of the disconnection circuit-breaker that must be associated.

Surge arresters for communication networks

The surge arrester is only at the end of life in short-circuit, following the accumulation of electrical shocks which causes it to age or following an overvoltage that is too energetic.



PRD65r, PRD40r and PRD20r surge arresters

These surge arresters include:

- a built-in NO/NC remote indication contact
- a mechanical indicator on the front panel:
 - white: normal operation (1)
 - red: cartridge to be immediately replaced (3).

Series PRD65, PRD40, PRD20, PRD8, PRC and PRI surge arresters

These surge arresters include:

- a mechanical indicator on front panel:
 - white: normal operation
 - red: surge arrester to be immediately replaced.

PRD surge arresters

These surge arresters include:

- a mechanical indicator on the front panel:
 - white: normal operation
 - red: cartridge is to be immediately replaced.

PF surge arresters

These surge arresters include:

- a built-in remote indication NC contact for the PF65r and PF30r models
- an green/red light indicator on the front panel:
 - green: normal operation
 - red: surge arrester to be immediately replaced.

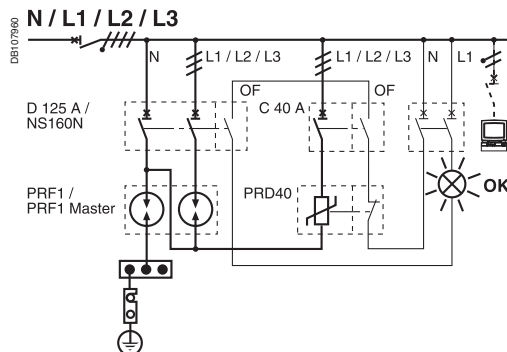


Diagram 1.

Protection device opening indication

Type 1 surge arresters

The Type 1 surge arrester protective device can be tripped in two cases:

- when the follow current (I_{fi}) extinguishing capacity of the surge arrester is less than the prospective short-circuit current of the installation
- when the Type 1 surge arrester is at the end of life (internal short-circuit). An OF indication transfer auxiliary is recommended to indicate opening of the protective device.

Type 2 surge arresters

The Type 2 surge arrester protective device can be tripped in event of end of life (internal short-circuit).

An OF indication transfer auxiliary is recommended to indicate opening of the protective device.

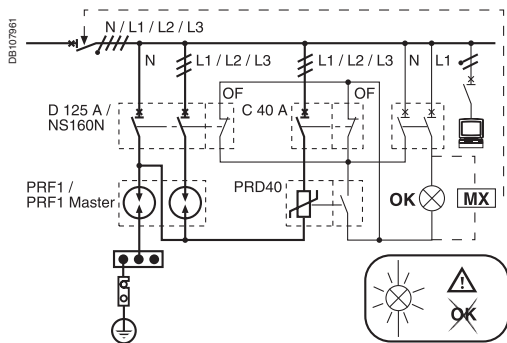


Diagram 2.

Optimum indication

Association PRF1 + PRD40

The consists of serial connecting the various indication auxiliaries:

- the OF contact of the Type 1 surge arrester protective device (diagrams 1 and 2)
- the OF contact of the Type 2 surge arrester protective device (diagrams 1 and 2)
- the transfer contact built into the PF65r, PF30r, PRD65r and PRD40r surge arresters (diagram 3)
- the EM/RM indication auxiliary (diagram 4).

Indication of proper operation of lightning protection by green indicator light.

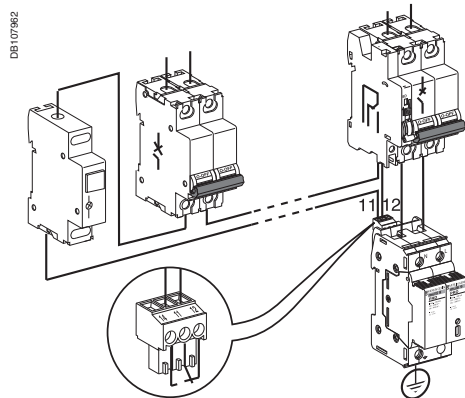


Diagram 3.

Indication of placing out of operation of lightning protection by red indicator light or indication by supply breaking (MX).

This diagram has the drawback of placing the entire installation out of operation as long as the surge arrester is not replaced or the protective device is not reset.

It cannot therefore be used in cases when continuity of supply is required (fire alarm, remote monitoring, etc.).

Note: an automatic recloser can be associated with the Type 1 surge arrester D125 protective device as per diagram 5.

