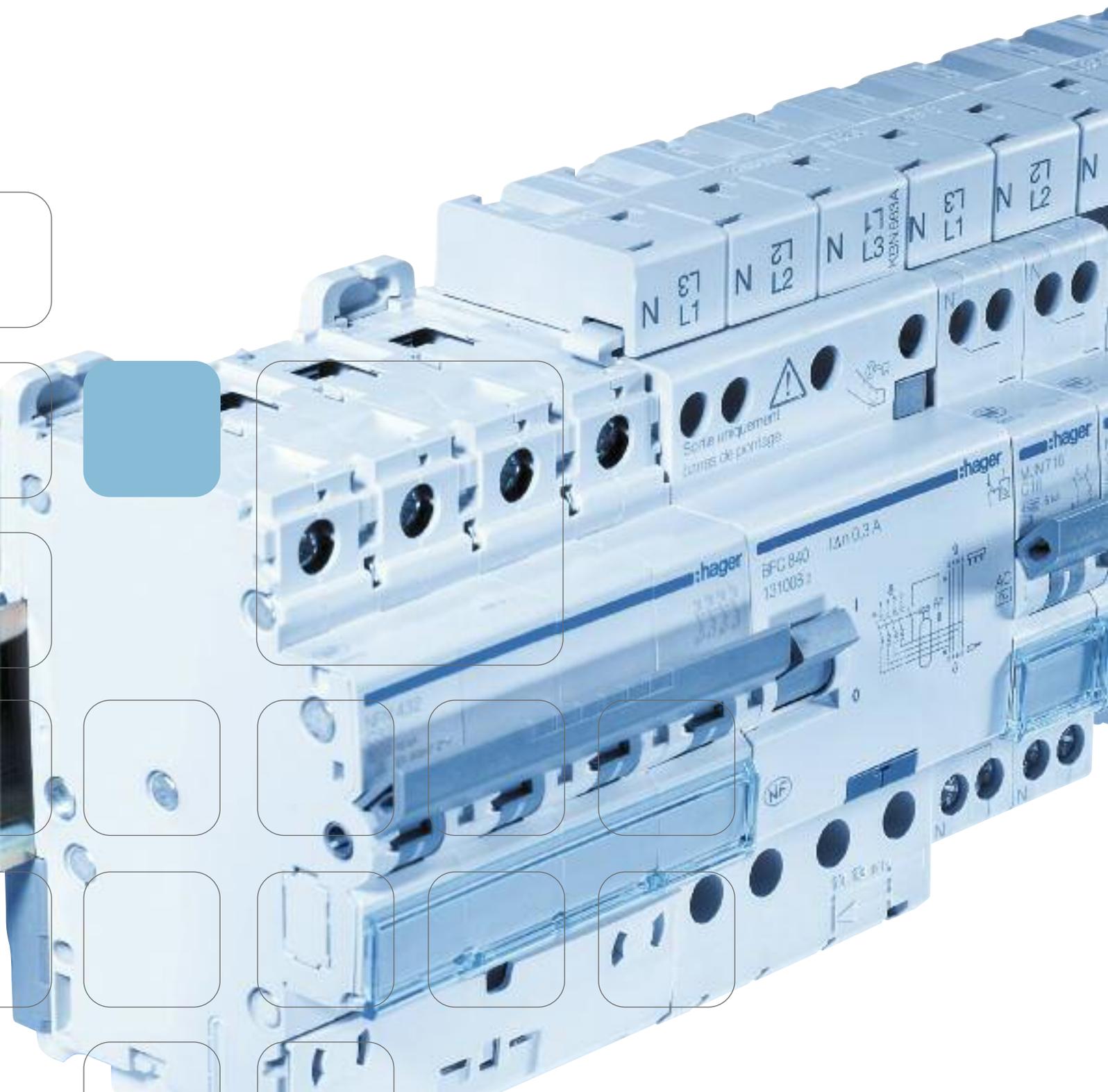


# Protection devices

## the complete solution

Hager offers a wide range of protection devices, such as miniature circuit breakers, auxiliaries and accessories, RCD add-on blocks, single pole and switched neutral devices, 2 and 4 pole RCCBs, RCCB auxiliaries, RCBOs, HRC fuse carriers, motor starters, earth leakage relays and surge protection devices.



C3	Miniature circuit breakers
C16	Remote control auxiliary and auto reclosing remote control auxiliary
C17	Auxiliaries and accessories for MCBs & RCCBs
C23-24	RCD add-on blocks
C26	2 & 4 pole residual current devices (RCCBs/ELCBs)
C27	RCCBs selective product range
C28 29	Combined MCB/RCD (RCBO)
C30	RCBO electronic
C33	Earth leakage relays & torroidal transformers
C37	BS 1361 HRC fuse carriers and fuse
C38	HRC fuse carriers and fuses
C39	L51-L58 HRC fuse carries & switchfuse
C40	Motor starters
C42	Photovoltaic fuse carriers, SPD & switch disconnectors
C43	Surge protective dvices type 2
C44	Surge protective devices for general protection
C44	Replacement cartridges for SPDs with plug in cartridge
C45	Monobloc surge protection devices
C46	Surge protective devices with low voltage protection level
C46	Surge protective devices for telephone lines
C47	Switches disconnectors
C48	2 way/centre off changover moduar switches
C55	Enclosed fuse combination switches and switch disconnectors
C58	Control relays

**Description**  
Protection and control of circuits against overloads and short circuits in domestic, commercial and industrial applications.

**Technical data**  
C curve tripping  
Current rating : 1-63A

**Breaking capacity :**  
4.5kA IEC898  
6kA IEC947-2  
10KAIC NEMA AB-1  
Reference calibration  
Temperature : 30°C  
Voltage rating : 230/400V  
Mechanical endurance :  
20 000 operations

**Connection capacity :**  
25mm<sup>2</sup> rigid conductor  
16mm<sup>2</sup> flexible conductor  
Will accept accessories, shunt Trips, auxiliary contact.  
see page 12

**Approval :**  
KEMA  
ST, SNI, LMK

Designation	In/A	Width in I 17.5mm	Pack qty.	Cat. Ref
 Single pole MCB 	1	1	12	MY101E
	2	1	12	MY102E
	3	1	12	MY103E
	4	1	12	MY104E
	6	1	12	MY106E
	10	1	12	MY110E
	16	1	12	MY116E
	20	1	12	MY120E
	25	1	12	MY125E
	32	1	12	MY132E
	40	1	12	MY140E
	50	1	12	MY150E
	63	1	12	MY163E

MY106E

 Double pole MCB 	1	2	6	MY201E
	2	2	6	MY202E
	3	2	6	MY203E
	4	2	6	MY204E
	6	2	6	MY206E
	10	2	6	MY210E
	16	2	6	MY216E
	20	2	6	MY220E
	25	2	6	MY225E
	32	2	6	MY232E
	40	2	6	MY240E
	50	2	6	MY250E
	63	2	6	MY263E

MY232E

 Triple pole MCB 	1	3	4	MY301E
	2	3	4	MY302E
	3	3	4	MY303E
	4	3	4	MY304E
	6	3	4	MY306E
	10	3	4	MY310E
	16	3	4	MY316E
	20	3	4	MY320E
	25	3	4	MY325E
	32	3	4	MY332E
	40	3	4	MY340E
	50	3	4	MY350E
63	3	4	MY363E	

MY316

**Description**  
Protection and control of circuits against overloads and short circuits in domestic, commercial and industrial applications.

**Technical data**  
MTxxxA = type B tripping  
MUxxxA = type C tripping  
according to IEC898 and BSEN 60-898

Reference calibration  
Temperature : 30°C

**Breaking capacity :**  
6kA IEC898  
10kA IEC 947-2  
22KAIC NEMA AB-1  
Voltage rating : 230/400V  
Current rating : 2-63A  
Mechanical endurance :  
20 000 operations

**Connection capacity :**  
25mm<sup>2</sup> rigid conductor  
16mm<sup>2</sup> flexible conductor

Will accept accessories, shunt trips, auxiliary contact.

**Approval :**  
KEMA  
SNI  
LMK



MT106A

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref. B curve	Cat. Ref. C curve
Single pole MCB 	2	1	12	-	MU102A
	4	1	12	-	MU104A
	6	1	12	MT106A	MU106A
	10	1	12	MT110A	MU110A
	16	1	12	MT116A	MU116A
	20	1	12	MT120A	MU120A
	25	1	12	MT125A	MU125A
	32	1	12	MT132A	MU132A
	40	1	12	MT140A	MU140A
	50	1	12	MT150A	MU150A
	63	1	12	MT163A	MU163A



MT232A

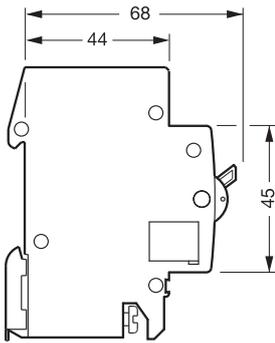
Double pole MCB 	2	2	6	-	MU202A
	4	2	6	-	MU204A
	6	2	6	MT206A	MU206A
	10	2	6	MT210A	MU210A
	16	2	6	MT216A	MU216A
	20	2	6	MT220A	MU220A
	25	2	6	MT225A	MU225A
	32	2	6	MT232A	MU232A
	40	2	6	MT240A	MU240A
	50	2	6	MT250A	MU250A
	63	2	6	MT263A	MU263A



MT363A

Triple pole MCB 	2	3	4	-	MU302A
	4	3	4	-	MU304A
	6	3	4	MT306A	MU306A
	10	3	4	MT310A	MU310A
	16	3	4	MT316A	MU316A
	20	3	4	MT320A	MU320A
	25	3	4	MT325A	MU325A
	32	3	4	MT332A	MU332A
	40	3	4	MT340A	MU340A
	50	3	4	MT350A	MU350A
	63	3	4	MT363A	MU363A

# Miniature circuit breakers 10kA type B & C - NB NC



**Description**  
Protection and control of circuits against overloads and short circuits in domestic, commercial and industrial electrical distribution systems.

**Technical data**  
NBxxxA = type B tripping  
NCxxxA = type C tripping  
according to IEC898 and BSEN 60-898

**Breaking capacity :**  
10kA according to IEC898  
15kA according to IEC947-2  
  
30kAIC according to NEMA AB-1  
Reference calibration  
Temperature : 30°C  
Voltage rating : 230/400V  
Current rating : 0.5 - 63A  
Mechanical endurance :  
20 000 operations

Positive contact indication  
Red - contacts closed  
Green - contacts open  
Will accept accessories, shunt trips, auxiliary contact.  
see page 12

**Connection capacity**  
(up to 63A) :  
25mm<sup>2</sup> rigid conductor  
16mm<sup>2</sup> flexible conductor

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref. B curve	Cat. Ref. C curve
	<b>Single pole MCB</b>				
	0.5	1	12	-	NC100A
	1	1	12	-	NC101A
	2	1	12	-	NC102A
	3	1	12	-	NC103A
	4	1	12	-	NC104A
	6	1	12	NB106A	NC106A
	10	1	12	NB110A	NC110A
	16	1	12	NB116A	NC116A
	20	1	12	NB120A	NC120A
	25	1	12	NB125A	NC125A
	32	1	12	NB132A	NC132A
	40	1	12	NB140A	NC140A
	50	1	12	NB150A	NC150A
63	1	12	NB163A	NC163A	
	<b>Double pole MCB</b>				
	0.5	2	6	-	NC200A
	1	2	6	-	NC201A
	2	2	6	-	NC202A
	3	2	6	-	NC203A
	4	2	6	-	NC204A
	6	2	6	NB206A	NC206A
	10	2	6	NB210A	NC210A
	16	2	6	NB216A	NC216A
	20	2	6	NB220A	NC220A
	25	2	6	NB225A	NC225A
	32	2	6	NB232A	NC232A
	40	2	6	NB240A	NC240A
	50	2	6	NB250A	NC250A
63	2	6	NB263A	NC263A	
	<b>Triple pole MCB</b>				
	0.5	3	4	-	NC300A
	1	3	4	-	NC301A
	2	3	4	-	NC302A
	3	3	4	-	NC303A
	4	3	4	-	NC304A
	6	3	4	NB306A	NC306A
	10	3	4	NB310A	NC310A
	16	3	4	NB316A	NC316A
	20	3	4	NB320A	NC320A
	25	3	4	NB325A	NC325A
	32	3	4	NB332A	NC332A
	40	3	4	NB340A	NC340A
	50	3	4	NB350A	NC350A
63	3	4	NB363A	NC363A	
	<b>Four pole MCB</b>				
	0.5	4	3	-	NC400A
	1	4	3	-	NC401A
	2	4	3	-	NC402A
	3	4	3	-	NC403A
	4	4	3	-	NC404A
	6	4	3	NB406A	NC406A
	10	4	3	NB410A	NC410A
	16	4	3	NB416A	NC416A
	20	4	3	NB420A	NC420A
	25	4	3	NB425A	NC425A
	32	4	3	NB432A	NC432A
	40	4	3	NB440A	NC440A
	50	4	3	NB450A	NC450A
63	4	3	NB463A	NC463A	



NB110A NC110A



NC210A



NC310A



NB410A

MCBs rating from 0.5 to 63A curve "D"

These miniature circuit breakers are used in commercial and industrial electrical distribution systems.

MCBs ensure the protection against short circuit and overload current and the control and isolation of circuits.

Curve D tripping:  
10 to 20 times the rated current: for installations containing loads with high inrush currents (motors, transformers, ...)

Ranges:  
NDN curve "D" 10000 IEC898  
15kA IEC947-2 from 0.5 to 63A

The new architecture of terminal guarantees an excellent grip of the cables and a good tightening comfort.

The pull up terminal is a fool-proof terminal which allows:

- to avoid a bad insertion of cables in the product
- to guide the cable in the terminal

The tripping mechanism is totally new. with a fast system of closing, the withstand of contacts on all type of loads is increased.

On the MCB, the state of isolation (according to IEC 947-2) is clearly indicated by the "OFF" mechanical position on the toggle with green colour.

NDN range

- Busbar connection:
  - on the top with prong busbar
  - on the bottom, the MCBs are equipped with bi-connet terminals which allow connection with a fork busbar and a supply cable in the terminal. The busbar clip-on mechanically onto the casing of the MCB.
- Top and bottom removability: thanks to new Din clips, an MCB can be added or removed easily in a row of products connected together with a busbar in case of maintenance or extension
- Identification of the electrical circuits can be easily done on the front of all MCBs thanks to a specific window on each product.

Voltage rating: 230/400V AC

Insulation voltage (Ui): 630V

Impulse voltage (Uimp): 6kV

Durability: 20,000 cycles (O-C)

Calibration temperature: 30°C

Connection capacity:  
- 25<sup>□</sup> flexible conductor  
- 35<sup>□</sup> rigid conductor  
Foolproof terminal design

Tightening torque:  
4 Nm nominal

Screw head: PZ2 and slot 6mm

IP rating: IP2x terminals

Standard 35mm DIN rail

Option:

Auxiliaries:

- allows remote indication of main contact position
- allows remote tripping of the associated device
- Locking kit to lock the toggle in the ON or OFF position
- Terminal & screw shield and interpole barrier
- RCD add-on block
- Busbar and connection accessories

Breaking capacity according to IEC60898 & IEC60947-2

Number of poles	Voltage(V)	NDN Breaking capacity Icn IEC 60898	Breaking capacity Icu IEC 947-2
1P	230 to 240	10,000	15kA
	400 to 415	-	-
2P, 3P, 4P	230 to 240	-	30kA
	400 to 415	10,000	15kA

Breaking capacity according to IEC60947-2 for low ratings

Breaking	NDN Breaking capacity Icu IEC 947-2
0.5 - 2A	80kA
3A - 4A	50kA
6A	30kA

# Miniature circuit breakers

D curve: IEC 60898: 10000 and IEC 60947-2: 15KA



**Description**  
Protection and control of circuits against overloads and short circuits in commercial and industrial electrical distribution systems.

**Technical data**  
NDNxxxA = type D tripping according to IEC898 and BSEN 60-898

**Breaking capacity :**  
10kA according to IEC898  
15kA according to IEC947-2  
  
30kAIC according to NEMA AB-1  
Reference calibration  
Temperature : 30°C  
Voltage rating : 230/400V  
Current rating : 0.5 - 63A  
Mechanical endurance :  
20 000 operations

**Positive contact indication**  
Red - contacts closed  
Green - contacts open  
Will accept accessories, shunt trips, auxiliary contact.  
see page 12

**Connection capacity**  
(up to 63A) :  
25mm<sup>2</sup> rigid conductor  
16mm<sup>2</sup> flexible conductor

Designation	In/A	Width in I 17.5mm	Pack qty.	Cat. Ref.	
 NDN116A	Single pole MCB	0.5	1	12	NDN100A
		1	1	12	NDN101A
		2	1	12	NDN102A
		3	1	12	NDN103A
		4	1	12	NDN104A
		6	1	12	NDN106A
		10	1	12	NDN110A
		16	1	12	NDN116A
		20	1	12	NDN120A
		25	1	12	NDN125A
		32	1	12	NDN132A
		40	1	12	NDN140A
		50	1	12	NDN150A
		63	1	12	NDN163A

 NDN 232A	Double pole MCB	0.5	2	6	NDN200A
		1	2	6	NDN201A
		2	2	6	NDN202A
		3	2	6	NDN203A
		4	2	6	NDN204A
		6	2	6	NDN206A
		10	2	6	NDN210A
		16	2	6	NDN216A
		20	2	6	NDN220A
		25	2	6	NDN225A
		32	2	6	NDN232A
		40	2	6	NDN240A
		50	2	6	NDN250A
		63	2	6	NDN263A

 NDN320A	Triple pole MCB	0.5	3	4	NDN300A
		1	3	4	NDN301A
		2	3	4	NDN302A
		3	3	4	NDN303A
		4	3	4	NDN304A
		6	3	4	NDN306A
		10	3	4	NDN310A
		16	3	4	NDN316A
		20	3	4	NDN320A
		25	3	4	NDN325A
		32	3	4	NDN332A
		40	3	4	NDN340A
		50	3	4	NDN350A
		63	3	4	NDN363A

# Miniature circuit breakers

D curve: IEC 60898: 10000 AND IEC 60947-2: 15KA



NDN463A

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref.
Four pole MCB	0.5	4	3	NDN400A
	1	4	3	NDN401A
	2	4	3	NDN402A
	3	4	3	NDN403A
	4	4	3	NDN404A
	6	4	3	NDN406A
	10	4	3	NDN410A
	13	4	3	NDN413A
	16	4	3	NDN416A
	20	4	3	NDN420A
	25	4	3	NDN425A
	32	4	3	NDN432A
40	4	3	NDN440A	
50	4	3	NDN450A	
63	4	3	NDN463A	

## Accessories for miniature circuit breaker NDNxxxA and NRNxxx



MZN120

Designation	Pack qty.	Cat. Ref.
<b>Terminal shield/screw shield</b> Prevents access to device terminals this accessory can be sealed on each pole	4	MZN120



MZN121

<b>Inter-pole barrier</b> Allows a clear isolation between poles depending on the connection used	1 set of 3 inter-pole barriers	MZN121
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# Miniature circuit breakers 15 to 25kA type C - NRN



Type C tripping 25kA ( $\leq 25A$ )  
20kA (32-40A)  
15kA (50-63A)

to IEC 60947-2

Current rating:  
0.5 to 63A

Tripping curve:  
Type C magnetic setting

Applications:  
Commercial and industrial appli-  
cations.