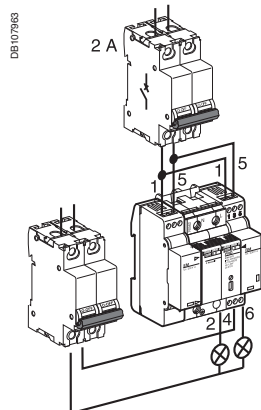


Diagram 4.

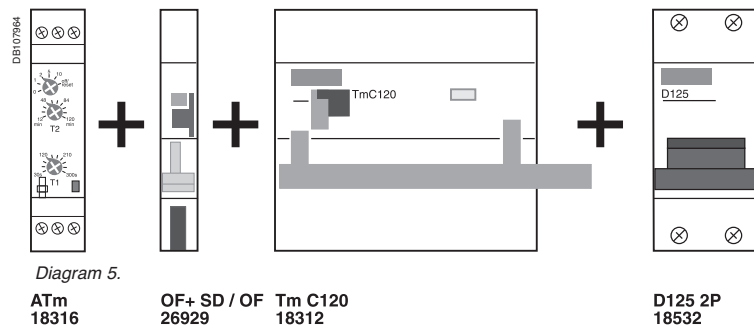


Diagram 5.

ATm
18316

OF+ SD / OF
26929

Tm C120
18312

D125 2P
18532

Who We Are

Schneider Electric

Your Worldwide Solution Provider!



Hive headquarters of Schneider Electric - France



Schneider Electric East Mediterranean is a subsidiary of Schneider Electric, the global specialist in energy management.

Operating in five East Mediterranean countries (Cyprus, Iraq, Jordan, Lebanon and Syria), the company has strengthened its forefront position in the region and sustains as well a growing business in 5 markets: Residential, Buildings, Industrial, Energy & Infrastructure and Data Centres & Networks.

Building automation & security, installation systems & control, energy monitoring & control and critical power & cooling services, are the new businesses that Schneider Electric added to its historical strength of Power & Control.

Energy management situated between energy production and energy usage is Schneider Electric's playground. It consists of providing solutions for greater energy efficiency by helping individuals and organizations make the most of their energy.

And this is exactly what we do!

Schneider Electric in brief

- > 15.8 billion Euros sales in 2009
- > More than 100,000 employees in more than 100 countries
- > 7300 Research & Development (R&D) people in 25 countries

Schneider Electric East Mediterranean in figures

- > 80 employees in 5 countries
- > 5 Customer Care Centres (CCC)

Schneider Electric East Mediterranean Key References

Cyprus

Larnaca International Airport	Infrastructure/ Airports
Ellisium Hotel- Pafos	Buildings/ Hotels
Electricity Authority Headquarters	Buildings/ Offices
Hellenik Bank Headquarters	Buildings/ Banks
Frou-Frou Factory	Industry
Zorpas Bakery	Industry
Lymbia Wastewater Treatment Plant	Water
Caramondanis Desalination ⁽¹⁾	Water
Frenaros Water Pumping	Water
Electricity Authority of Cyprus	Electrical Energy



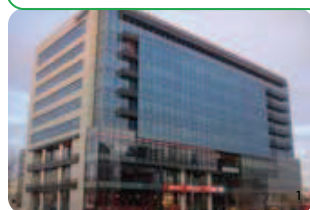
Iraq

SNAFEE – 4 Substations, Ministry of Electricity	Power
Ministry of Electricity (MOE) (Rehabilitation)	Energy
MOE - South Electricity Distribution	Energy
MOE - (4 New Substations)	Energy
MOE - Middle Electricity Distribution (MED) (52 Kiosks)	Energy
MOE - MED (4000 Compact NS)	Energy
MOE - Baghdad Electricity Distribution-Karakh	Energy
MOE - Basrah and Naseriyah Directorates	Energy
MOE - (New substation)	Energy
Gulf Regional Division	Energy
MOE - MED (3000 housing panels)	Buildings
Ministry Of Science, Jadria site	Buildings
Ifray Water Treatment	Water
AL Jazira Pumping Station	Industry
Sidcco Erbil & Sulaymaniah Refinery	Oil & Gas



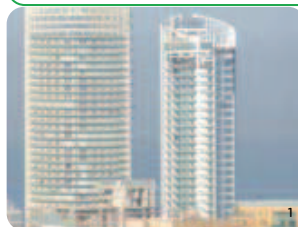
Jordan

Holiday Inn Dead Sea Hotel	Buildings/ Hotels
Intercontinental Aqaba Hotel	Buildings/ Hotels
Prince Hashem Hospital	Buildings/ Hospitals
Pediatric Hospital	Buildings/ Hospitals
Karakas Commercial Centre	Buildings/ Commercial
Arab Open University	Buildings/ Education
City Mall	Buildings/ Commercial
Immar Tower	Buildings/ Offices
Abu Tawila Plaza ⁽¹⁾	Buildings/ Offices
Al Hijaz Towers ⁽²⁾	Buildings/ Commercial
Arab Bank Headquarters	Buildings/ Banks
United Cable Factory	Industry
Pepsi Plant Expansion	Industry
Al Itihad Glass Factory	Industry
Gulf Agricultural Est.	Industry
IDECO	Energy/Utility
Queen Alia International Airport	Infrastructure/ Airports
Andalusia Residential Village	Residential