Connection capacity  
16mm<sup>2</sup> flexible conductor  
25mm<sup>2</sup> rigid conductor  
Complies with IEC 60947-2

Accessories  
- RCDs add-on blocks  
- Auxiliaries



NRN116

Designation	Breaking capacity kA	In/A	Width in I 17.5mm	Pack qty.	Cat. Ref.
Single pole MCB 	25	0.5	1	12	NRN100
	25	1	1	12	NRN101
	25	2	1	12	NRN102
	25	3	1	12	NRN103
	25	4	1	12	NRN104
	25	6	1	12	NRN106
	25	10	1	12	NRN110
	25	16	1	12	NRN116
	25	20	1	12	NRN120
	25	25	1	12	NRN125
	20	32	1	12	NRN132
	20	40	1	12	NRN140
	15	50	1	12	NRN150
	15	63	1	12	NRN163



NRN232

Double pole MCB 	25	0.5	2	6	NRN200
	25	1	2	6	NRN201
	25	2	2	6	NRN202
	25	3	2	6	NRN203
	25	4	2	6	NRN204
	25	6	2	6	NRN206
	25	10	2	6	NRN210
	25	16	2	6	NRN216
	25	20	2	6	NRN220
	25	25	2	6	NRN225
	20	32	2	6	NRN232
	20	40	2	6	NRN240
	15	50	2	6	NRN250
	15	63	2	6	NRN263



NRN320

Triple pole MCB 	25	0.5	3	4	NRN300
	25	1	3	4	NRN301
	25	2	3	4	NRN302
	25	3	3	4	NRN303
	25	4	3	4	NRN304
	25	6	3	4	NRN306
	25	10	3	4	NRN310
	25	16	3	4	NRN316
	25	20	3	4	NRN320
	25	25	3	4	NRN325
	20	32	3	4	NRN332
	20	40	3	4	NRN340
	15	50	3	4	NRN350
	15	63	3	4	NRN363



NRN440

Four pole MCB 	25	0.5	4	3	NRN400
	25	1	4	3	NRN401
	25	2	4	3	NRN402
	25	3	4	3	NRN403
	25	4	4	3	NRN404
	25	6	4	3	NRN406
	25	10	4	3	NRN410
	25	16	4	3	NRN416
	25	20	4	3	NRN420
	25	25	4	3	NRN425
	20	32	4	3	NRN432
	20	40	4	3	NRN440
	15	50	4	3	NRN450
	15	63	4	3	NRN463

# Miniature circuit breakers

## Type C SP & N - ML

**Description**  
Protection and control of circuits against overloads and short circuits.

**Technical data**  
Type C tripping characteristics  
Breaking capacity : 6000A to IEC898  
Voltage rating : 230V  
Current rating : 6-32A

**Connection capacity**  
16mm<sup>2</sup> rigid cables  
10mm<sup>2</sup> flexible cables + busbars



ML516J

Designation	In/A 17.5mm	Width in   qty.	Pack	Cat. Ref.
SP&N MCB - 6kA	6	1	12	ML506J
SP&N	10	1	12	ML510J
	16	1	12	ML516J
	20	1	12	ML520J
	25	1	12	ML525J
	32	1	12	ML532J

## Thermal magnetic circuit breakers

curves “B” - “C” - “D”

### In 80 to 125 A

These circuit breakers are intended for the protection of the circuits against overloads and short circuits in professional premises (from residential to commercial and industrial premises).

The circuit breakers curve “B” are particularly recommended for the circuits with long cable length and for residential loads with low in-rush current.

The circuit breakers curve “C” are adapted to the protection of the circuits in professional premises.

The circuit breakers curve “D” are particularly adapted to the protection of the circuits where the installations are subject to high in-rush currents.

- HMB curve “B” 15000  
15 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

- HMC curve “C” 15000  
15 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

- HMD curve “D” 15000  
15 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

- HMK curve “C”  
30 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

- HMX curve “C”  
50 kA of 16 - 63 A :  
width 1.5 ■ / pole

- HLE curve “B” 10000  
10 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

- HLF curve “C” 10000  
10 kA of 80 - 100 - 125 A :  
width 1.5 ■ / pole

These circuit breakers are equipped with reinforced screw cages.

A label holder is integrated under the handle to ensure the location of the product.

The “OFF” position is clearly shown by a green indicator below the handle.

Suitable for isolation (according to IEC 60947-2) : the isolation of the circuit breakers is indicated by a green indicator on the handle.

These circuit breakers have quick closing : fast and simultaneous closing of the contacts, independent of the handling speed.

That increases the life of the circuit breaker whatever the type of load.

**Nominal voltage :** 230/400 V ~  
**insulation voltage:** 500 V

### Options :

- Auxiliary :
  - to visualise the state ON or OFF of the circuit breaker,
  - to ON/OFF remotely the circuit breaker
- Locking mechanism
- Terminal covers and phase separators
- RCD add-on blocks
- Disassembly capability : Bistable DIN-rail latches (2 positions) upstream and downstream facilitate the assembly or the disassembling of the circuit breakers on the DIN-rail.

- Terminals with tightening compensation.

These circuit breakers are equipped with screw cages with tightening compensation, reinforcement cage, cable holding jaws. These elements contribute to an effective cable tightening over time.

- These circuit breakers are equipped with cable terminals of type “fast on” upstream and downstream to feed an auxiliary low voltage circuit (indicating lights, auxiliary control...) Max. circuit 6A 6 mm<sup>2</sup> maxi.

- Lockable handle  
MCB can be locked in “Off” position by the integrated locking facility on the handle. This lock allows to insert a 2.5-3.5mm plastic cable tie where you can fit a warning card if necessary and allows a safer working environment for all personnel.

- RCD Add-on blocks, simple, quick, adjustable and fixed

1. assembly
2. connection
3. locking

the assembly of the add-on block is carried out very quickly and easily. Simple and fast : it is a Hager innovation. add-on blocks 125A are available in fixed version and adjustable version.

Model	Icc/Curve	Accessories	Fast-on connection	Tightening comp. system	Lockable handle	Front product labelling
HLE / HLF	10kA / B, C	YES	NO	NO	NO	YES
HMB / HMC HMD	15kA / B, C, D	YES	YES	YES	YES	YES
HMK	30kA / C	YES	YES	YES	YES	YES
HMX	50kA / C	YES	YES	YES	YES	YES

# Miniature circuit breakers 80-125A HLE, HLF; "B"- "C" 10000- 10kA



Curves "B" and "C" 10000  
IEC 60898-1  
10 kA  
IEC 60947-2

Tripping curves :  
"B" magnetic setting between  
3 and 5 In  
"C" magnetic setting between  
5 and 10 In

Connection capacity :  
- 35mm<sup>2</sup> flexible wire  
(50mm<sup>2</sup> possible with some  
cable end-caps),  
- 70mm<sup>2</sup> rigid wire

In 80 to 125 A

Use :  
Residential, commercial and  
industrial premises

KEMA  
In conformity with the IEC  
60898-1, 947-2 approved

Designation	In / A	Width in ■ 17.5 mm	Cat. Ref. curve B	Cat. Ref. curve C
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HLF199S

Circuit breakers 1 pole 1 P.P. 	80	1.5	HLE180S	HLF180S
	100	1.5	HLE190S	HLF190S
	125	1.5	HLE199S	HLF199S



HLF299F

Circuit breakers 2 pole 2 P.P. 	80	3	HLE280S	HLF280S
	100	3	HLE290S	HLF290S
	125	3	HLE299S	HLF299S



HLF399S

Circuit breakers 3 pole 3 P.P. 	80	4.5	HLE380S	HLF380S
	100	4.5	HLE390S	HLF390S
	125	4.5	HLE399S	HLF399S



HLF499S

Circuit breakers 4 pole 4 P.P. 	80	6	HLE480S	HLF480S
	100	6	HLE490S	HLF490S
	125	6	HLE499S	HLF499S

# Miniature circuit breakers 80-125A

## HMB, HMC, HMD; "B", "C", "D" 15000 - 15kA



Curves "B" and "C" 15000  
IEC 60898-1  
15 kA  
IEC 60947-2

In 80 to 125 A

Tripping curves :  
"B" magnetic setting between  
3 and 5 I<sub>n</sub>  
"C" magnetic setting between  
5 and 10 I<sub>n</sub>  
"D" magnetic setting between  
10 and 20 I<sub>n</sub>

Connection capacity :  
- 35mm<sup>2</sup> flexible wire  
(50mm<sup>2</sup> possible with some  
cable end-caps)  
- 70mm<sup>2</sup> rigid wire  
**KEMA**  
In conformity with the IEC  
60898-1, 947-2 approved

Use :  
Residential, commercial and  
industrial premises

	Designation	In / A	Width in ■ 17.5 mm	Cat. Ref. curve B	Cat. Ref. curve C	Cat. Ref. curve D
 HMC199	Circuit breakers 1 pole 1 P.P.  	80	1.5	HMB180	HMC180	HMD180
		100	1.5	HMB190	HMC190	HMD190
		125	1.5	HMB199	HMC199	HMD199
		<hr/>				
 HMC299	Circuit breakers 2 pole 2 P.P.  	80	3	HMB280	HMC280	HMD280
		100	3	HMB290	HMC290	HMD290
		125	3	HMB299	HMC299	HMD299
		<hr/>				
 HMC399	Circuit breakers 3 pole 3 P.P.  	80	4.5	HMB380	HMC380	HMD380
		100	4.5	HMB390	HMC390	HMD390
		125	4.5	HMB399	HMC399	HMD399
		<hr/>				
 HMC499	Circuit breakers 4 pole 4 P.P.  	80	6	HMB480	HMC480	HMD480
		100	6	HMB490	HMC490	HMD490
		125	6	HMB499	HMC499	HMD499

# Miniature circuit breakers HMK; "C" - 30kA



Curve "C"  
30 kA

Voltage:  
230/400V - 50/60Hz

Connection capacity:  
- 35mm<sup>2</sup> flexible wire  
- 50mm<sup>2</sup> rigid wire

In 80 to 125A

Use:  
Commercial and industrial  
premises

In conformity with the  
IEC 60497-2

Magnetic setting between 5  
and 10 In

Designation	In/A	Width in I 17.5mm	Pack. qty.	Cat. Ref.
-------------	------	----------------------	---------------	-----------



HMK199

Circuit breakers 1 pole 1 P.P.	80	1.5	1	HMK180
	100	1.5	1	HMK190
	125	1.5	1	HMK199



HMK299

Circuit breakers 2 pole 2 P.P.	80	3	1	HMK280
	100	3	1	HMK290
	125	3	1	HMK299



HMK399

Circuit breakers 3 pole 3 P.P.	80	4.5	1	HMK380
	100	4.5	1	HMK390
	125	4.5	1	HMK399



HMK499

Circuit breakers 4 pole 4 P.P.	80	6	1	HMK480
	100	6	1	HMK490
	125	6	1	HMK499



Curve "C"  
50kA

Voltage:  
230/400V - 50/60Hz

Connection capacity:  
- 35mm<sup>2</sup> flexible wire  
- 50mm<sup>2</sup> rigid wire

In 10 to 63A

Use:  
commercial and industrial  
premises

In conformity with the  
IEC 60497-2

Magnetic setting between 5 and  
10 In

Designation	In/A	Width in I 17.5mm	Pack. qty.	Cat. Ref. C curve
 Circuit breakers 1 pole 1 P.P. 	10	1.5	1	HMX110
	16	1.5	1	HMX116
	20	1.5	1	HMX120
	25	1.5	1	HMX125
	32	1.5	1	HMX132
	40	1.5	1	HMX140
	50	1.5	1	HMX150
	63	1.5	1	HMX163

HMX120

 Circuit breakers 2 pole 2 P.P. 	10	3	1	HMX210
	16	3	1	HMX216
	20	3	1	HMX220
	25	3	1	HMX225
	32	3	1	HMX232
	40	3	1	HMX240
	50	3	1	HMX250
	63	3	1	HMX263

HMX225

 Circuit breakers 3 pole 3 P.P. 	10	4.5	1	HMX310
	16	4.5	1	HMX316
	20	4.5	1	HMX320
	25	4.5	1	HMX325
	32	4.5	1	HMX332
	40	4.5	1	HMX340
	50	4.5	1	HMX350
	63	4.5	1	HMX363

HMX320

 Circuit breakers 4 pole 4 P.P. 	10	6	1	HMX410
	16	6	1	HMX416
	20	6	1	HMX420
	25	6	1	HMX425
	32	6	1	HMX432
	40	6	1	HMX440
	50	6	1	HMX450
	63	6	1	HMX463

HMX440



MZN130



MZN131

Designation	Characteristics	Cat. Ref.
Terminal covers/ screw cap	Allows to cover connection terminals, screws of circuit breakers. The screw covers can be sealed	MZN130
Phase separator	1 set of 3 phase separators	MZN131

## Remote control auxiliary

These products are remote control auxiliaries for modular protection devices (MCB, RCCB, RCBO).

They allow:

- to operate by remote control the closing and opening contacts of the associated device (MCB, RCD and RCBO).
- to indicate the state of contacts and the tripping of the associated product.

The product MZ911, MZ912 has a further function which allows a second automatic tripping when fault current.

### Particular functioning modes

- power interruption:

When the power is interrupted, the product saves its state (time delays, handle position and number of trippings) in order to reset when the power supply returns.

During the interruptions the indicator light and the contacts "a" and "b" are open.

If a control disappears during an interruption, it is not executed when there is supply.

- soldered contacts on the associated product:  
In this case, the handle of the remote auxiliary positions itself in the centre as the handle of the associated device.

This state is indicated by:

- "a" and "b" contacts opening.
- the indicator light is intermittent red.

- forced remote closing:

When "on" or automatic reclosing are jammed, the controlled device has tripped 3 times or a time delay (3 mins or 30 secs) is present, it is possible to reactivate them.

To unjam "on" remotely, we must activate "reset" position (for 5 s) until a green indicator light appears.

To reinitialise the automatic resetting remotely, activate "reset" and then "on".

To reinitialise locally, hold the side selector.

- remote control impossible when tripping (overloads or short-circuits):

It is impossible to impose a manual setting after tripping. To reset, cable the contacts "a" and "b" in order and connect them on "reset" control (input 6).

### Connection capacity

- Up:  
Rigid conductor: 1.5 to 10<sup>□</sup>  
Flexible conductor: 1 to 6<sup>□</sup>
- Down:  
Rigid conductor: 2 to 2.5<sup>□</sup>  
Flexible conductor: 2 to 2.5<sup>□</sup>

Complies with EN 50-5557.



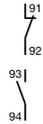
MZ912

Designation	Characteristics	Width in 17.5mm	Pack. qty.	Cat. Ref.
Auto reclosing remote control auxiliaries	for 1, 2, 3, 4 pole MCBs, RCBOs, RCCB, with or without add-on-block	3	1	MZ911
	for 1, 2, 3, 4 pole MCBs, RCBOs, RCCB, with or without add-on-block	3	1	MZ912

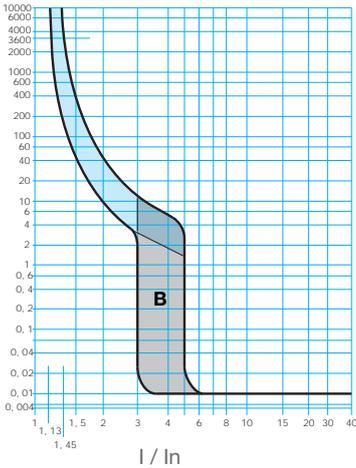
All auxiliaries are common to both single and multi-pole circuit breakers. These auxiliaries are fitted to the left hand side of devices.  
Fault indication, auxiliaries, shunt trips, and under-voltage releases are fitted with a flag indicator that indicates the automatic/remote tripping of the device.

Test mode for CZ001, MZ201, MZ202 : possible to test cabling of auxiliary circuits operation by tripping-over contacts manually. Resetting of contact occurs simultaneously with MCB/RCCB resetting.

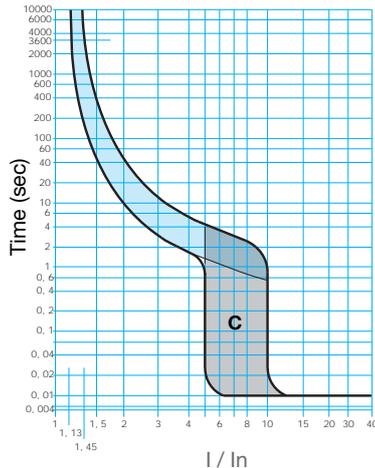
CZ001 must be fitted on the RCCB before fitting maximum one additional auxiliary (MZ203 to MZ206).  
Up to 4 auxiliaries can be fitted on MCB.

	Designation	Description	Width in 17.5mm	Pack qty.	Cat. Ref.
 MZ201	<b>Auxiliary + alarm switch</b>	1 module wide for ON/OFF & trip indication	1	1	CZ001
	<b>Auxiliary contacts</b> 6A - 230V~ 3A - 440V~ Allows remote indication of main contact status.	1NO + 1NC auxiliary contact	1/2	1	MZ201
					
 MZ204	<b>Signal contacts</b> 6A - 230V~ 3A - 440V~ Signal contact indicates a fault condition (e.g. MCB tripped on overload or short circuit). flag indicator red - MCB tripped	1NO + 1NC signal contact	1/2	1	MZ202
					
 MZ205	<b>Shunt trip</b> Allows remote tripping of the device	230 - 415 Vac 110 - 130 Vdc	1	1	MZ203
			24 - 48 Vac 12 - 48 Vdc	1	1
 MZ206	<b>Under voltage release</b> Allows MCB to be closed only when voltage is above 70% of Un. MCB will automatically trip when voltage falls by 35% of Un	48 Vdc 230 Vac	1 1	1 1	MZ205 MZ206
					
 MZ209	<b>Overvoltage auxiliary</b> Protects the installation from permanent overvoltage	230 Vac	1	1	MZ209
	<b>Combined Over &amp; Under-voltage auxiliary</b> Protects the installation from permanent over and under voltage	230 Vac	1	1	MZ214
 MZ214	<b>Locking kit</b> For the dolly of the device supplied without padlock.	This allows locking of the device dolly in the on/off position. will accept two padlocks with hasps of 4.75mm diameter max.		2	MZN175

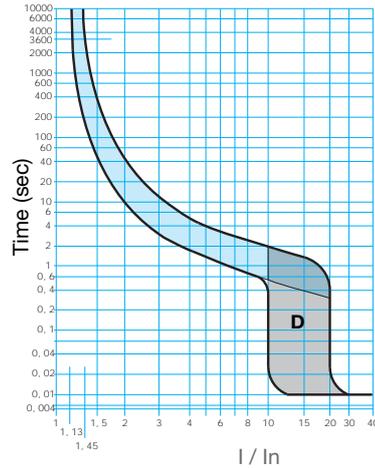
Type "B" curve



Type "C" curve



Type "D" curve



Electrical characteristics

MCB type	MY__E	MT__A	MU__A	NB__A	NC__A	NDN__A	NRN	HMX	HLE/F	HMB/C/D	HMK	
Current rating	1 - 63A	6 - 63A	2 - 63A	6 - 63A	0.5 - 63A	0.5 - 63A	6 - 63A	25 - 63A	80-125A	80-125A	80-125A	
Tripping curve												
B: 3 - 5In												
C: 5 - 10In	C	B	C	B	C	D	C	C	B / C	B / C / D	C	
D: 10 - 20In												
Breaking capacity												
EN 60 898 & IEC 898	4.5kA	6kA	6kA	10kA	10kA	10kA	-	-	10kA	15kA	-	
IEC 947 - 2	6kA	10kA	10kA	15kA	15kA	15kA	15/25kA	50kA	10kA	15kA	30kA	
NEMA AB - 1	10KAIC	22KAIC	22KAIC	30KAIC	30KAIC	30KAIC	30KAIC	-	-	-	-	
Rated voltage - 50/60Hz	230/400Vac (max. 440Vac)								240 / 415Vac			
Isolating voltage	500V											
Electrical endurance	0.5 to 32A		20 000 operations									
	40 to 125A		10 000 operations									
Working temperature	-5°C to +60°C											
Tropicalisation	Treatment 2 with relative humidity 95% at 55°C											

Correction factor

Depending on the model selected some of the breaker is calibrated at a temperature of 30°C in accordance to IEC 898. Temperature correction

In (A)	30°C	35°C	40°C	45°C	50°C	55°C	60°C
0.5	0.5	0.47	0.45	0.4	0.38	-	-
1	1	0.95	0.9	0.8	0.7	0.6	0.5
2	2	1.	1.7	1.6	1.5	1.4	1.3
3	3	2.8	2.	2.	2.	2.1	1.9
4	4	3.7	3.	3.3	3	2.8	2.5
6	6	5.6	5.3	5	4.6	4.2	3.8
10	10	9.4	8.8	8	7.5	7	6.4
16	16	15	14	13	12	11	10
20	20	18.5	17.5	16.5	15	14	13
25	25	23.5	22	20.5	19	17.5	16
32	32	30	28	26	24	22	20
40	40	37.5	35	33	30	28	25
50	50	47	44	41	38	35	32
63	63	59	55	51	48	44	40
80	80	77.6	75.1	72.6	70	67.2	64.4
100	100	96.6	93.1	89.4	85.6	81.6	77.5
125	125	121.9	118.9	115.7	112.4	109.1	105.6

Grouping factor (rated current reduce by factor K)

No. of units n	K
n = 1	1
2 ≤ n < 4	0.95
4 ≤ n < 6	0.90
6 ≤ n	0.85

Frequency

Thermal - Unchanged

Magnetic - Value multiplied by coefficient K

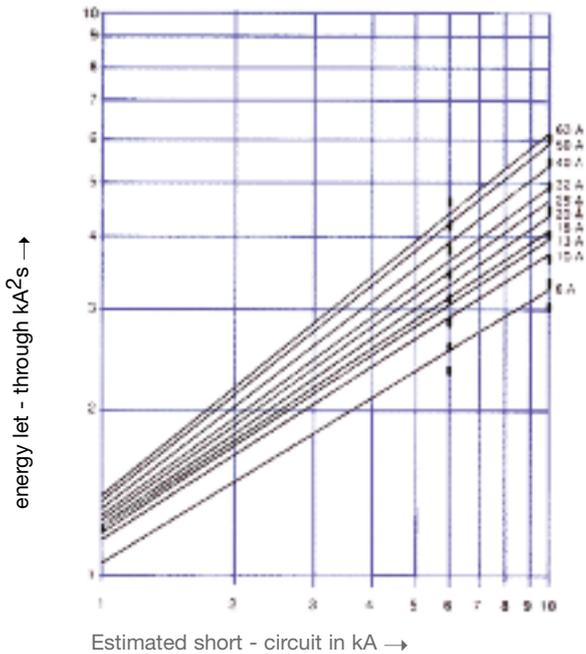
F (Hz)	17Hz - 60Hz	100Hz	200Hz	400Hz
K	1	1.1	1.2	1.5

Installation

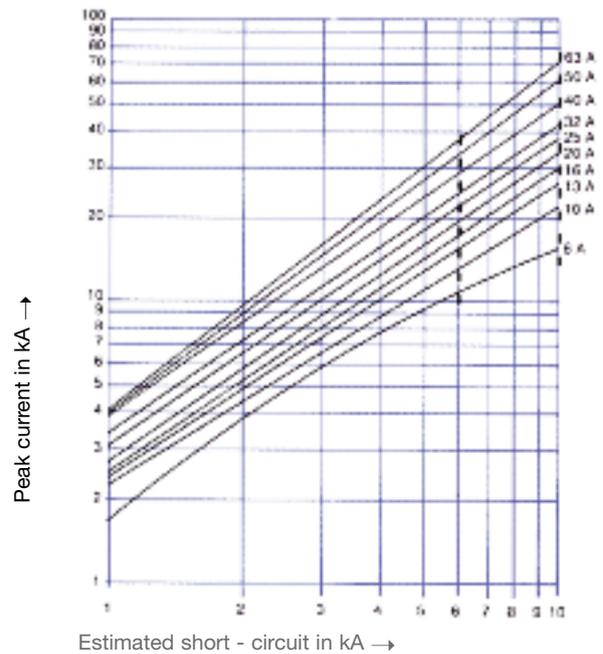
Working position : vertically, horizontally or flat.

Supply : feed from either top or bottom terminals.

$I^2T$  characteristics curve



Current limitation curve



**Power loss**

The power loss of MCB's is closely controlled by the standards and is calculated on the basis of the voltage drop across the main terminals measured at rated current. The power loss of Hager circuit breakers is very much lower than that required by the IEC Standard, so in consequences run cooler and are less affected when mounted together.

The table below gives the watts loss per pole at rated current.

MCB rated current (A)	0.5	1	2	3	4	6	10	16	20	25	32	40	50	63	80	100	125
Watt loss per pole (W)	1.3	1.5	1.7	2.1	2.4	2.7	1.8	2.6	2;8	3.3	3.9	4.3	4.8	5.2	5	5.5	8

**DC applications**

Because of their quick make and break design and excellent arc quenching capabilities Hager circuit breakers are suitable for use on DC. When selecting a circuit breaker for any DC application it is necessary to consider two main points.

**1. rated current**

The thermal time/current characteristics is unaffected so that the circuit breaker will carry its rated current and operate within its designated thermal time/current zone at 40°C Derating for higher ambient temperatures and grouping apply exactly the same as AC applications. The instantaneous magnetic trip is affected however, becoming less sensitive, requiring 2 times the AC operating current. The table below shows the upper and lower limits of both B and C instantaneous characteristic curves for 50Hz C and DC applications. Thermal unchanged. Magnetic trip increased as table below.

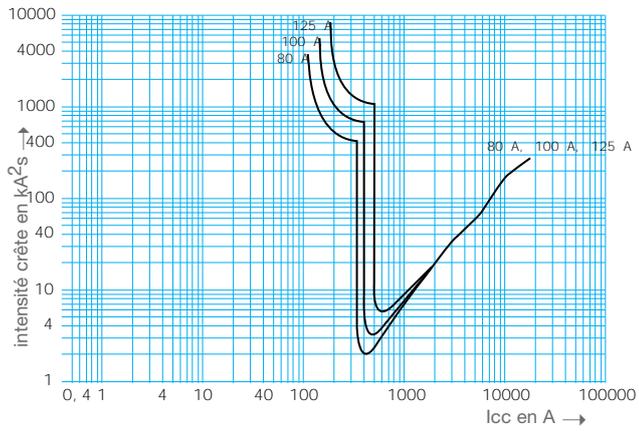
Characteristics curve	B		C	
	50Hz	DC	50Hz	DC
magnetic trip	3In	3In	5In	5In
I <sub>rm</sub> 1	3In	3In	5In	5In
I <sub>rm</sub> 2	5In	7.5In	10In	15In

**2. system voltage**

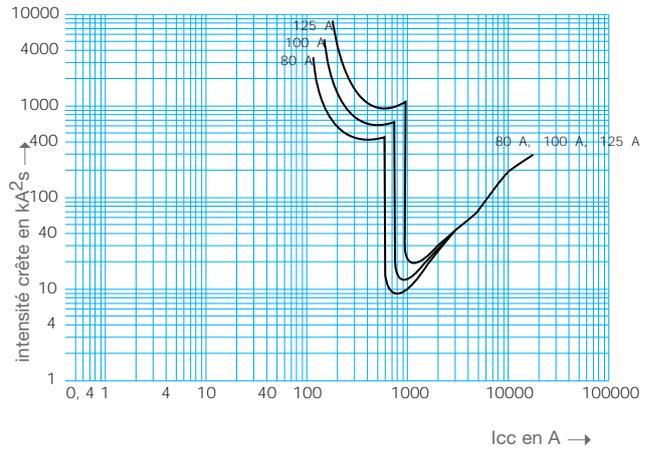
The system voltage and the type of system determines the number of poles required to provide the necessary breaking capacity and arc control. The table below gives the maximum DC voltage and breaking capacity for one pole or two poles connected in the series; The positioning of these breaking poles in the system depends on whether the system is earthed or insulated and if it is earthed whether one polarity is earthed or the centre point is earthed.

MCB	Breaking capacity		Magnetic 1 pole/60V	
	2 poles in	4 poles in series/125V	tripping series/250V	
MY	10kA	10kA	-	5 - 15In
MT	15kA	15kA	-	3 - 7.5In
MU	15kA	15kA	-	5 - 15In
NB	20kA	20kA	20kA	3 - 7.5In
NC	20kA	20kA	20kA	5 - 15In
ND	15kA	15kA	15kA	13 - 28In
NM	10kA	10kA	10kA	5 - 15In
NR	20kA	20kA	20kA	5 - 15In
HLE	10kA	10kA	10kA	3 - 7.5In
HLF	10kA	10kA	10kA	5 - 15In
HMB	15kA	15kA	15kA	3 - 7.5In
HMC	15kA	15kA	15kA	5 - 15In
HMD	15kA	15kA	15kA	13 - 28In

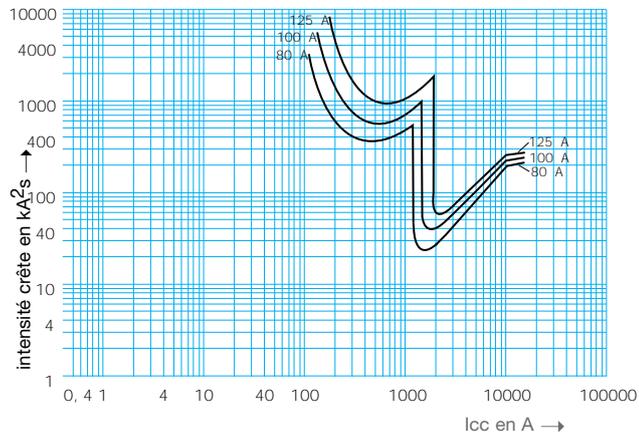
Current limiting at 400 V  
MCB's : HMB



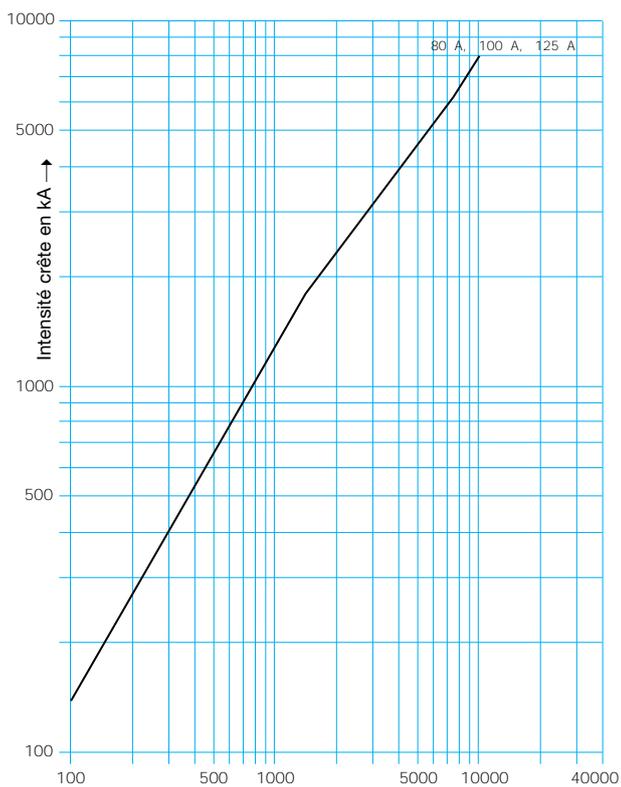
MCB's : HMC



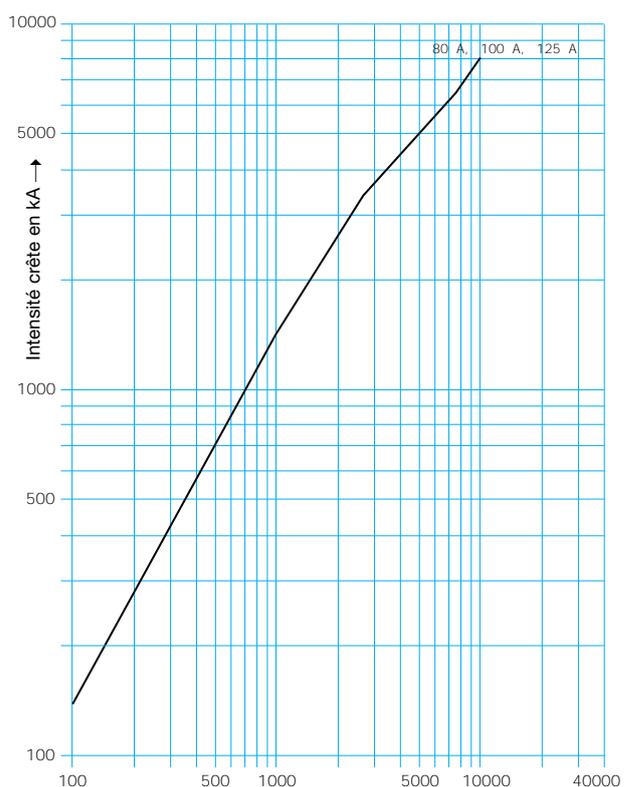
MCBs : HMC



Short circuit limiting at 400 V  
MCB's : HMB, HMC



MCB's : HMD



## MZ901 - MZ911 - Working principle

The position of front side selector ① defines the functioning modes of the products: “off & on” remote control, automatic reclosing “auto”, locking of the auxiliary “🔒”, resetting for the auxiliary “reset”.

### Remote control position of front side selector “off & on”

- The remote control “on”, “off”, “reset” and “🔒” are operational (input n°2 to n°8)
- Counting of contact openings on fault current:
  - 1 < number of tripping < 3, control “on” is operational after 3 min or 30s time delay side selector ③)
  - Number of trippings = 3, control “on” is locked. Unlocking possible with local selector or remote control “reset”.

### Automatic reclosing (only on MZ910) - position of front side selector “auto”

- The automatic reclosing is operational as well as the remote controls “on”, “off”, “reset” and “🔒” (input n°2 to n°8)
- Transient fault: if tripping occurs more than 2s after closing.
  - number of automatic reclosing and “on” control are unlimited. Automatic reclosing or control “on” are locked for 3 min or 30s (side selector ③ ) after each tripping.
- Permanent fault: if tripping occurs in 2s after closing, this fault is counted:
  - 1 < number of tripping < 3, automatic reclosing or control “on” is locked for 3 min or 30s (selector ③ ) after each tripping
  - number of tripping = 3, automatic reclosing and control “on” is locked. Unlocking possible with local selector or remote control “reset”.

**Resetting of the auxiliary - position of front side selector “reset”**  
This position locks all controls and automatic resetting. The auxiliary is initialized if the position is kept over 5s: time delays and number of tripping are reset.

**Locking of the auxiliary position of front side selector “🔒”**  
This position locks all controls and automatic reclosing.

For the functioning modes “off & on” and “auto”, the remote controls “on”, “off”, “reset” and “🔒” are operational (input n°2 to n°8).

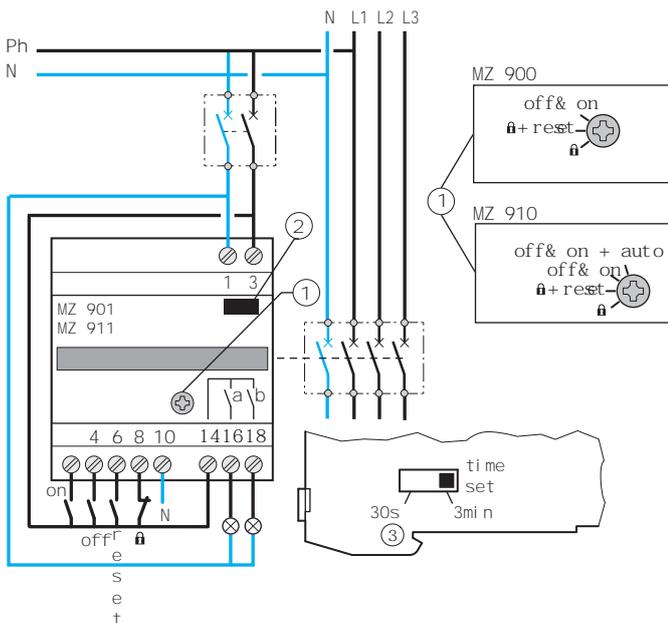
These controls can be made by a contact such as pushbutton or closing switch (e.g. automation, supervisor, clocks, etc...)

**“on” (input n°2) and “of” (input n°4) remote controls**  
“Off” has priority with regard to the “on” and the automatic reclosing.

**“reset” (input n°6) remote control**  
This control initializes the product mainly the number of tripping and the time delay (3 min or 30sec) and padlocks “on” and automatic reclosing.

**“🔒” (input n°8) remote control**  
This control locks “on” and automatic reclosing. The “off” is available.

## Connection diagram



## Supervision

“a” and “b” signal outputs indicate the position of the handle of the associated product or the states of the remote control auxiliary.

a	b	
		Controlled device ON
		Controlled device OFF
		Tripped or end of cycle (tripped 3x)
		Padlocking or reset (by remote control on position of selector) / Controlled device out of order

The indicator light ② indicates the state of product and allows a diagnosis.

**Position of “time set” side selector ③**  
Time delay 3 min before remote control “on” or automatic reclosing is recommended for the associated products. For specific installations, when continuity of service is required, side selector can be set on 30s except for MCBs and RCBOs.

### Functions

Tripping and indication auxiliary contacts are common to the range of Hager MCBs and RCCBs. They should be mounted on the left hand side of the device.

#### Auxiliary contact MZ201

Allows remote indication of the status of the device contacts to which it is associated.

#### Alarm contact MZ202

The alarm or signal contact will provide indication if the breaker trips under fault conditions

#### Note

Default indication auxiliaries and shunt trips or under voltage releases are fitted with tripping indications and reset facility.

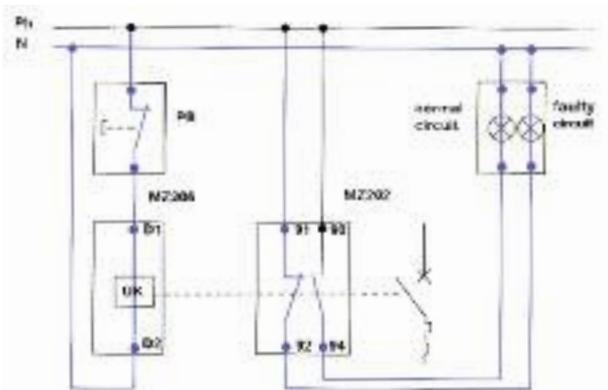
#### MZN203 / MZN204 shunt trip

Allows tripping of the device by feeding the coil. It is fitted with internal contacts which allow it to be fed by an impulse or latched feed. The contacts also allow for remote indication of operation.

#### MZN205 / MZN206 under voltage release

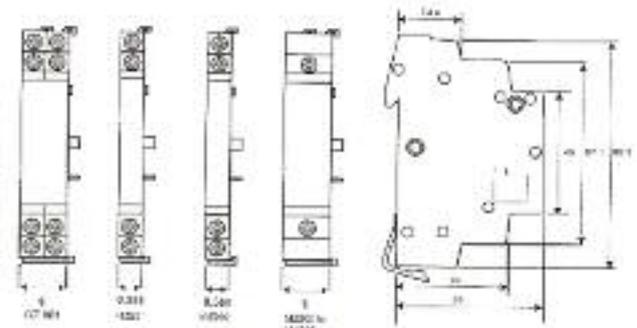
Allows the MCB to trip when the voltage drops or by pressing a remote off switch (ie emergency stop).

### Emergency switch - off with under voltage release



Note : control circuit must be protected using a maximum 6A curve C MCB.

### Sizes

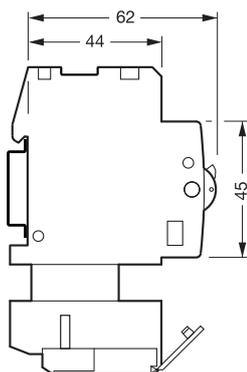


### Recapitulative table

	MZ201	MZ202	CZ001	MZ203	MZ204	MZ205	MZ206
	1O + 1C	1O + 1C	2X				
	230V~ 6A	230V~ 6A	1O + 1C				
	440V~ 3A	440V~ 3A	230V~ 6A				
			400V~ 3A	230 to 415V~	24 to 48V~	48V	230V~
				110 to 130V=	12 to 48V=		
				50Hz	50Hz	50Hz	50Hz

### Grouping / combination of several auxiliaries

On 2, 3 and 4 pole MCBs it is possible to associate 3 auxiliaries - 2 indication auxiliaries and 1 release auxiliary. In this case, it is important to first fix the indication auxiliary (MZ 201 and MZ 202) and then the release auxiliary (MZ 203/204 and MZ 205/206)



**Description**  
RCD add-on blocks for use with MCB ranges MY, MT, MU, NB, NC, ND, NR up to 63A.

**Technical data :**  
High sensitivity :  
10-30 mA instant tripping  
Medium sensitivity :  
100-500 mA instant tripping  
300 - 500mA selective (time delay)

These devices are designed to be fitted on the right hand side of the 2, 3 and 4 poles MCB's.

The combination device then provides protection against overload, short circuits and earth leakage faults.