Lebanon

Raidy Printing Press	Industry
Holcim Plant	Industry
Sidon Projects	Water
Nabatieh Wastewater Treatment Plant	Water
Ras Nabi Younes Wastewater Treatment Plant	Water
Tripoli Desalination Plant	Water
Port of Beirut	Infrastructure/ Ports
Four Seasons Beirut ⁽¹⁾	Buildings/ Hotels
Clemenceau Medical Centre	Buildings/ Medical Centres
Hotel Dieu de France	Buildings/ Hospitals
Habtoor Grand Hotel ⁽²⁾	Buildings/ Hotels
Notre Dame University	Buildings/ Education & Research
USJ, Faculty of Letters and Human Sciences	Buildings/ Education & Research
Dora Commercial Centre	Buildings/Commercial
Atrium, Downtown	Buildings/ Offices
Bloc 24, Downtown	Residential



Syria

PCE/PGA – Custom Made cubicles to Aleppo	Power
PCE/PGA – Retrofit Plug & Play Solution	Power
Damascus 8 th Gate	Buildings/Complex
Al Bahra Steel Factories ⁽¹⁾	Industry
El Swedy Cables and Transformers Factory ⁽²⁾	Industry
Ben Laden Pre-cast, UTC, UCP	Industry
Zanoubia Ceramic Factory	Industry
Homs Gas Station	Oil & Gas
Tal Adas Project Automation	Oil & Gas
Edleb Water Authority	Water
Afamia Hotel and Resort, Latakia	Buildings/ Hotels
Heart Hospital, Aleppo	Buildings/ Hospitals
Techreen University Hospital Project ⁽³⁾	Buildings/ Hospitals
Al Herafeien Hospital	Buildings/ Hospitals
Areeba Mobile Stations	Buildings/ Offices
Al Diafeh Villas	Residential



How to Contact Us

Schneider Electric East Mediterranean s.a.l. - Regional Office
Tabaris Square, Charles Malek Avenue, Ashadia Building, 10th Floor
P.O Box : 166223, Beirut, Lebanon
Tel. +961 1 20 45 02
Fax +961 1 20 44 58

Schneider Electric East Mediterranean s.a.l. - Cyprus Office
28 General Timayia Avenue, Kyriakos Building, Block A, Office 301
Larnaca 6046
P.O.Box : 40411, Larnaca 6304, Cyprus.
Tel. +357 24 812646
Fax +357 24 637382

Customer Care Centre
Tel. +357 24 812649
customer care.cy@schneider-electric.com

Schneider Electric East Mediterranean s.a.l. - Iraq Office
Behind Safeway, Villa #26 - Al Abdali Area, Shmeisani, on the cross
of Wadee' Al Bustani, Street & Al Maqdesi Street - Amman, Jordan
Tel. +962 6 5167887 / +962 6 5166360
Fax +962 6 5167911

Customer Care Centre
Tel. +962 6 5166260
customer care.iq@schneider-electric.com

Schneider Electric East Mediterranean s.a.l. - Jordan Office
Behind Safeway, Villa #26 - Al Abdali Area, Shmeisani, on the cross
of Wadee' Al Bustani, Street & Al Maqdesi Street - Amman, Jordan
Tel. +962 6 5167887 / +962 6 5166360
Fax +962 6 5167911

Customer Care Centre
Tel. +962 6 5166465
customer care.jo@schneider-electric.com

Schneider Electric East Mediterranean s.a.l. - Lebanon Office
Tabaris Square, Charles Malek Avenue, Ashadia Building, 7th Floor
P.O Box : 166223, Beirut, Lebanon
Tel. +961 1 20 46 20
Fax +961 1 20 31 19

Customer Care Centre
Tel. +961 1 321645
customer care.lb@schneider-electric.com

Schneider Electric East Mediterranean s.a.l. - Syria Office
Mazze Eastern Villas, Eskandariah Street, Beside Al Huda Building,
Damascus, Syria
Tel. +963 11 6127231 - 32 - 33
Fax +963 11 6127230
Baghdad Station, Al Shalal Street, Al Tawhid Mosque, Future Kids
Building, 1st Floor, Aleppo, Syria
Tel. +963 21 2233915 - 6
Fax +963 21 2274948