All devices have a test facility  
All devices except 10mA and 100mA, are type AC.  
10mA and 100mA are type A.  
All devices are protected against nuisance tripping and transient voltages

Nominal voltage :  
2 poles 230V  
3 and 4 poles : 230/400V

Comply with IEC1009

**Connection capacities :**  
25 A : 6□ flexible cable  
10□ rigid cable  
40, 63 A : 16□ flexible cable  
25□ rigid cable

Designation	Type	Sensitivity IΔn	In/A	Width in 17.5mm	Pack qty.	Cat. Ref.	
<b>2 poles add-on blocks</b>							
	A	10 mA	25A	2	1	BC225N	
	AC	30 mA	25A	2	1	BD226N	
	AC		40A	2	1	BD241N	
	AC		63A	2	1	BD264N	
	A	100 mA	25A	2	1	BE225N	
	A		63A	2	1	BE263N	
	AC	300 mA	25A	2	1	BF226N	
	AC		40A	2	1	BF241N	
	AC		63A	2	1	BF264N	
	AC	500 mA	63A	2	1	BG264N	
	AC		300 mA	63A	2	1	BP264N
	AC		500mA	63A	2	1	BR264N

<b>3 poles add-on blocks</b>							
	AC	30 mA	25A	2	1	BD326N	
	AC		40A	3	1	BD341N	
	AC		63A	3	1	BD364N	
	A	100 mA	25A	3	1	BE325N	
	A		63A	3	1	BE363N	
	AC	300 mA	25A	2	1	BF326N	
	AC		40A	3	1	BF341N	
	AC		63A	3	1	BF364N	
	AC	500 mA	63A	3	1	BG364N	
	AC		300 mA	63A	3	1	BP364N
	AC		500 mA	63A	3	1	BR364N

<b>4 poles add-on blocks</b>							
	AC	30 mA	25A	2	1	BD426N	
	AC		40A	3	1	BD441N	
	AC		63A	3	1	BD464N	
	A	100mA	25A	3	1	BE425N	
	A		63A	3	1	BE463N	
	AC	300 mA	25A	2	1	BF426N	
	AC		40A	3	1	BF441N	
	AC		63A	3	1	BF464N	
	AC	500 mA	63A	3	1	BG464N	
	AC		300 mA	63A	3	1	BP464N
	AC		500 mA	63A	3	1	BR464N

BD226N

BD364N

BD426N

# RCD add-on blocks type AC , type A and HI for circuit breakers HLE, HLF, HMB, HMC, HMD, HMK, HMX



**RCD add-on blocks for circuit Breakers HMB, HMC, HMD, HLE, HLF, HMK, HMX.**

**Fixed :**

- high sensitivity 30 mA instantaneous
- average sensitivity 300 mA - instantaneous.

**Settings :**

- sensitivity  $I\Delta n$  0.3 - 0.5 - 1 A ...
- delay  $\Delta t$  0  - 60 - 150 ms.

These devices are intended to be fixed on the right side of the circuit breakers to form differential circuit breakers from 80 to 125A, two, three or four-pole.

This "circuit breaker + block" ensures, in addition to the overload and short circuit protection, the protection of the installations against the insulation defects (300mA and 1A) and the protection of the people against the direct contacts (30mA) and indirect (300mA).

**Adjustable blocks :**

The setting is done by actuating the thumbwheel in front face. The setting thumbwheels are protected by a transparent sealable cover.

**Dissassembly :**

The bistable latch (2 positions) facilitate the assembly or disassembly by the bottom of the "circuit breaker + block."

These RCD add-on blocks exist in version AC and in version A-HI.

**Version AC **

The add-on blocks are protected against unexpected tripping caused by the transitory leakage currents : lightning, capacitive loading.

**Version A HI :**

Type A  : when the electrical load is likely to produce fault component dc pulsating current, the protection of the people must be carried out by differentials of type A.

**HI (High Immunity) :**

The products with "reinforced immunity" reduce the unexpected tripping when they protect equipment generating disturbances (micro-processing, electronic ballast,...)

The differential defect or earth fault is visualized by the rearment handle of the block in low position (yellow colour). Test button for differential functioning check.

**Tightening compensation cages**

These circuits breakers blocs are equipped with screw cages with tightening compensation, reinforcement arch, cable holding jaws. These elements contribute to an effective tightening over time.

**Connection capacity :**

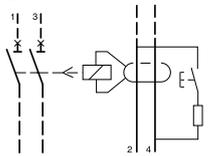
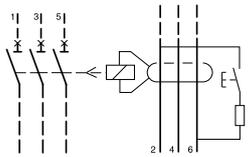
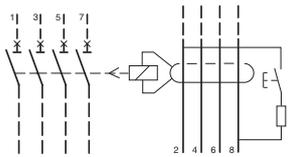
- 35mm<sup>2</sup> flexible connection (50mm<sup>2</sup> possible with some terminals),
- 70mm<sup>2</sup> rigid connection.

Assembly and disassembly facilitated by the drawer assembly system. The terminal cover is dependent of the add-on block. It is provided with jeying systems avoiding the omission of terminal tightening downstream of the circuit breaker. .

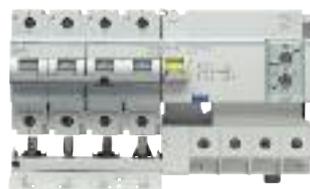
Nominal voltage: -15 +10 %  
2 poles: 230 V  
Three and four-pole: 230/400 V  
Test button: 230/400 V.

In conformity with the requirements of the appendix G of the IEC 61009-1.

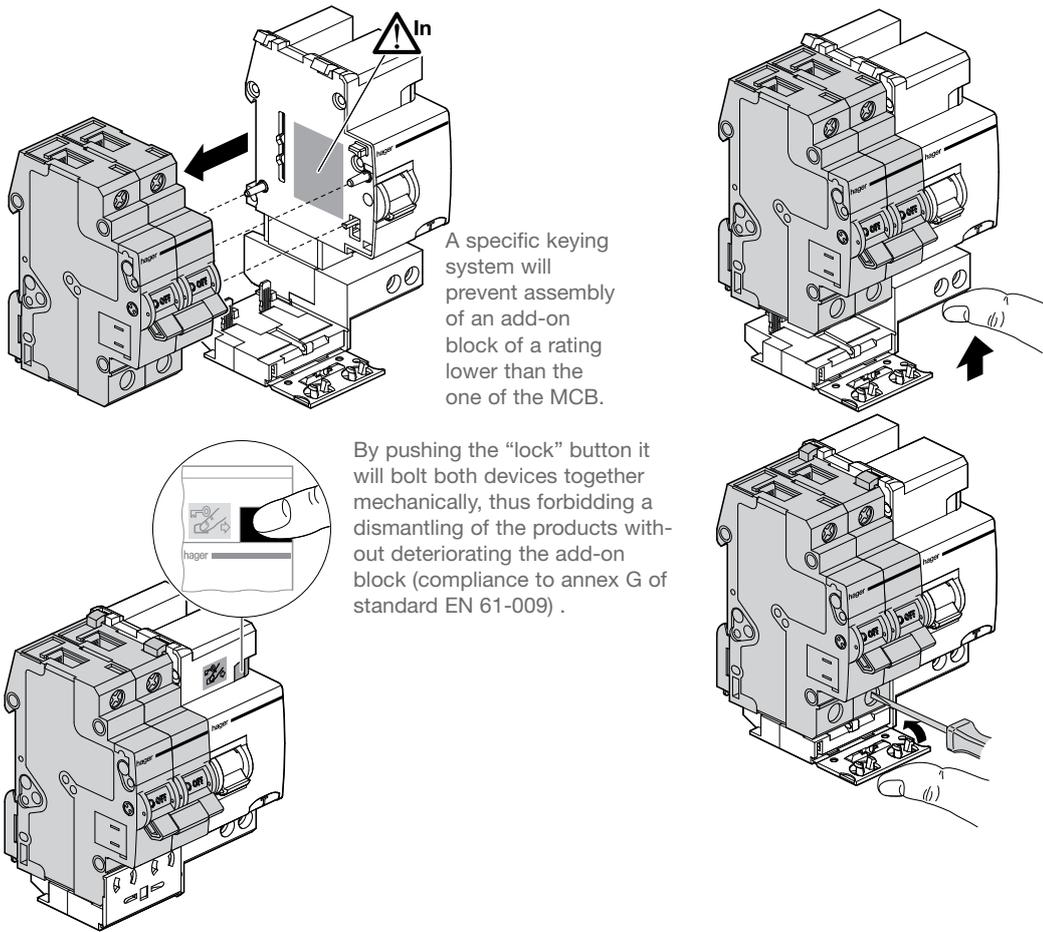
In conformity with the requirements of standard IEC 60947-2.

Designation	Sensitivity fixed / adjustable $I\Delta n$	In / A	Width in  17.5 mm	Cat. Ref add-on blocks AC	Cat. Ref add-on blocks A-HI
 <b>Add-on blocks 2 poles 2 P.P.</b> 	Fixed 30 mA	125	6	BDC280E	BDH280E
	Adjustable 0.3 - 0.5 - 1 A 0 -  60 - 150	125	6	BTC280E	BTH280E
 <b>Add-on blocks 4 poles 3 P.P.</b> 	Fixed 30 mA	125	6	BDC380E	BDH380E
	Adjustable 0.3 - 0.5 - 1 A 0 -  60 - 150 ms	125	6	BTC380E	BTH380E
 <b>Add-on blocks 4 poles 4 P.P.</b> 	Fixed 30 mA	125	6	BDC480E	BDH480E
	Fixed 300 mA	125	6	BFC480E	BFH480E
	Adjustable 0.3 - 0.5 - 1 A 0 -  60 - 150 ms	125	6	BTC480E	BTH480E

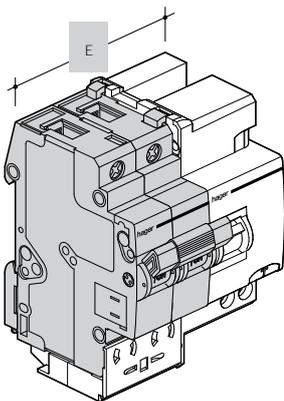
**Association circuit breaker + add-on block 4 poles adjustable**



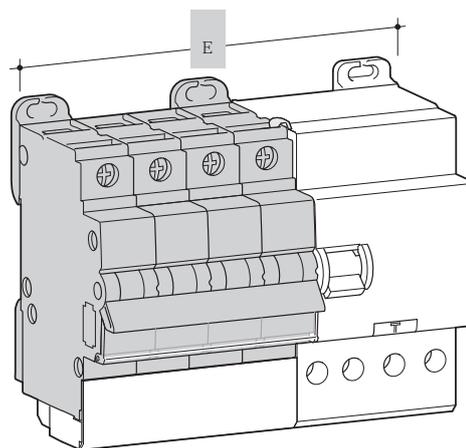
## Assembly of the add-on blocks ≤ 63 A and 80-125A



## Dimensions of associated MCB / add-on block



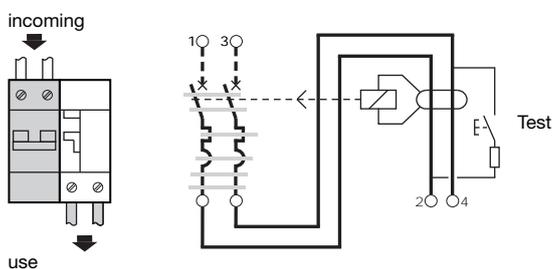
add-on blocks 25, 40, 63, 80, 100 and 125A



	E
2 P.P. 6 to 63 A	4 ■
2 P.P. HM 80 to 125 A	9 ■
3 P.P. 6 to 25 A	5 ■
3 P.P. 32 to 63 A	6 ■
3 P.P. HM 80 to 125 A	10.5 ■
4 P.P. 6 to 25 A	6 ■
4 P.P. 32 to 63 A	7 ■
4 P.P. 6 to 63 A *	7 ■
4 P.P. HM 80 to 125 A	12 ■

\* 4 pole add-on blocks two output

## Wiring diagram for MCB+Add-on block from 25 to 125A



### Connection capacities :

for assembled products from 6 to 25A : 6 mm<sup>2</sup> / 10 mm<sup>2</sup>  
 for assembled products from 32 to 63 A : 10 mm<sup>2</sup> / 25 mm<sup>2</sup>  
 for assembled products from 80 to 125A : 35 mm<sup>2</sup> / 70 mm<sup>2</sup>

If the supply of the add-on block is done from the bottom it should be clearly indicated.

**Description**

To open a circuit automatically in the case of an earth leakage fault between phase and earth and / or neutral greater or equal to 10, 30, 100, 300 or 500mA; use in domestic, commercial and industrial installations.

**Technical data**

Nominal voltage :  
 2 pole 127/230V - 50Hz  
 4 pole 230/400V - 50Hz  
 specifications : IEC 61008-1 SS97

**Connection capacity :**

16-63A rigid 25mm<sup>2</sup>  
 flexible 16mm<sup>2</sup>  
 80-100A rigid 50mm<sup>2</sup>  
 flexible 35mm<sup>2</sup>

Ambient temperature range :  
 -5 to + 40°C

**Positive contact indication :**

Mechanical indicator, appearing on the front face of the RCCB, linked to the contacts shows the positive opening of all poles, red = contacts closed  
 green = contacts open

**Earth fault indicator**

Mechanical indicator appearing on the front face of the RCCB to differentiate between tripping and off position  
 yellow - tripped

**Nuisance tripping**

All the RCCBs are protected against transient voltages (lightning, line disturbances) and transient currents (from high capacitive circuits). DC sensitive RCCBs or time delay devices are available, please consult us. You also have the possibility to install the following accessories :  
 electrical auxiliaries  
 terminal cover kit  
 locking kit



CD240B



CD440B

	Sensitivity IDn	Current	Pack qty.	Cat.Ref. 2 poles	Pack qty.	Cat. Ref. 4 poles
High sensitivity	10mA	16A	1	CC216B	-	-
		25A	1	CC225B	-	-
	30mA	16A	1	CD216B		
		25A	1	CD225B	1	CD425B
		40A	1	CD240B	1	CD440B
		63A	1	CD263B	1	CD463B
Medium sensitivity	100mA	80A	1	CD280B	1	CD482B
		100A	1	CD284B	1	CD485B
Medium sensitivity	100mA	25A	1	CE225B	1	CE425B
		40A	1	CE240B	1	CE440B
		63A	1	CE263B	1	CE436B
		80A	1	CE280B	1	CE480B
		100A	1	CE284B	1	CE484B
Low sensitivity	300mA	25A	1	CF225B	1	CF425B
		40A	1	CF240B	1	CF440B
		63A	1	CF263B	1	CF463B
		80A	1	CF280B	1	CF480B
		100A	1	CF284B	1	CF484B
Low sensitivity	500mA	25A	1	CG225B	1	CG425B
		40A	1	CG240B	1	CG440B
		63A	1	CG263B	1	CG463B
		80A	1	CG280B	1	CG480B
		100A	1	CG284B	1	CG484B
Terminal cover kit (1 set = 2 covers)	for RCCBs 2I	16 to 63A	10 sets	CZN005		
	for RCCBs 4I	16 to 63A	10 sets	CZN006		
	for RCCBs 2I	80 to 100A	10 sets	CZ007		
	for RCCBs 4I	80 to 100A	10 sets	CZ008		

Locking kit :

MZN175

The selective Residual Current Circuit Breakers are available with 100, 300 mA sensitivity in 2 and 4 pole version.

A selective RCCBs is time delayed ( min. 300ms at  $I_{\Delta n}$ ). And it is commonly used as a main breaker to prevent nuisance tripping due to transient overvoltages and provide discrimination with the downstream standard RCCBs.

**Technical data**  
nominal voltage :  
2-pole 127-230V  
4-pole 230-400V

Surge current withstand(8/20 $\mu$ s):  
Standard : 250A  
Selective : 3kA  
Type AC

Positive contact indication :  
Red : contacts closed  
Green : contacts open

Earth fault indicator :  
Breaker tripping due to earth fault shown by yellow window

Transient protected :  
Protected against nuisance tripping

Standard : IEC 61008-1,

Type	In (A)	Mod.	Cat. ref. 100mA	Cat. Ref. 300mA
2-pole Selective	40A	2	CN240B	-
	40A	4	CN440B	CP440B
	63A 80A	4 4	CN463B CN480B	CP463B CP480M
Alarm and auxiliary contact Auxiliary contact for remote indication of breaker position, and alarm contact for remote fault indication.	5A/230V	1	CZ001	CZ001
Terminal cover kit for RCCBs 2I (1 set = 2 covers)	for RCCBs 2I 16 to 63A for RCCBs 4I 16 to 63A	10 sets 10 sets	- -	CZN005 CZN006



CN240B



CN463B

## RCCBs - HI (High Immunity) series type A

Sensitivity (mA)	Pole	Current (A)	Pack qty.	Cat. Ref.
30mA	2	25	6	CH225J
	4	40	6	CH440J
300mA	2	40	6	CQ240J
	2	63	6	CQ263J
	4	40	3	CQ440J
	4	63	3	CQ463J
Auxiliary & fault contacts			1	CZ001



CH225J



CQ463J

**Description**

Compact protection devices which provide MCB overcurrent protection and RCCB earth leakage protection in a single unit.

**Specification**

IEC 61009-1

Protected against transient voltages (lightning, line disturbances,...) and transient currents (from high capacitive circuits)

Technical data :

The units are available with current ratings of 6A, 10A, 16A, 20A, 25A, 32A and 40A. The device switches both the phase and neutral conductors. All ratings have 10mA, 30mA, 100mA or 300mA earth leakage protection. The units feature indicators which show whether tripping is due to an overcurrent or earth leakage fault.

Voltage rating - 127-230V

Current rating - 6-40A.

**Mechanical life :**

2 000 operations  
6kA for 6-40A  
10kA IEC947-2

Type AC

**Connection capacity**

Rigid conductor 25mm<sup>2</sup>  
Flexible conductor 16mm<sup>2</sup>

Designation	Sensitivity IDn	In/A	Breaking capacity	Width in 17.5mm	Pack qty.	Cat. Ref. type B	Cat. Ref. type C	
RCBO 1P+N	10mA	16	6kA	2	1	AC916B	AC966B	
		30mA	6		2	1	AD906B	AD956B
			10		2	1	AD910B	AD960B
			16		2	1	AD916B	AD966B
			20		2	1	AD920B	AD970B
			25		2	1	AD925B	AD975B
			32		2	1	AD932B	AD982B
	40		2	1	AD940B	AD990B		
	100mA	6		2	1		AE956B	
		10		2	1		AE960B	
		16		2	1		AE966B	
		20		2	1		AE970B	
		25		2	1		AE975B	
		32		2	1		AE982B	
		40		2	1		AE990B	
	300mA	6		2	1		AF956B	
		10		2	1		AF960B	
		16		2	1		AF966B	
		20		2	1		AF970B	
		25		2	1		AF975B	
		32		2	1		AF982B	
40			2	1		AF990B		



AD916B

Grey terminal cover

AZ002

**Description**

Compact protection devices which provide MCB overcurrent protection and RCCB earth leakage protection in a single unit.

**Specification**

IEC 61009-1

Protected against transient voltages (lightning, line disturbances,...) and transient currents (from high capacitive circuits) 

**Technical data :**

The units are available with current ratings of 6A, 10A, 16A, 20A, 25A, 32A and 40A. The device switches both the phase and neutral conductors. All ratings have 10mA, 30mA, 100mA or 300mA earth leakage protection. The units feature indicators which show whether tripping is due to an overcurrent or earth leakage fault.

Voltage rating - 127-230V

Current rating - 6-40A.

**Mechanical life :**

2000 operations  
10kA IEC61009-1

Type AC

**Connection capacity**

Rigid conductor 25mm<sup>2</sup>  
Flexible conductor 16mm<sup>2</sup>

Designation	Sensitivity IDn	In/A	Breaking capacity	Width in 17.5mm	Pack qty.	Cat. Ref. type B	Cat. Ref. type C
RCBO 1P+N	10mA	6	10kA	2	1	AC506B	AC556B
		10		2	1	AC510B	AC560B
		16		2	1	AC516B	AC566B
	30mA	6		2	1	AD506B	AD556B
		10		2	1	AD510B	AD560B
		16		2	1	AD516B	AD566B
		20		2	1	AD520B	AD570B
		25		2	1	AD525B	AD575B
		32		2	1	AD532B	AD582B
	100mA	6		2	1	AE506B	AE556B
		10		2	1	AE510B	AE560B
		16		2	1	AE516B	AE566B
		20		2	1	AE520B	AE570B
		25		2	1	AE525B	AE575B
		32		2	1	AE532B	AE582B
	300mA	6		2	1	AF506B	AF556B
		10		2	1	AF510B	AF560B
		16		2	1	AF516B	AF566B
20			2	1	AF520B	AF570B	
25			2	1	AF525B	AF575B	
32			2	1	AF532B	AF582B	



AD582B

Grey terminal cover

AZ002

**Description**  
Compact one module protection devices which combine the overcurrent functions of an MCB with the earth fault functions of an RCD. A range of sensitivity and current ratings are available for use in commercial and industrial applications

**Technical data**  
Specification complies with BSEN61009, IEC1009

**Sensitivity (fixed)**  
10 - 30 - 100 - 300 mA

**Terminal capacities :**  
1 module type - 16mm<sup>2</sup> rigid  
10mm<sup>2</sup> flexible

**Operation temperature :**  
-25°C to +55°C

**Features**  
1 module devices provide a compact solution for installation in consumer units, Invicta TP+N distribution boards, and din rail enclosures. These devices are 1P & solid neutral.

**Operating voltage**  
110 - 230 V AC

Flying neutral lead length 700m



AD110

Sensitivity IΔn mA	Breaking capacity	In/A	Width in I 17.5mm	Pack qty.	Cat. Ref. type B	Cat. Ref. type C
10mA	6kA	16A	1	1	AC107	AC122
		6A	1	1	AD104	AD119
		10A	1	1	AD105	AD120
		16A	1	1	AD107	AD122
		20A	1	1	AD108	AD123
		25A	1	1	AD109	AD124
		32A	1	1	AD110	AD125
		40A	1	1	AD111	AD126
		45A	1	1	AD112	AD127
		50A	1	1	AD113	AD128
100mA	6kA	6A	1	1		AE106Z
		10A	1	1		AE110Z
		16A	1	1		AE116Z
		20A	1	1		AE120Z
		25A	1	1		AE125Z
		32A	1	1		AE132Z
		40A	1	1		AE140Z
		45A	1	1		AE145Z
		50A	1	1		AE150Z
		300mA	6kA	20A	1	1
25A	1			1		AF125Z
32A	1			1		AF132Z
40A	1			1		AF140Z
30mA	10kA	6A	1	1		AD184
		10A	1	1		AD185
		16A	1	1		AD187
		20A	1	1		AD188
		25A	1	1		AD189
		32A	1	1		AD190
40A	1	1		AD191		

## Residual current devices

A residual current device (RCD) is the generic term for a device which monitors the current in the line conductor and the neutral conductor of a circuit in an earthed system.

The drawing opposite shows how a toroid is located around the line and neutral conductors to measure the magnetic fields created by the current flowing in these conductors. The sum of the magnetic fields set up by these currents (which takes into consideration both the magnetic and phase relationship of the currents) is detected by the toroid.

In a normal healthy circuit the vector sum of the current values added together will be zero. Current flowing to earth, due to a line earth fault, will return via the earth conductor, and regardless of load conditions will register as a fault. This current flow will give rise to a residual current ( $I_{res}$ ) which will be detected by the device.

It is most important that the line and neutral conductors are passed through the toroid. A common cause of nuisance operation is the failure to connect the neutral through the device.

RCCBs work just as well on three phase or three phase and neutral circuits, but when the neutral is distributed it must pass through the toroid.

RCCB are not suitable for use on DC systems and unearthed networks.

## RCCBs - domestic installation

RCCBs can be installed in two ways :

1. whole house protection
2. selective protection

Whole house protection is provided typically by a consumer unit where the RCCB device serves as the main switch. Although very popular this suffers from a disadvantage : all circuits are disconnected in the event of fault. Selective protection can be provided by associating the RCCB with identified high risk circuits by adopting one or more of the following :

### Split busbar consumer unit

All circuits are fed via an overall isolator and selected circuits fed additionally via the RCCB. Typical circuits fed direct are lighting, freezer, storage heating ; and circuits fed via the RCCB are socket outlets, garage circuits. This concept minimises inconvenience in the event of fault.

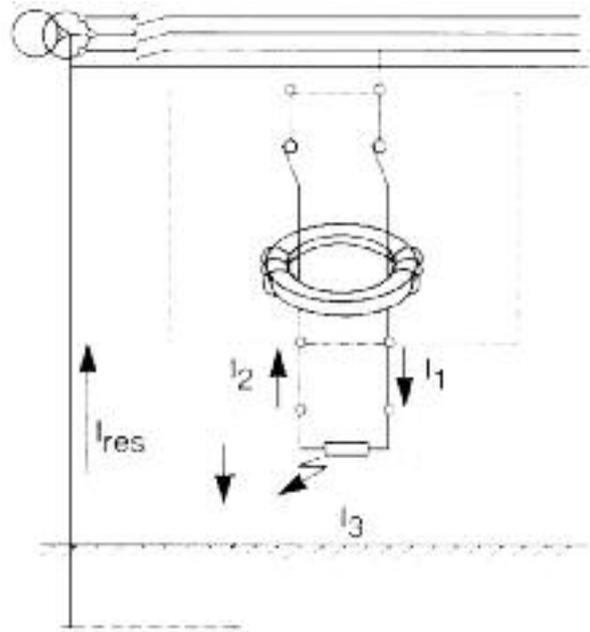
### Whole ring circuit

A 30mA device adjacent to the consumer unit, which provides protection for the downstairs ring circuit, provides an easy installation with protection for all associated socket outlets. This represents the best solution for upgrading existing installations.

### Nuisance tripping

All Hager RCCBs incorporate a filtering device preventing the risk of nuisance tripping due to transient voltages (lightning, line disturbances on other equipment...) and transient currents (from high capacitive circuit).

Check for the symbol :



## Pulsating DC fault current sensitive

Increasingly, semi-conductors are also extensively used in computers, VDUs, printers, plotters,... all of which may be fed from the main electrical supply. The presence of semi-conductors may result in the normal sinusoidal AC waveform being modified. For example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped. The resulting waveforms are said to have a pulsating DC component.

In the event of an earth fault occurring in equipment containing semiconductor devices, there is a probability that the earth fault current will contain a pulsating DC component.

Standard types of RCCB may not respond to this type of earth fault current and the intended degree of protection will not be provided.

Check for symbol :

Hager provide a range of pulsating d.c. sensitive devices for this type of application.

## Tripping characteristics

Type	$I_n$ (A)	$I_{\Delta n}$ (A)	Standard values of break time(s) and non-actuating time(s) at a residual current (I) equal to :					
			$0.5I_{\Delta n}$	$I_{\Delta n}$	$2I_{\Delta n}$	$5I_{\Delta n}$	500A	
general	any value	$\leq 0.03$	no trip	0.1s	0.1s	0.04s	0.04s	max. break times
		$> 0.03$	no trip	0.3s	0.15s	0.04s	0.04s	max. break times

Protection against shock outside the equipotential bonding zone

Bonding conductors are used in an installation to maintain metallic parts, as near as possible, to the same potential as earth. Working with portable equipment outside this equipotential bonding zone, e.g. in the car park of a factory, introduces additional shock hazards. Socket outlets rated 32A or less 'which may be reasonably expected to supply portable equipment for use outdoors' should have at least one socket nominated for outdoor use. This socket should be equipped with RCC protection unless fed from an isolating transformer or similar device, or fed from a reduced voltage.

Protection in special situations (IEE wiring regulation)  
The use of RCCBs is obligatory or recommended in the following situations :

- Caravans : 30mA RCCBs should be used
- TT systems
- Swimming pools : 30mA RCCB for socket outlets in zone B obligatory; recommended in zone C.
- Agricultural and horticultural : 30mA RCCB for socket outlets and for the purpose of protection against fire, RCCB 0.5A sensitivity.
- Construction sites : 30mA RCCB recommended

Portable equipment

With the exception mentioned above, where a socket is specifically designated for work outside the equipotential bonding zone, the Wiring Regulations demand the use of RCCBs to protect the users of portable equipment. It is widely recognised that their use has made a significant contribution to safety in the workplace and the home.

Protection against fire hazards

The provisions in the Wiring Regulations for protection against shock by indirect contact ensure rapid disconnection under earth fault assuming the fault has negligible impedance. Under such conditions the fault current, as we have seen, is sufficiently great to cause the overcurrent protection device to quickly disconnect the fault. However high impedance faults can arise where the fault current is sufficient to cause considerable local heat without being high enough to cause tripping of the overcurrent protective device. The heat generated at the point of the fault may initiate a fire long before the fault has deteriorated into a low impedance connection to earth.

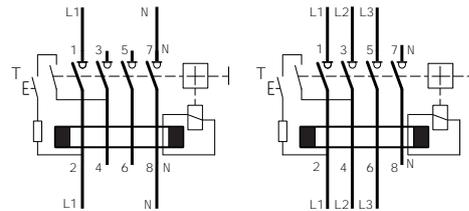
The provision of residual current protection throughout a system or in vulnerable parts of a system will greatly reduce the hazard of fire caused by such faults.

PEN conductors

The use of RCCBs in PEN conductors is prohibited. A PEN conductor is a single conductor combining the functions of neutral conductor and protective conductor. This being so, when the PEN conductor is taken through the torroid of an RCCB, earth faults will go undetected because the return path for the earth fault current is included in the residual sum.

Use of Hager RCCBs on 3 phase 3 wire systems

The Hager range of 4 pole RCCBs can be used to provide residual current protection of 3 phase, 3 wire circuits (no neutral).

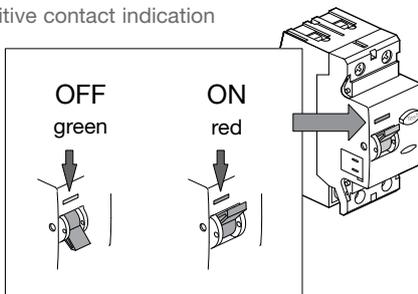


Supply entry  
Top or bottom feed.

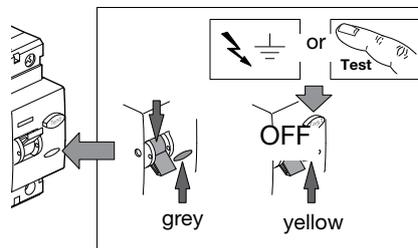
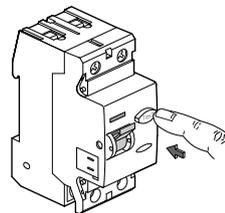
RCCBs /MCBs co-ordination

RCCBs	with MCBs				
	MY	MT/MU	NB	NC	ND
	1-63A	2-63A	6-100A	0.5-100A	6-63A
	C	B/C	B	C	D
<b>2 poles</b>					
16A	4.5kA	6kA	10kA	10kA	6kA
25A	4.5kA	6kA	10kA	10kA	6kA
40A	4.5kA	6kA	10kA	10kA	6kA
63A	4.5kA	6kA	10kA	10kA	6kA
80A	4.5kA	6kA	10kA	10kA	6kA
100A	4.5kA	6kA	10kA	10kA	6kA
<b>4 poles</b>					
16A	4.5kA	6kA	10kA	10kA	6kA
25A	4.5kA	6kA	10kA	10kA	6kA
40A	4.5kA	6kA	10kA	10kA	6kA
63A	4.5kA	6kA	10kA	10kA	6kA
80A	4.5kA	6kA	10kA	10kA	6kA
100A	4.5kA	6kA	10kA	10kA	6kA

Positive contact indication



TEST : test regularly : RCCB must trip.



**Technical characteristics:**  
 ? Voltage range : 230V +/- 20%  
 ? Network voltage: 50 to 700 V  
 ? Frequency: 50 / 60 Hz  
 ? Working temperature: ? 10 to +55;C  
 ? Storage temperature: ? 25 to +70;C

**Torroids:**  
 ? Max. cable length to torroid: 25m non-twisted cable 1.5mm<sup>2</sup> 50m twisted cable  
 ? Frequency: 50 / 60 Hz  
 ? Working temperature: ? 10 to +55;C  
 ? Storage temperature: ? 25 to +70;C  
 ? IP rating: IP 41

**Standards:** IEC 60755, IEC 947?2 annex B, IEC 61543, IEC 61008?1

Designation	Characteristics	Power absorbed	Positive safety contact	Cat. ref.
<b>Earth leakage relays non adjustable</b>	fixed?n: 0,03A instantaneous tripping	3VA		<b>HR500</b>
	fixed?n: 0,3A instantaneous tripping	3VA		<b>HR502</b>
<b>Earth leakage relays adjustable</b>	adjustable?n: 0,03?0,1? 0,3?0,5?1?3?10A adjustable delay: 0?0,1?0,3?0,4?0,5?1?3 s	5VA	1 C/O	<b>HR510</b>
	adjustable?n: 0,03?0,1?0,3?0,5?1?3?10A adjustable delay: 0?0,1?0,3?0,4?0,5?1?3?5 s	5VA	1 C/O	<b>HR520</b>
	adjustable?n: 0,03?0,1?0,3?0,5?1?3?10A adjustable delay: 0?0,1?0,2?0,25?0,3?0,4?0,5 s	5VA	1 C/O	<b>HR522</b>
	adjustable?n: 0,5?1? 3?5?10?20?30A adjustable delay: 0?0,1?0,2?0,25?0,3?0,4?0,5 s	5VA	1 C/O	<b>HR523</b>
	adjustable?n: 0,03?0,1? 0,3?0,5?1?3?10A adjustable delay: 0?0,1?0,3?0,4?0,5?1?3 s	6VA	1 C/O	<b>HR525</b>
	adjustable?n: 0,03?0,1?0,3?0,5?1?3?10?30A Instantaneous / sel / adjustable delay: 0?0,1?0,3?0,4?0,5?1?3 s	6VA	1 C/O	<b>HR534</b>
<b>Circular torroids</b>	Internal?l 30 mm			<b>HR700</b>
	Internal?l 35 mm			<b>HR741</b>
	Internal?l 70 mm			<b>HR742</b>
	Internal?l 105 mm			<b>HR743</b>
	Internal?l 140 mm			<b>HR744</b>
	Internal?l 210 mm			<b>HR745</b>
<b>Open rectangular torroids</b>	80 x 80 mm			<b>HR822</b>
	80 x 120 mm			<b>HR823</b>
	80 x 160 mm			<b>HR824</b>
<b>Rectangular torroids</b>	75 x 175 mm			<b>HR830</b>
	115 x 305 mm			<b>HR831</b>
	150 x 350 mm			<b>HR832</b>



HR525



HR700



HR820



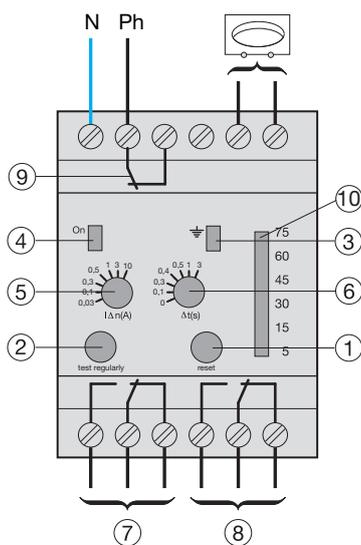
HR831

HR522 & 523 info .... no data

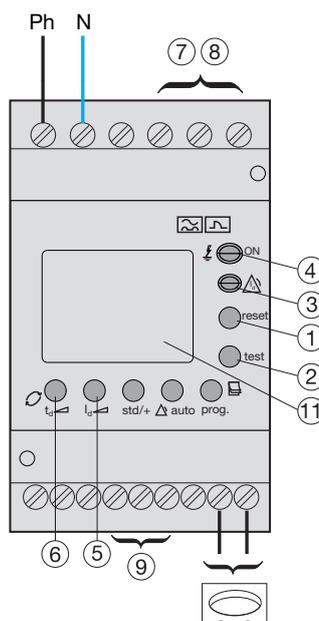
**Technical characteristics**

	HR500	HR502	HR510	HR520	HR525	HR534
supply voltage ~ 50/60 Hz	230 V ± 20%					
supervised power voltage ~ 50/60 Hz	50 to 700 V					
standard output 1 OF (tripping at 85 % of I <sub>n</sub> ± 15 %)	yes	yes	yes	yes	yes	yes
positive safety output	yes	yes	yes	yes	yes	yes
pre-alarm fault output	no	no	yes	yes	yes	yes
external test and reset button	no	no	no	no	yes	yes
sensitivity I <sub>n</sub>	30 mA	300 mA	30 - 100 - 300 - 500 mA - 1 - 3 - 10 A		30 - 100 - 300 - 500 mA - 1 - 3 - 10 - 30 A	
temporization (± 20%)	instantaneous		inst., 0,1-0,3-0,4-0,5-1-3s	inst., 0,1-0,3-0,4-0,5-1-3-5s	inst., $\overline{S}$ - 0,02 - 0,1 - 0,3 - 0,4 - 0,5 - 1 - 3 - 5 - 10 s	
A type	yes	yes	yes	yes	yes	yes
high immunity HI	yes	yes	yes	yes	no	no
consummation	3 VA	3 VA	5 VA	5 VA	6 VA	6 VA
control output	free potential changeover switch					
breaking capacity (standard output, positive safety, pre-alarm 50%)	5 A / 250 V AC1		6 A / 250 V AC1			
torroid allowed overload	30 kA / 100 ms					
voltage for reset and test push buttons	100 à 250 V					
maxi length of test/reset connection	200 m					
maxi length of torroid/relay connection	50 m maxi with twisted cable 1,5 - 25 m non-twisted cable					
relay connection : collar terminal	rigid 1,5 mm <sup>2</sup> to 4 mm <sup>2</sup> flexible 1 mm <sup>2</sup> to 2,5 mm <sup>2</sup>				0,5 mm <sup>2</sup> to 2 mm <sup>2</sup> 0,5 mm <sup>2</sup> to 2 mm <sup>2</sup>	
torroid connection	rigid 1,5 mm <sup>2</sup> to 4 mm <sup>2</sup> flexible 1 mm <sup>2</sup> to 6 mm <sup>2</sup>				0,5 mm <sup>2</sup> to 2 mm <sup>2</sup> 0,5 mm <sup>2</sup> to 2 mm <sup>2</sup>	
operating temperature	- 10 to +55 °C					
storage temperature	- 25 to +70 °C					

**HR510, HR520**



**HR525**

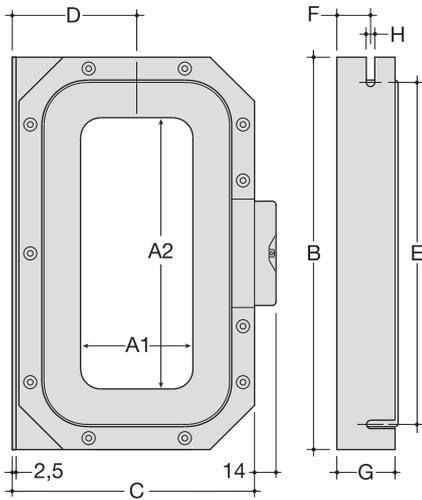


**Product presentation :**

- ① reset push button
- ② test push button
- ③ fault indicator
- ④ supply indicator
- ⑤ I<sub>n</sub> ratings (A)
- ⑥ temporization t (s)
- ⑦ standard output 1 OF
- ⑧ positive safety output
- ⑨ pre-alarm output
- ⑩ bargraph : indicates continuously the value of the leakage current, 5 to 15 %, 15 to 30 %, 30 to 45 %, 45 to 60 % and 60 to 75 % of I<sub>n</sub>.
- ⑪ LCD display

## Technical characteristics

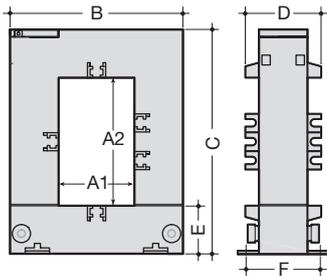
### Rectangular torroids : HR830, HR831, HR832



### Dimensions for rectangular and circular torroids (in mm)

ref.	A	A1	A2	B	C	D	E	F	G	H
<b>HR830</b>	?	70	175	260	162	85	225	22	40	7,5
<b>HR831</b>	?	115	305	400	225	116	360	25	48	8,5
<b>HR832</b>	?	150	350	460	270	140	415	28	48	8,5

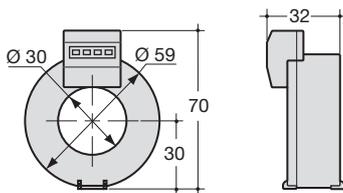
### Open rectangular torroids: HR820 to HR824