Customer Care Centre
Tel. +963 11 6124799
customer care.sy@schneider-electric.com

**Schneider Electric
East Mediterranean
Customer Care Centre (CCC)**

- > Commercial and general information
- > Technical support
- > Logistics and deliveries
- > Feedback and suggestions

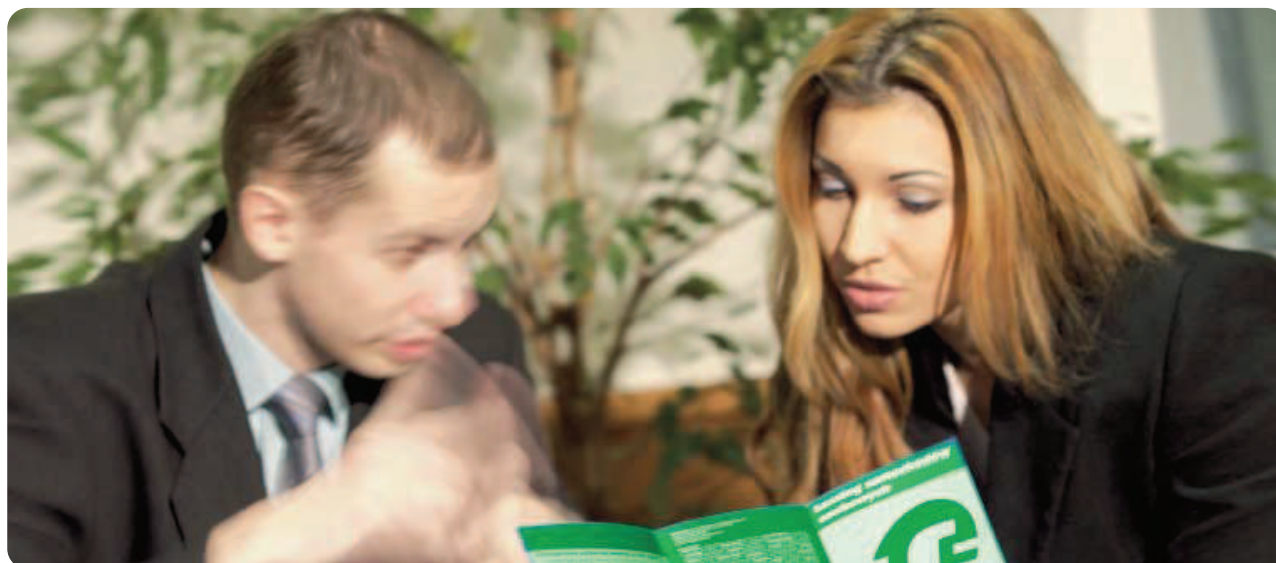


*Just try us, we leave
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For more information,
please visit Schneider Electric website:

www.eastmed.schneider-electric.com

Technical Publications



You may request the technical publications from our Customer Care Centre

Reference	Description
• EIGED306001EN	<i>Electrical Installation Guide</i>
• EMEDDOCA0509EN	<i>Household Switchboards Domae</i>
• ABTED305161EN	<i>LV Complementary Technical Information</i>
• ABTED201147EN	<i>LV Circuit Breakers and Switch Disconnectors from 80 to 3200 A Compact NS</i>
• ABTED200143EN	<i>LV Circuit Breakers and Switch Disconnectors Masterpact NT & NW</i>
• ABTED290614V1EN	<i>LV Product Characteristics</i>
• DIA1ED1060708EN	<i>Starter Controller TeSys U</i>
• DIA3ED2051002EN	<i>Smart Relay Zelio Logic</i>
• EMEDTE0704EN	<i>Motor Starters Selection Guide Variable Speed Drives & Soft Starters</i>
• DIA1ED1060402EN	<i>TeSys GV2 - GV3</i>
• MKTED205103EN	<i>Motor Starter Solutions Control & Protection Components</i>
• DIA1ED2060503EN	<i>Motor Circuit Breakers-TeSys GV2, GV3 & GV7</i>



Emergency Lighting Catalogue
ref.: EMEDZCL0508EN



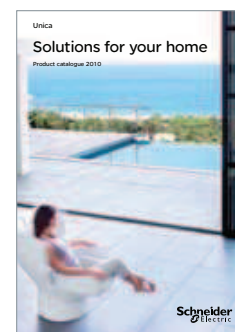
Electrical solutions for residential premises
New Mini Pragma Electrical Enclosure
ref.: EMEDMPBR0510EN



Merten Catalogue 2010
ref.: ABTED305161EN



Domae Catalogue
ref.: EMEDDOCA0509EN



Unica Catalogue 2010
ref.: EMEDUCA0810EN