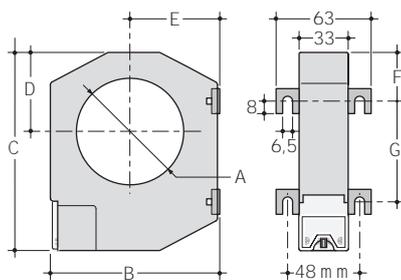
### Dimensions for open rectangular torroids (in mm)

ref.	A1	A2	B	C	D	E	F
<b>HR820</b>	20	30	89	110	41	32	46
<b>HR821</b>	50	80	114	145	50	32	46
<b>HR822</b>	80	80	145	145	50	32	46
<b>HR823</b>	80	121	145	185	50	32	46
<b>HR824</b>	80	161	184	244	70	37	46

### Circular torroids : HR700



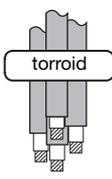
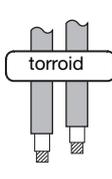
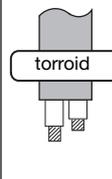
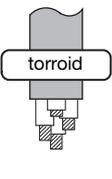
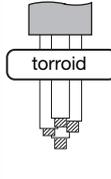
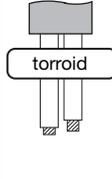
### HR741 to HR745

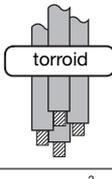
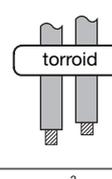


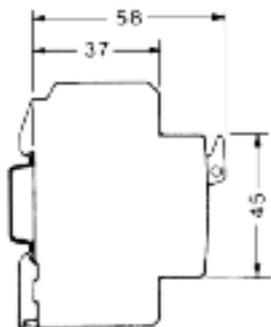
### Dimensions for circular torroids (in mm)

ref.	A	B	C	D	E	F	G
<b>HR741</b>	Ø 35	79	100	35	43	26	48,5
<b>HR742</b>	Ø 70	110	130	52	57	32	66
<b>HR743</b>	Ø 105	146	170	72	73	38	94
<b>HR744</b>	Ø 140	196	220	97	98	48,5	123
<b>HR745</b>	Ø 210	284	299	141	142	69	161

**Torroid capacity**

Torroid inner diameter		U 1000 R2V copper (1 conductor)	U 1000 R2V copper (1 conductor)	U 1000 R2V copper (2 conductors)	U 1000 R2V copper (4 conductors)	U 1000 R2V copper (4 conductors) stripped	U 1000 R2V copper (2 conductors) stripped
							
30	HR700	4 x 16 mm <sup>2</sup>	2 x 50 mm <sup>2</sup>	35 mm <sup>2</sup>	35 mm <sup>2</sup>	35 mm <sup>2</sup>	50 mm <sup>2</sup>
35	HR701	4 x 25 mm <sup>2</sup>	2 x 70 mm <sup>2</sup>	35 mm <sup>2</sup>	50 mm <sup>2</sup>	35 mm <sup>2</sup>	70 mm <sup>2</sup>
70	HR702	4 x 185 mm <sup>2</sup>	2 x 400 or 4 x 150 mm <sup>2</sup>	35 mm <sup>2</sup>	240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
105	HR703	4 x 500 mm <sup>2</sup>	2 x 630 or 4 x 185 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
140	HR704	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
210	HR705	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
70 x 175	HR830	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
115 x 305	HR831	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
150 x 350	HR832	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
20 x 30	HR820	4 x 16 mm <sup>2</sup>	2 x 70 mm <sup>2</sup>	35 mm <sup>2</sup>	10 mm <sup>2</sup>	35 mm <sup>2</sup>	16 mm <sup>2</sup>
50 x 80	HR821	4 x 240 mm <sup>2</sup>	2 x 630 or 4 x 185 mm <sup>2</sup>	35 mm <sup>2</sup>	120 mm <sup>2</sup>	35 mm <sup>2</sup>	150 mm <sup>2</sup>
80 x 80	HR822	4 x 500 mm <sup>2</sup>	2 x 630 or 4 x 185 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
80 x 120	HR823	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>
80 x 160	HR824	4 x 630 mm <sup>2</sup>	2 x 630 or 4 x 240 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>	35 mm <sup>2</sup>	300 mm <sup>2</sup>

Torroid inner diameter		H07 V - U copper (1 conductor)	H07 V - U copper (1 conductor)
			
30	HR700	4 x 35 mm <sup>2</sup>	2 x 70 mm <sup>2</sup>
35	HR701	4 x 50 mm <sup>2</sup>	2 x 95 mm <sup>2</sup>
70	HR702	4 x 240 mm <sup>2</sup>	2 x 400 or 4 x 185 mm <sup>2</sup>
105	HR703	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
140	HR704	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
210	HR705	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
70 x 175	HR830	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
115 x 305	HR831	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
150 x 350	HR832	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
20 x 30	HR820	4 x 10 mm <sup>2</sup>	2 x 35 mm <sup>2</sup>
50 x 80	HR821	4 x 185 mm <sup>2</sup>	2 x 240 mm <sup>2</sup>
80 x 80	HR822	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
80 x 120	HR823	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>
80 x 160	HR824	4 x 400 mm <sup>2</sup>	2 x 400 or 4 x 240 mm <sup>2</sup>



**Description**

Protection and control of circuits against overloads and short circuits :

- In domestic installations
- In commercial and light Industrial electrical distribution systems

**Technical data :**

- Fuse carriers suitable for fuses which fully comply with the dimensional, power loss, fusing factor, discrimination and time current characteristics of BS 136. Complies with BS1361:1971:

- short-circuit rating : 16.5kA (i.e. no further consideration of fault levels is necessary)
- colour coded ratings
- connection capacities :  
top : cable + busbar  
Rigid conductor 16mm<sup>2</sup>  
Flexible conductor 10mm<sup>2</sup>

Designation	Current rating (Amps)	Colour	Width in 17.5mm	Pack. qty.	Cat. Ref.
<b>Fuse carriers</b>	5A - 240V	White	1	12	LB113
	15A - 240V	Blue	1	12	LB115
	20A - 240V	Yellow	1	12	LB116
	30A - 240V	Red	1	12	LB118
<b>BS 1361 HRC Spare cartridge fuses</b> (suitable only for L11x carriers)	5A (23 x 6.35 x 4.8mm)	White		50	L153
	15A (26 x 10.32 x 6.4mm)	Blue		50	L155
	20A (26 x 10.32 x 6.4mm)	Yellow		50	L156
	30A (29 x 12.7 x 8mm)	Red		50	L158

Need photos

**Fuse carrier 32 Amps max.**  
 Protection and control of circuits against overloads and Short-circuit :

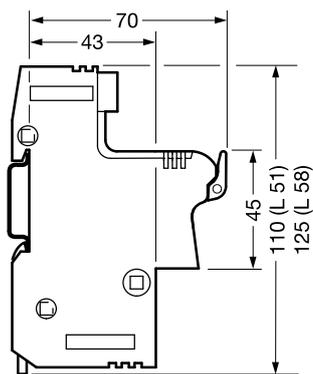
- In single or three phase subcircuits
- Suitable for fuses which comply with IEC 269
- Rating voltage : 415 V a.c.  
250 V d.c.

- Fusing factor : class Q1
- Rated breaking capacities; 80kA at 415 V a.c.  
40kA at 250 V d.c.
- Complies with IEC269-2, 2-1
- For spare cartridge fuses 10.3 x 38mm



LS501

Designation	Description	Width in 17.5mm	Pack. qty.	Cat. Ref.
<b>Fuse carriers</b>				
For cylindrical cartridge fuses 10.3 x 38mm (supplied without fuse)	1P	1	12	LS501
	1P + N	2	12	LS512
	2P	2	6	LS502
	3P	3	6	LS503
	3P + N	4	3	LS504
	1P with indicating light	1	12	LS531



**Fuse carriers L 51**  
 For spare cartridge fuses  
 14 x 51mm  
 50A 690V  
 Complies with IEC 947-3

**Connection capacity :**  
 35mm<sup>2</sup> rigid cable  
 25mm<sup>2</sup> flexible cable

**Fuse carriers L 58**  
 For cylindrical cartridge fuses  
 22 x 58mm  
 125A 690V  
 Complies with IEC 947-3

**Connection capacity :**  
 50mm<sup>2</sup> rigid cable  
 35mm<sup>2</sup> flexible cable

Can be padlocked in the off position

Designation	Description	Width in 17.5mm	Pack qty.	Cat. Ref.
<b>L51 fuse carrier</b>	1 phase	1.5	10	LR601
	2 phases	3	5	LR602
	3 phases	4.5	3	LR603
	3 phases + neutral	6	2	LR604
	1 phases + neutral	3	5	LR612



LR601

<b>L58 fuse carrier</b>	1 phase	2	6	LR701
	2 phases	4	3	LR702
	3 phases	6	2	LR703
	3 phases + neutral	8	1	LR704
	1 phases + neutral	4	3	LR712



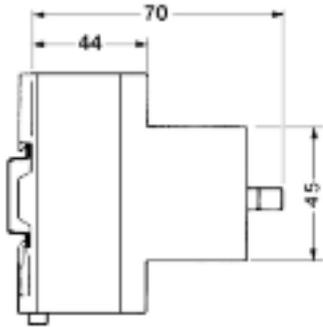
LR703

## Switchfuse

Designation	Description	Width in 17.5mm	Pack qty.	Cat. Ref.
32A	1 pole + neutral	1.5	12	LC732
63A	1 pole	1.5	12	LC163
63A	1 pole + neutral	3	6	LC563
32A	3 pole	4.5	4	LC332
63A	3 pole	4.5	4	LC363
63A	3 pole + neutral	6	3	LC363N



LC563



**Description**  
To ensure localised control and protection of single and three phase motors. All motor starters have thermal and adjustable magnetic trip.

**Technical data :**  
- Adjustable thermal relay  
- AC3 utilisation category

**Connection capacity**  
2 conductors  
Max size 1 to 4mm<sup>2</sup> flexible  
1.5 tomm<sup>2</sup> 6 rigid

**Conform to :**  
IEC 947-1, IEC947-2

**Note :**  
Please consult us for enclosure selection

**Options :**  
Undervoltage release :  
MZ528N, MZ529N

Auxiliary contacts :  
MZ520N, MZ527N

Alarm contact :  
MZ527N



MM501N



MZ520N



MZ527N



MZ521N

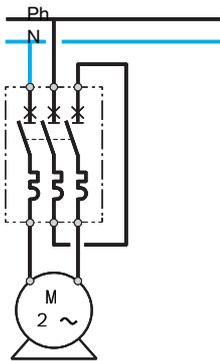
Designation	Current setting	Standard power motor 50/60Hz 230V (kW)	Rating of 3 phase (AC3 category) 400V (kW)	Width in 17.5mm	Pack qty.	Cat. Ref. type B
<b>Motor starters</b>	0.1 - 0.16A	-	-	-	1	MM501N
	0.16 - 0.24A	-	0.06	2.5	1	MM502N
	0.24 - 0.4A	0.06	0.09	2.5	1	MM503N
	0.4 - 0.6A	0.09	0.12	2.5	1	MM504N
	0.6 - 1.0A	0.12	0.25	2.5	1	MM505N
	1.0 - 1.6A	0.25	0.55	2.5	1	MM506N
	1.6 - 2.4A	0.55	0.8	2.5	1	MM507N
	2.4 - 4.0A	0.8	1.5	2.5	1	MM508N
	4.0 - 6.0A	1.5	2.5	2.5	1	MM509N
	6.0 - 10A	2.5	4.0	2.5	1	MM510N
10 - 16A	4.0	7.5	2.5	1	MM511N	
16 - 20A	5.5	9.0	2.5	1	MM512N	
20 - 25A	5.5	12.5	2.5	1	MM513N	
<b>Auxiliary contacts</b> (act as an indicating control device to monitor the ON or OFF position)		1C + 1O	2A - 400V~ 3.5A - 230V~	0.5	1	MZ520N
<b>Alarm contacts</b> (mounted inside the motor starter)		1C	2A - 400V~ 3.5A - 230V~		1	MZ527N
<b>Under voltage release</b> (to prevent automatic restarting of the controlled device)			230V~ 50Hz		1	MZ528N
			400V~ 50Hz		1	MZ529N
<b>Surface mounting enclosure</b> w78 x h150 x d95mm		weatherproof IP55 removable window			1	MZ521N
<b>Emergency stop button</b> IP65, mounted on surface mounting enclosure MZ521N					1	MZ530N

## Technical specifications

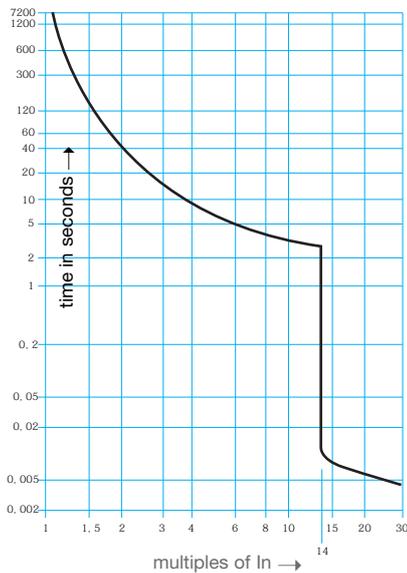
### Electrical characteristics

- Electrical supply : 230/400V
- Ambient temperature range : 25°C to +55°C
- Working life : 100 000 operations AC-3
- Maximum of 40 operations/hour
- Tropicalized for all climates
- Connection with clamp type, terminals connection capacity :  
Flexible : 1.0 mm<sup>2</sup> to 4 mm<sup>2</sup>  
Rigid : 1.5 mm<sup>2</sup> to 3 mm<sup>2</sup>

### Electrical connection single phase



### Time/current characteristics



	230V	400V	230/400V + spare cartridge fuses aM/gI
--	------	------	--

MM501N	150kA	150kA	150kA
MM502N			
MM503N			
MM504N			
MM505N			
MM506N			
MM507N			
MM508N			
MM509N			

MM510N			
MM511N	50kA	50kA	50kA
MM512N			
MM513N			

Nominal breaking capacity  $\geq$  short circuit current : fuses are not necessary, if nominal breaking capacity  $<$  short circuit current : fuses must be used, breaking capacity of association is 80kA (with BS 88 fuses)

### Under voltage release (no volt coil)

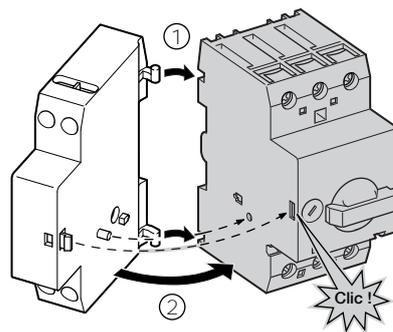
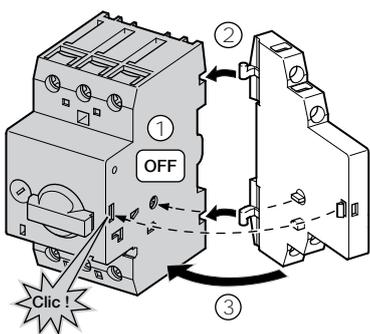
MZ528 N	MZ529N
230V~	400V~

### Auxiliary contact (mounted inside starter)

MZ520N
2A - 400V~
3.5A - 230V~

### Alarm contact (mounted inside starter)

MZ527N
2A - 400V~
3,5A - 230V~



## Photovoltaic fuse carriers and fuses

DC protection of photovoltaic strings against overload and short-circuits.

### Technical data

- sizes: L38 (10 x 38)
- class of operation: gPV (PV fuse)
- poles: 1P, 2P
- voltage rating: 1000V DC for fuse carriers and 900V DC for fuses
- fuse carriers current rating: 32A
- fuses current rating: 2 to 20A
- breaking capacity: 30kA

- minimum interrupting: 2 x In (2-3-4A), 1.9 x In (6-8-10-12A), 1.6 x In (16-20A)

**Connection capacity**  
rigid conductors: 16  
flexible conductors: 10

Comply with IEC 60269-2, IEC 60269-2-1 and IEC 60947-3

## Switch disconnectors

Designed for photovoltaic application but fully compatible to any DC purposes. Contact making and break independent to operator speed.

### Technical data

- poles: 4P
- voltage rating: 1000V DC 21B
- current rating: 32A

**Connection capacity**  
rigid conductors: 16  
flexible conductors: 10

Comply IEC 60 947-3



L501PV



SB432PV

Designation	In (A)	Characteristics	Pack qty.	Cat. Ref.
L38 photovoltaic fuse carriers 1000V DC	32	single pole	12	L501PV
	32	double pole	12	L502PV
L38 photovoltaic fuse carriers 900V DC	1		10	LF301PV
	2		10	LF302PV
	3		10	LF303PV
	4		10	LF304PV
	5		10	LF305PV
	6		10	LF306PV
	8		10	LF308PV
	10		10	LF310PV
	12		10	LF312PV
	15		10	LF315PV
	16		10	LF316PV
	20		10	LF320PV
25		10	LF325PV	
32		10	LF332PV	
DC switch disconnectors	32	4 poles, 1000 V DC	1	SB432PV
Double pole polarized surge protection devices photovoltaic $U_{cpv} \leq 1000V$ DC		25kA, 4kAV, class 2 with end of life indicator		SBV325

SPDs with plug in cartridge with very high, high and medium discharge current capacity (65 kA, 40 kA and 15 kA).

SPDs with plug in cartridge ensure :

- General protection of electrical or electronic equipment,
- Protection in common and differential mode for domestic, industrial and commercial buildings.

**Common characteristics :**  
 SPDs with base and cartridges. Available in 2 versions :

- SPDs with base and plug in cartridges with an end of life indication LED
- SPDs with base and auxiliary contact for remote signalling and plug in cartridges with reserve protection indicator .

This version, with reserve indicator, shows the intermediary state, with indication of the need to change the cartridge before disconnection, but keeps the maximal protection capacity till the end.

For remote signalling, an auxiliary contact (R version) is used to report the information of condition indication until the end of life of the product.

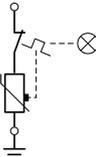
The cartridge allows simple replacement without the need to cut-off the power supply

- SPDs are equipped with integrated thermic and dynamic disconnection

- Connection capacity of terminal blocks, (L, N/E) :
- 25mm<sup>2</sup> flexible conductor,
- 35mm<sup>2</sup> rigid conductor

**For auxiliary contact :**

- 0.5mm<sup>2</sup> mini
- 1.5mm<sup>2</sup> maxi
- Degree of protection : IP 203 (in enclosure).

	Designation	Characteristics	Width in I 17.5mm	Cat. Ref.
 <p>SPN165R</p>	<p><b>SPDs with plug in cartridge</b></p> <p>I max. 20 kA</p> <p>Un :230/400 V ~ 50/60 Hz</p>	<p>1 poles 1 Ph + N with reserve indicator and remote signalling</p> <p>Up : 1.5 kV at In</p>	1	SPN165R
	<p>I max. 65 kA</p> <p>Un: 230/400 V ~ 50/60 Hz</p>	<p>2 poles 1 Ph + N with reserve indicator and remote signalling</p> <p>Up : 1.3 kV at In</p>	2	SPN265R
 <p>SPN465R</p>		<p>4 poles 3 Ph + N with reserve indicator and remote signalling</p> <p>Up : 1.5 kV at In</p>	4	SPN465R



SPN240R



SPD415D

Designation	Characteristics	Width in 17.5mm	Cat. Ref.
SPDs with plug in cartridge  I max. 40 kA Un :230/400 V ~ 50/60 Hz	- Single pole 1 Ph Up : 2 kV at In	1	SPN140C
	- Single pole 1 Ph Up : 1.2 kV at In	1	SPD140D
	- 2 poles 1 Ph + N with reserve indicator and remote signalling Up : 1.2 kV at In	2	SPN240R
	- 2 poles 1 Ph + N Up : 1.2 kV at In	2	SPD240D
	- 4 poles 3 Ph + N with reserve indicator and remote signalling Up : 1.2 kV at In	4	SPN440R
	- 4 poles 3 Ph + N Up : 1.2 kV at In	4	SPD440D
SPDs with plug in cartridge  I max. 15 kA Un: 230/400 V ~ 50/60 Hz	- 2 poles 1 Ph + N with reserve indicator and remote signalling Up : 1.0 kV at In	2	SPN215R
	- 2 poles 1 Ph + N Up : 1.0 kV at In	2	SPD215D
	- 4 poles 3 Ph + N with reserve indicator and remote signalling Up : 1.0 kV at In	4	SPN415R
	- 4 poles 3 Ph + N Up : 1.0 kV at In	4	SPD415D

## Replacement cartridges for SPDs with plug in cartridge

**Replacement cartridges**  
The cartridge allows simple replacement without the need to cut-off the power supply.

Cartridges are available for all discharge currents (65 kA, 40kA, 15kA) with or without reserve protection indication.

A keying system exists to prevent a line cartridge being interchanged by mistake with a neutral and vice versa



SPN065R



SPN065N

Designation	Characteristics	Cat Ref..
Replacement cartridges	Phase for :	SPN 265R, SPN 465R
		SPN 140C
		SPN 240R, SPN 440R
		SPD 140D, SPD 240D, SPD 440D
		SPN 215R, SPN 415R
		SPD 215D, SPD 415D
Remark : For a replacement of cartridges, choose only the same reference as the previous cartridge.	Neutral for:S	PN 265R, SPN 465R,
		SPN 240R, SPN 440R, SPN 215R, SPN 415R
		SPDxxxD
Cartridge for photovoltaic pv ≤ 1000V DC	polarized +/- for SPV325	SPN065R
	earth for SPV325	SPN065N

**Description**

Thanks to these characteristics, the new range of monobloc SPDs is particularly adapted for the residential and commercial application.

These SPDs can ensure the main protection of equipment and ensure the main protection of equipment and ensure both common and differential mode. The end of life protection is ensured by a thermal disconnecter and clearly indicates with a visual indication window.

**Connection capacity:**

- 25mm<sup>2</sup> flexible cables
- 35mm<sup>2</sup> rigid cables

SPDs are approved according to IEC/EN 61643



SPM240E



SPM440E

Designation	Characteristics	Width in I 17.5mm	Pack qty	Cat. Ref.
<b>Monobloc SPDs</b> I <sub>max</sub> = 65kA U <sub>n</sub> = 230 / 400V ~	1 Ph+N I <sub>n</sub> = 35kA U <sub>p</sub> = 1.8V to I <sub>n</sub>	2	1	<b>SPM265E</b>
	3 Ph + N I <sub>n</sub> = 35kA U <sub>p</sub> = 1.8V to I <sub>n</sub>	4	1	<b>SPM465E</b>
<b>Monobloc SPDs</b> I <sub>max</sub> = 40kA U <sub>n</sub> = 230 / 400V ~	1 Ph+N I <sub>n</sub> = 20kA U <sub>p</sub> = 1.5V to I <sub>n</sub>	2	1	<b>SPM240E</b>
	3 Ph + N I <sub>n</sub> = 20kA U <sub>p</sub> = 1.5V to I <sub>n</sub>	4	1	<b>SPM440E</b>
<b>Monobloc SPDs</b> I <sub>max</sub> = 20kA U <sub>n</sub> = 230 / 400V ~	1 Ph+N I <sub>n</sub> = 10kA U <sub>p</sub> = 1.3V to I <sub>n</sub>	2	1	<b>SPM220E</b>
	3 Ph + N I <sub>n</sub> = 10kA U <sub>p</sub> = 1.3V to I <sub>n</sub>	4	1	<b>SPM420E</b>

# Surge protective devices with low voltage protection level

## SPDs with low voltage protection level

To protect very sensitive electronic equipment. The fine protection completes the main protection and can protect 1 or several electronic devices.

Optimal coordination is obtained when cascaded with a main protection device (lower  $U_p$  see table below)  
Protection is assured in both common and differential modes.

**Discharge current :**  
**I max. 8 kA (8/20 wave).**

A green LED on the front face indicates the status of the SPD connected in series with the equipment that needs to be protected.  
Connected in series with the equipment that needs to be protected.

**Connection capacity :**  
- 6mm<sup>2</sup> flexible conductor  
- 10mm<sup>2</sup> rigid conductor .

Degree of protection : IP 20 (in enclosure).

Complies with NF EN 61-643-11 September 2002

Suitable for every earthing system.

	Designation	Characteristics	Width in I 17.5mm	Cat. Ref.
 SPN208S	SPD With low voltage protection level	2 poles 1 Ph + N	2	SPN208
	With low voltage protection level	2 poles 1 Ph + N	2	SPN208S
 SPN408S	Un :230/400 V ~ 50/60 Hz	4 poles 3 Ph + N	3	SPN408S
	Up (Ph/ N/ $\text{≐}$ ) : 1,2 kV at In Up (Ph/N) : 1 kV at In	Voltage protection level with a main + fine protection : Up 800 V		

## Surge protective devices for telephone lines

**SPDs for telephone lines.**  
For the protection of receiver against transient current surge vehicled by telephone lines (fax, modem, etc...)  
Protection is assured in both common and differential modes

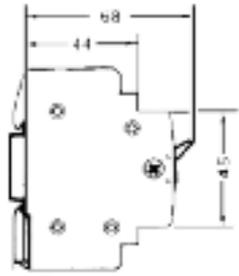
In-line connection on telephone line with receiver to be protected.

**Discharge current :**  
**I max 10 kA (8/20 wave).**

**Connection capacity**  
- 0.5 to 2.5mm<sup>2</sup> flexible conductor  
- 0.5 to 2.5mm<sup>2</sup> rigid conductor

**Degree of protection :**  
IP 10 (in enclosure).  
Complies with IEC 61643-21

	Designation	Characteristics	Width in I 17.5mm	Cat. Ref.
 SPN504	Voltage surge protection for analog telephone lines	Un : 130 V Up : 600 V	1	SPN505
	Voltage surge protection for digital telephone lines	Un : 40 V Up : 600 V	1	SPN504



**Description**  
For use as an isolating switch in all types of circuit as defined in the IEE wiring regulations

**Technical data :**  
AC 22 duty specification :  
IEC 947-3

**In : 25, 32A**  
Shrouded cable clamps

**Connection capacity :**  
16mm<sup>2</sup> rigid conductor  
10mm<sup>2</sup> flexible conductor

**In : 40, 63, 80A**  
"Q" version for 32A.  
Cable clamps  
Connection capacity :  
25mm<sup>2</sup> rigid conductor  
16mm<sup>2</sup> flexible conductor

**In : 100A**  
Cable clamps,  
Connection capacity :  
50mm<sup>2</sup> rigid conductor  
35mm<sup>2</sup> flexible conductor

All switches have a green/red toggle indication giving an obvious contact indication.

Designation	characteristics	Width in I 17.5mm	Pack qty.	Cat. Ref.
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SB125S

<b>Single pole</b> 	1 x 25A	250V~	1	12	SB125Q
	1 x 32A	250V~	1	12	SB132Q
	1 x 40A	250V~	1	12	SB140Q
	1 x 63A	250V~	1	12	SB163Q
	1 x 80A	250V~	1	12	SB180Q
	1 x 100A	250V~	1	12	SB199Q



SB232S SB240S

<b>Double pole</b> 	2 x 25A	400V~	1	12	SB225Q
	2 x 32A	400V~	1	12	SB232Q
	2 x 32A	400V~	2	6	SB232Q
	2 x 40A	400V~	2	6	SB240Q
	2 x 63A	400V~	2	6	SB263Q
	2 x 80A	400V~	2	6	SB280Q
	2 x 100A	400V~	2	6	SB299Q



SB399S

<b>Triple pole</b> 	3 x 25A	400V~	2	6	SB325Q
	3 x 32A	400V~	2	6	SB332Q
	3 x 32A	400V~	3	4	SB332Q
	3 x 40A	400V~	3	4	SB340Q
	3 x 63A	400V~	3	4	SB363Q
	3 x 80A	400V~	3	4	SB380Q
	3 x 100A	400V~	3	4	SB399Q

<b>Four pole</b> 	4 x 25A	400V~	2	6	SB425Q
	4 x 32A	400V~	2	6	SB432Q
	4 x 32A	400V~	4	3	SB432Q
	4 x 40A	400V~	4	3	SB440Q
	4 x 63A	400V~	4	3	SB463Q
	4 x 80A	400V~	4	3	SB480Q
	4 x 100A	400V~	4	3	SB499Q



SF118F



SF219F



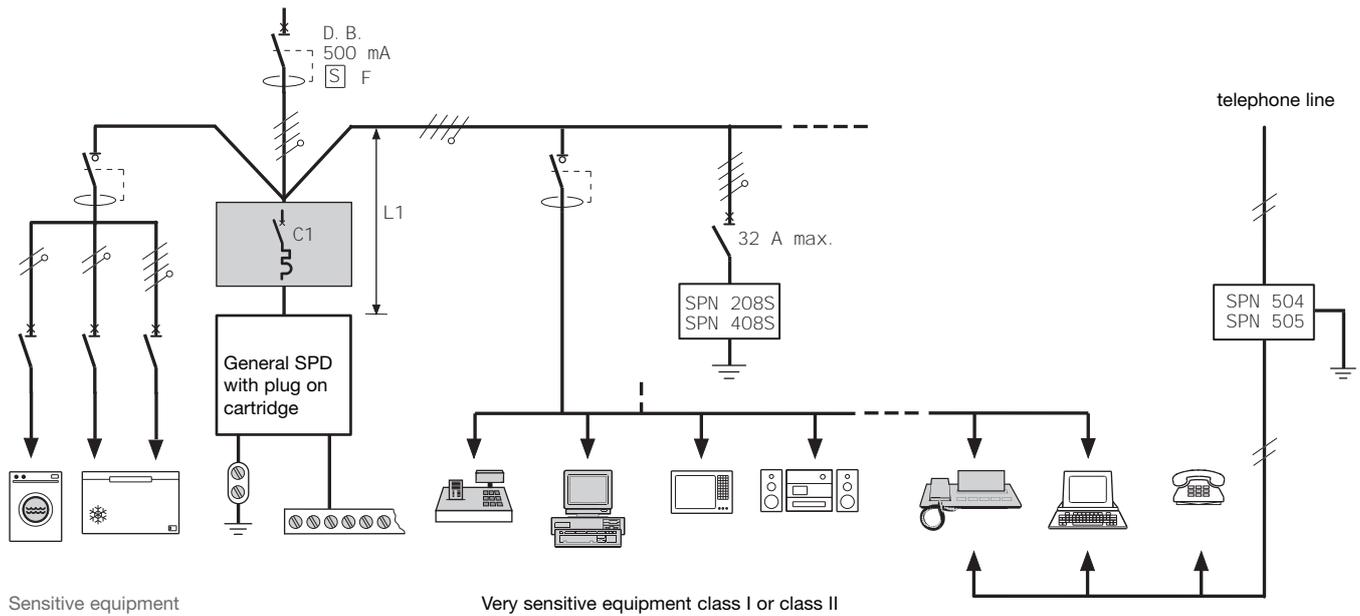
SF263



SF463

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat. Ref.
Switches, 2 ways Single pole	1 x 25A    250V~	1	12	SF118F
1NO + 1NC	2 x 25A    250V~	1	12	SF115
Double pole	2 x 25A    250V~	2	6	SF218F
<b>Switches, Centre - off changeover</b>				
Single pole	1 x 25A    250V~	1	12	SF119F
	1 x 40A    250V~	1	12	SF119G
Double pole	2 x 25A    250V~	2	6	SF219F
	2 x 40A    250V~	2	6	SF219G
	2 x 63A    250V~	2	6	SF263
Triple pole	3 x 40A    400V~	3	4	SF319G
Four pole	4 x 40A    400V~	4	3	SF419G
	4 x 63A    630V~	4	3	SF463
Handle link pin for switch handles	1 set includes 5 pins 2 mod width 5 pins 3 mod width 5 pins 4 mod width		1 set	SZ010

Installation example



Some installation rules for SPDs

- General SPD protects the whole installation by diverting the lightning current to the earth. Fitted in directly downstream the type S differential function or delayed for system TT and TN-S.
- The cable length L1 must be reduced to less than 0,5m
- The resistance of the earth connection must be weakest possible (approx. 10 ) and only one is requested by installation,
- SPDs SPN 208 and SPN 408S protect very sensitive devices of class I and class II.
- A cable length of at least 1m is requested between general and secondary SPD to ensure a minimum impedance in order to avoid the simultaneous bringing into conduction of both SPDs,
- SPDs SPN 504 and SPN 505 protect analog or digital telephone lines from very sensitive receivers.

Note. : When SPD is fitted downstream of RCD, the system should preferably be selectif (with time delay) to avoid nuisance tripping.

Choice of disconnection device

The choosen device is an MCB

Selection chart for disconnection device according to the SPD type

General SPD	C1 (1)
SPN 165P	32 A curve C
SPN 265R	
SPN 465R	
SPN 140C - SPD 140D	32 A curve C
SPN 240R - SPD 240D	
SPN 440R - SPD 440D	
SPN 215R - SPD 215D	32 A curve C
SPN 415R - SPD 415D	

(1) The breaking capacity of MCB must be chosen according to the short circuit intensity at the head of the installation and according to the number of poles (1,2 or 4)

Distressing of SPD

Successive discharging of current due to lightning reduces progressively the performance of SPD's, with the consequence of a possible short circuit for the installation.

For this reason, all our SPDs are fitted with an automatic thermic and dynamic disconnection device LED on front indicates the good working of the device :

- For normal version :  
Green = OK                      Red = replacement
- For version with reserve indicator :  
Green = OK                      Yellow = caution                      Red = replacement
- For version with electric LED for SPDs for fine protection  
Green = OK                      LED off = replacement

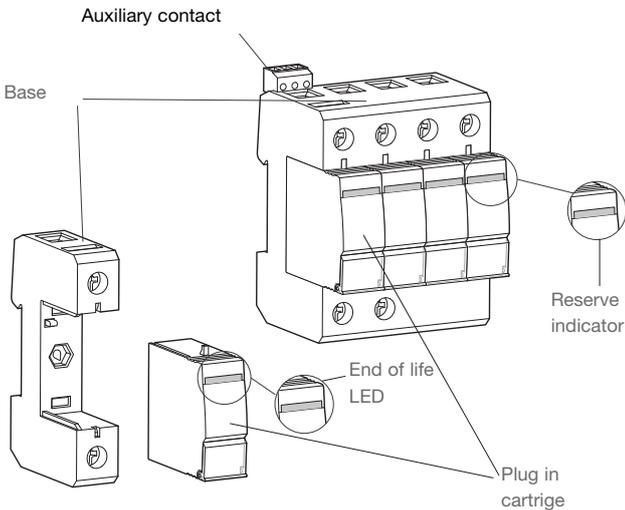
**Warranty**  
Warranty can not be applied for SPDs as their life expectancy depends on the perturbation level absorbed to protect the electric installation.

## SPDs with plug in cartridge

Presentation of 1 pole and multi pole SPDs :

Available in two versions :

- Base with an auxiliary contact and cartridges with reserve indicator
- Base without auxiliary contact and cartridges with end of life LED



## Keying system for fitting of neutral and phase cartridge

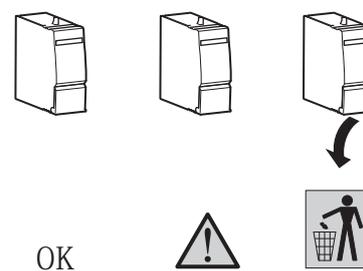
Neutral plug in cartridges can not be fitted in slots for phase cartridges and visa versa

On the front of the cartridge, a mechanical LED indicates the state of SPD

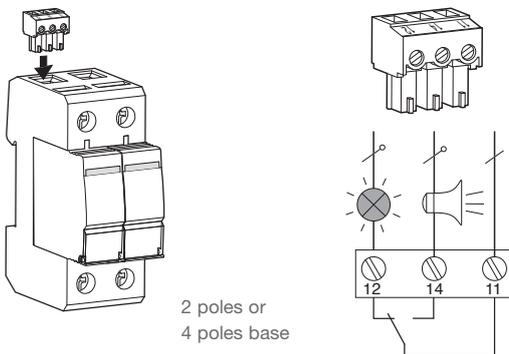
With reserve indicator



End of live LED



## Auxiliary contact for signalling and remote monitoring



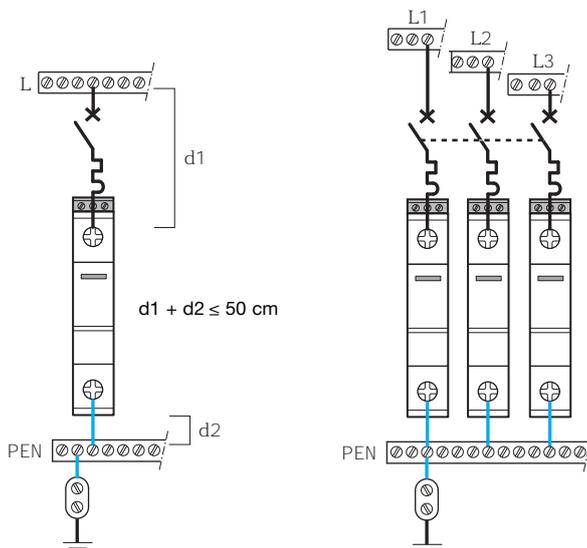
Auxiliary contact connection capacity	mini	0,5 mm <sup>2</sup>	
	maxi	1,5 mm <sup>2</sup>	
Remote signalling	voltage	230 V~	250 V ...
	nominal current	1 A	0,1 A

## Connection diagrams

Single pole SPDs : SPN1xx - SPD1xx

Protection only in common mode

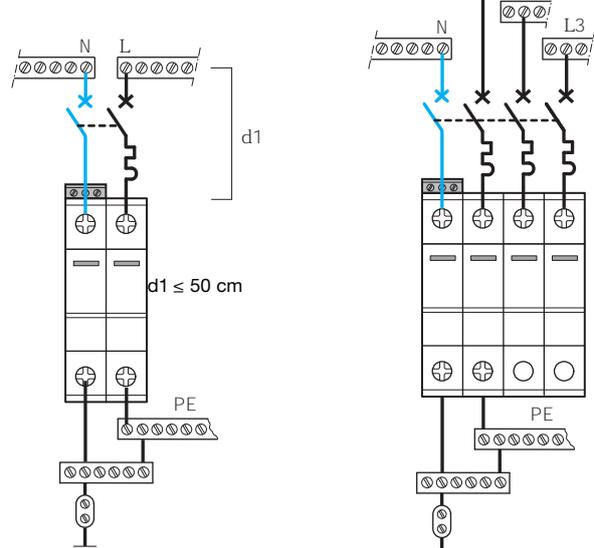
### IT / TN-C



## Multi pole SPDs : SPN2xx - SPN4xx - SPD2xx - SPD4xx

protection is assured in both common and differential modes without adding devices

### TT / TN-S



## Technical characteristics of single pole SPDs

References		SPN140C	SPD140D
Installation exposure level (risk)		medium	medium
Installation of SPDs		in parallel	in parallel
Nominal voltage Un frequency		230 V~ 50/60 Hz	230 V~ 50/60 Hz
Max. continuous operating voltage Uc		440 V	275 V
Voltage protection level Up		2 kV	1,2 kV
Discharge current capacity 8/20 $\mu$ s wave	nominal current In max. current I <sub>max</sub>	15 kA 40 kA	15 kA 40 kA
Degree of protection		IP 20	IP 20
Short circuit resistance I <sub>cc</sub> (MCB - curve C)		20 kA - 32 A	20 kA - 32 A
Temperature	working storage	-20°C to +60°C -40°C to +70°C	-20°C to +60°C -40°C to +70°C
End of live LED		yes	yes
Reserve indicator + auxiliary contact		-	-
Domestic building	collective/individual industrial/commercial	yes yes	yes yes
Earthing systems		IT, TN-C	IT, TN-C
Max. connection capacity (Ph, N, E)	flexible rigid	25 mm <sup>2</sup> 35 mm <sup>2</sup>	25 mm <sup>2</sup> 35 mm <sup>2</sup>
screw head		PZ2	PZ2

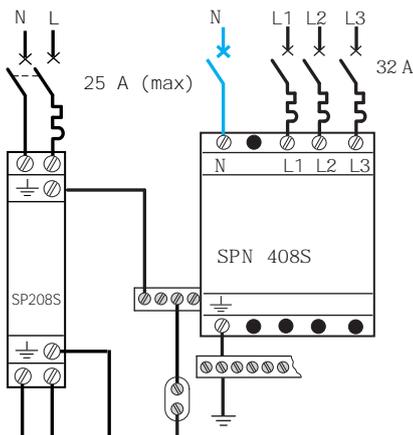
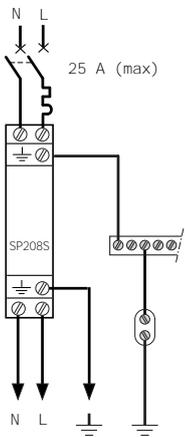
## Technical characteristics of multipole SPDs

References		SPN265R - SPN465R	SPN240R, SPN440R SPD240D, SPD440D	SPN215R, SPN415R SPD215D, SPD415D
Installation exposure level (risk)		very high	medium	low
Installation of SPDs		in parallel	in parallel	in parallel
Nominal voltage Un frequency		230/400 V~ 50/60 Hz	230/400 V~ 50/60 Hz	230/400 V~ 50/60 Hz
Max. continuous operating voltage Uc	between Phase / Neutral between Neutre / PE	255 V 275 V	255 V 275 V	255 V 275 V
Protection mode	common differential	yes yes	yes yes	yes yes
Voltage protection level Up		1,5 kV	1,2 kV	1,0 kV
Discharge current capacity 8/20 $\mu$ s wave	nominal current In maxial current I <sub>max</sub>	20 kA 65 kA	15 kA 40 kA	5 kA 15 kA
Degree of protection		IP 20		
Short circuit resistance I <sub>cc</sub>	(MCB - curve C)	20 kA - 32 A	20 kA - 32 A	10 kA - 32 A
Working temperature		-40°C à +60°C		
End of life LED		-	SPN 240D - SPN 440D	SPN 215D - SPN 415D
Reserve indicator + auxiliary contact		SPN 265R - SPN 465R	SPN 240R - SPN 440R	SPN 215R - SPN 415R
Domestic buildings	collective / individual industrial / commercial	yes yes		
Earthing systems		TT TN - S	TT TN - S	TT TN - S
Connection capacity (Ph, N, E)	flexible rigid	25 mm <sup>2</sup> 35 mm <sup>2</sup>		
Screw head		PZ2		

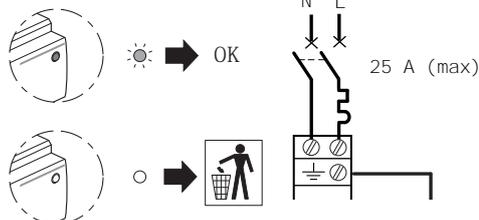
## Technical characteristics of secondary SPDs (fine protection)

References		SPN208	SPN408S
Installation exposure level (risk)		low	low
Installation of SPDs		in parallel	in parallel
Nominal voltage $U_n$ frequency		230 V~ 50/60 Hz	230/400 V~ 50/60 Hz
Max. continuous operating voltage $U_c$	between N / PE between Phase and Neutral	255 V 255 V	255 V 255 V
Protection mode	common differential	yes yes	yes yes
Voltage protection level $U_p$		1,5 kV	1,0 kV
Discharge current capacity 8/20 $\mu$ s wave	nominal current $I_n$ maximal current $I_{max}$	2 kA 8 kA	2 kA 8 kA
Degree of protection		IP 20	IP 20
Short circuit resistance $I_{cc}$ (with fuse or associated MCB)		6 kA - 16 A	6 kA - 32 A
Temperature	working storage	-25°C to +40°C -25°C to +60°C	-25°C to +40°C -25°C to +40°C
Well functioning indicator		green LED	green LED
Domestic buildings	collective / individual industrial / commercial	yes yes	yes yes
Earthing systems		TT, IT, TN - S	TT, IT, TN - S
Connection capacity (Ph, N, E)	flexible min./max. rigid min./max.	2,5/6 mm <sup>2</sup> 6/10 mm <sup>2</sup>	2,5/6 mm <sup>2</sup> 6/10 mm <sup>2</sup>
Screw head		PZ1	

## SPDs SPN 208S and SPN 408S



Coordination : between main SPD and secondary level SPDs, this coordination allows to reduce the protection level  $U_p$  to  $\leq 800$  V



# Enclosed fuse combination switches and switch disconnecter



## The advantages for you :

- Basic timer to limit energy costs via time-based control of lighting
- Power factor correction to reduce the distribution – only 2 modules
- Easy to commission using our PC software or by hand
- Choice of astro or expert mode for each channel
- Can be programmed without voltage
- 56 memory units available

## Technical data :

- Standard IEC 60947-2 Seven-day timer
- Rated voltage : 230V AC
- Signal output : 16A
- Switching channels : 1 or 2
- Programming : By hand or using Hager PC software
- Astro mode : Individual entry of degrees of longitude and latitude

# Expert tips

1



**Knock outs and removable gland plate**  
2.0mm (up to 400A)  
2.5mm (up to 630A - 800A)

5



**Neutral bar**

2



**Robust 1.2mm steel enclosure**

6



**Top or bottom fed**

3



**Terminal cover**

7



**Accepts BS88 fuses**

4



**Lockable off**

8



**Key hole mounting slots**

### Description

The Hager range of fuse combination switches has been designed to provide individual protection and control of individual circuits. The enclosures up to 200A have been designed to provide adequate cabling space without the need for additional cable spreader boxes. Operation of the device is through a door mounted rotary handle which is mechanically interlocked to prevent access to live conductors when the switch is in the on position. The

handle is also padlockable in the off position.

All versions will accept standard BS88 fuse links and can be converted to switch disconnecter by fitting copper links.

**Utilisation category**  
AC23 A/B  
Icc : 50kA

**Complies with:**  
BS EN 60-439 part 1 (enclosure)  
BS EN 60-947 part 3 (device)

**Range:**  
SPSN 20-200A (4 ratings)  
TPN 20-630A (12 ratings)  
TPSN 20-630A (12 ratings)  
IP41

**Note:**  
Maximum rated fuse links are fitted in all fuse combination switches

**Cable capacity**  
20A = 16mm<sup>2</sup>  
32A = 16mm<sup>2</sup>  
63A = 25mm<sup>2</sup>  
100A = 95mm<sup>2</sup>  
125A = 95mm<sup>2</sup>  
160A = 95mm<sup>2</sup>  
200A = 240mm<sup>2</sup>  
250A = 240mm<sup>2</sup>  
315A = 240mm<sup>2</sup>  
400A = 240mm<sup>2</sup>  
630A = 300mm<sup>2</sup> x 2  
800A = 300mm<sup>2</sup> x 2



JFG416



JFG425



MZN175

Designation	In A	Pack Qty.	Cat. Ref.		
Enclosed FCS Single pole switched neutral	20A	1	JFB202S		
	32A	1	JFB203S		
	63A	1	JFD206S		
	100A	1	JFE210S		
Triple pole & neutral	20A	1	JFB302S		
	32A	1	JFB303S		
	63A	1	JFD306S		
	100A	1	JFE310S		
	125A	1	JFG312S		
	160A	1	JFG316S		
	200A	1	JFG320S		
	250A	1	JFG325S		
	315A	1	JFH331S		
	400A	1	JFH340S		
	630A	1	JFI 363S		
	800A	1	JFI 380S		
Triple pole switched neutral	20A	1	JFB402S		
	32A	1	JFB403S		
	63A	1	JFD406S		
	100A	1	JFE410S		
	125A	1	JFG412S		
	160A	1	JFG416S		
	200A	1	JFG420S		
	250A	1	JFG425S		
	315A	1	JFH431S		
	400A	1	JFH440S		
Cable extension boxes triple pole & triple pole + switched neutral	For 125A/160A /200A	1	JZA701		
	For 315A /400A FCS	1	JZA702		
	For 630A / 800A FCS	1	JZA703		
Auxiliary contact 1AC type NO 1AC type NC			HZF301		
			HZF302		
Terminal cover	100A	2P	3P	4P	
	125A, 160A	HZF201	HZF202	HZF203	
	200A to 400A		HZF202	HZF203	
	630A to 800A		HZF204	HZF205	
			HZF206	HZF207	

### Description

The Hager range of switch disconnectors has been designed to provide individual protection and control of individual circuits up to 1250A.

The enclosures have been designed to provide adequate cabling space without the need for additional cable spreader boxes.

Operation of the device is through a door mounted rotary handle which is mechanically interlocked to prevent access to live conductors when the switch is in the "On" position. The handle is also padlockable in the "Off" position.

### Utilisation category

AC23A  
AC22A/B

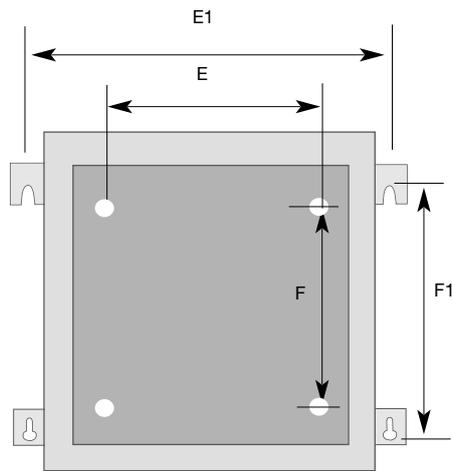
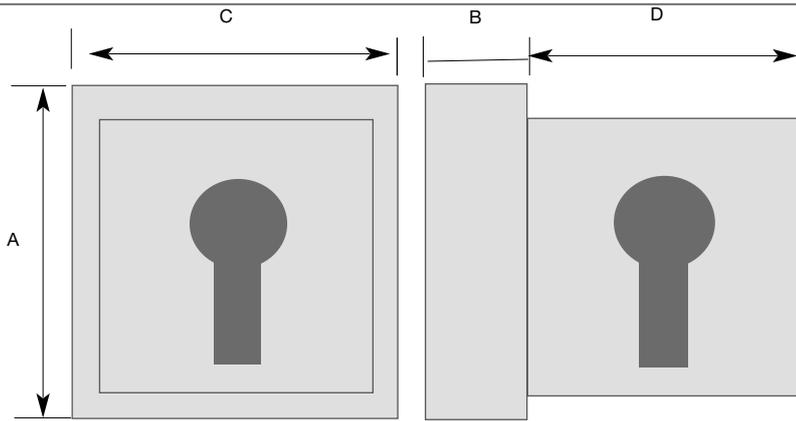
### Complies with:

BS EN 60-439 part 1 (enclosure)  
BS EN 60-947 part 3 (device).  
IP41

### Cable capacity

20A = 16mm<sup>2</sup>  
32A = 16mm<sup>2</sup>  
63A = 50mm<sup>2</sup>  
100A = 50mm<sup>2</sup>  
125A = 95mm<sup>2</sup>  
160A = 95mm<sup>2</sup>  
200A = 95mm<sup>2</sup>  
250A = 185mm<sup>2</sup>  
315A = 185mm<sup>2</sup>  
400A = 240mm<sup>2</sup>  
630A = 300mm<sup>2</sup>  
800A = 185mm<sup>2</sup> x 2  
1250A = 185mm<sup>2</sup> x 4

	Designation Enclosed LBS	In A	Pack qty.	Cat. Ref. TP & N	Cat. Ref. TP & SW N
 JAB302	IP41	20A	1	JAB302S	JAB402S
		32A	1	JAB303S	JAB403S
		63A	1	JAB306S	JAB406S
		100A	1	JAB310S	JAB410S
		160A	1	JAC316S	JAC416S
		200A	1	JAE320S	JAE420S
		250A	1	JAE325S	JAE425S
		315A	1	JAG331S	JAG431S
		400A	1	JAG340S	JAG440S
		630A	1	JAH363S	JAH463S
		800A	1	JAH380S	JAH480S
		1250A	1	JAH390S	JAH490S
		1600A	1	JAH392S	JAH492S
 JAG440	IP55	63A	1	JAB306S-IP55	JAB406S-IP55
		100A	1	JAB310S-IP55	JAB410S-IP55
		160A	1	JAC316S-IP55	JAC416S-IP55
		200A	1	JAE320S-IP55	JAE420S-IP55
		250A	1	JAE325S-IP55	JAE425S-IP55
		315A	1	JAG331S-IP55	JAG431S-IP55
		400A	1	JAG340S-IP55	JAG440S-IP55
630A	1	JAH363S-IP55	JAH463S-IP55		
Cable extension boxes for IP41 LBS	125A, 160A	1	/	JZA700	
	200A, 250A, 315A, 400A	1	/	JZA701	
	630A, 800A	1	/	JZA702	
Auxiliary contact	20A to 100A	1	/	HZ021	
	125A to 800A	1	/	HZ023	
 JAE320S-IP55	Terminal cover	125A to 200A		3P HZC201	4P HZC202
		250A to 400A		HZC203	HZC204
		630A		HZC205	HZC206
		800A		HZ036	HZ046



Cat.Ref	Cat.Ref	A	B	C	D	E	E1	F	F1
JAB302S	JAB402S	250	105	180	177	110	/	172	/
JAB303S	JAB403S	250	105	180	177	110	/	172	/
JAB306S	JAB406S	250	105	180	177	110	/	172	/
JAB310S	JAB410S	250	150	180	177	130	/	172	/
JAB316S	JAB416S	300	150	250	232	140	/	192	/
JAB320S	JAB420S	400	200	375	357	265	/	292	/
JAB325S	JAB425S	400	200	375	357	265	/	292	/
JAB331S	JAB431S	500	200	375	357	265	/	380	/
JAB340S	JAB440S	500	200	375	357	265	/	380	/
JAB363S	JAB463S	650	300	500	481.5	390	/	529	/
JAB380S	JAB480S	650	300	500	481.5	390	/	529	/
JAB390S	JAB490S	1050	300	750	747	640	/	937	/
JAB392S	JAB492S	1050	300	750	747	640	/	937	/

Cat.Ref	Cat.Ref	A	B	C	D	E	E1	F	F1
JAB306S-IP55	JAB406S-IP55	300	200	300	300	/	330	/	195
JAB310S-IP55	JAB410S-IP55	300	200	300	300	/	330	/	195
JAB316S-IP55	JAB416S-IP55	400	200	300	300	/	330	/	295
JAB320S-IP55	JAB420S-IP55	600	250	400	400	/	430	/	495
JAB325S-IP55	JAB425S-IP55	600	250	400	400	/	430	/	495
JAB331S-IP55	JAB431S-IP55	700	250	500	500	/	530	/	595
JAB340S-IP55	JAB440S-IP55	700	250	500	500	/	530	/	595
JAB363S-IP55	JAB463S-IP55	800	300	600	600	/	630	/	695

## Description

Control relays are used in installations where the current or the voltage fluctuation may damage equipments.

The range is composed of modular devices :

### EU100/101/301

Voltage control relays dedicated to protect air conditioning equipments :

EU100, EU101 single phase  
EU301 three phase

They monitor the compressor power supply and disconnect the compressor when the voltage is faulty.

### EU102/301

Voltage control relay used to survey DC or AC voltage :  
EU 102 single phase product to monitor DC or AC  
EU 302 three phase control relay used to check AC voltage

They survey a voltage and close contact as soon as the measurement is not ok.

### EU103

Current control relay used to survey DC or AC current :  
EU 103 single phase product to monitor DC or AC current direct via current transformer

It surveys a current and closes a contact as soon as the measurement is not ok.

Phase control relay EU 300 to verify phase parameters (asymmetry, loss of phase, undervoltage)

The two digital control relays EU 102 and EU 103 are equipped with an LCD indicator. During normal operation, the LCD displays the measured voltage (EU 102) or current (EU 103). The LCD and the local push buttons are also used to enter the parameter settings (type of signal, monitored levels ... )

In case of an error, the relay will close a contact (changeover contact 8A)



EU100



EU301

Designation	Characteristics	Width in I 17.5mm	Pack qty.	Cat. Ref.
Air conditioning control relay Single phase	Power supply 230V AC Under/over voltage control Umin : 0,75 Un - Umax : 1,2 Un Restart duration (5 or 10 minute) selected via bridge Output : changeover contact 8A AC1 250V~	2	1	EU100
Air conditioning control relay Single phase	Power supply 230V AC Under/over voltage control Umin/Umax : +/-5% to +/-20% Un defined via potentiometer Restart duration (5 or 10 minute) selected via switch Output : changeover contact 8A AC1 250V~	2	1	EU101
Air conditioning control relay Three phase	Power supply Un 400V AC Under/over voltage control Umin/Umax : +/-5% to +/-20% Un defined via potentiometer Restart duration (5 or 10 minute) selected via switch Output : changeover contact 8A AC1 250V~	2	1	EU301
Phase control relay	Power supply Un 400V AC Under voltage control Loss of phase, phase order control Asymetry control : +/-5% to +/-20% defined via potentiometer Output : changeover contact 8A AC1 250V~	2	1	EU300

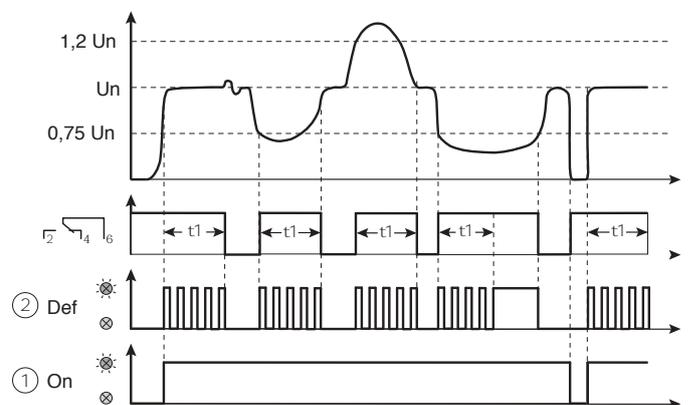
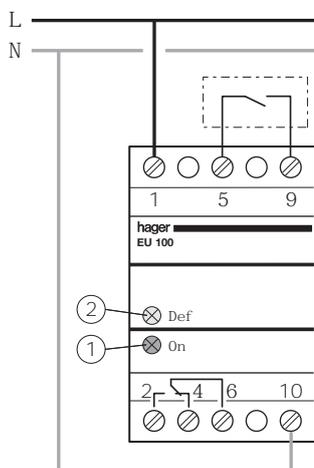


EU102

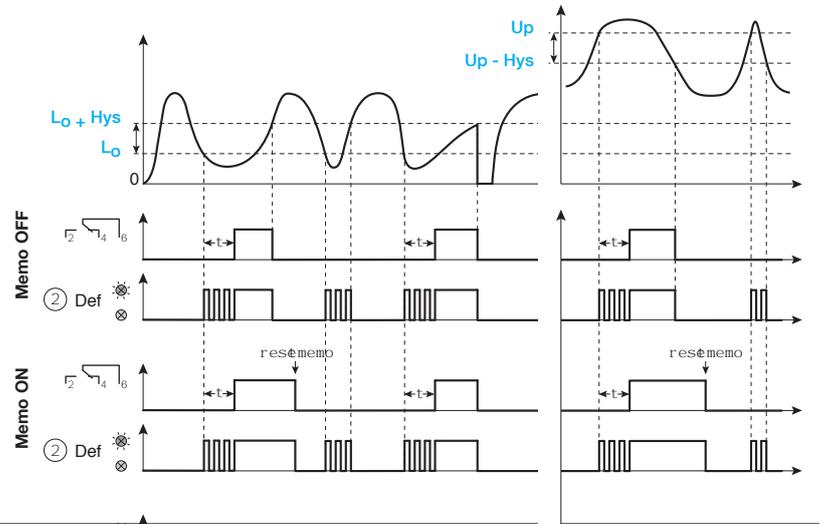
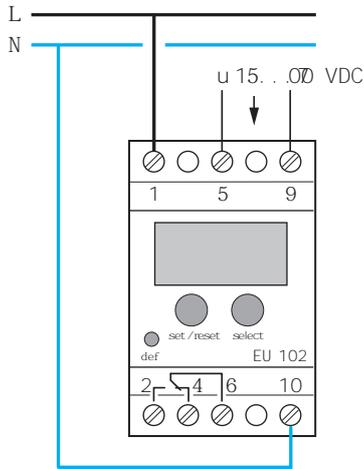
Designation	In/A	Width in I	Pack	Cat. Ref.
Voltage control relay with LCD	Power supply 230V~ 50/60 Hz Voltage monitored DC 15 to 700V or AC 15 to 480V~ Under or over voltage or both control bands Parameter setting via push button and LCD indicator Output : changeover contact 8A AC 250V~	2	1	EU102
Voltage control relay control relay	Power supply Un 400V~ 50/60 Hz Under/over voltage control Umin/Umax : +/-5% to +/-20% Un set via potentiometer Output : changeover contact 8A AC1 250V~	2	1	EU302
Current control relay single phase with LCD	Power supply Un 230V~ 50/60 Hz Current control DC or AC, direct 0.1A to 10A or via current transformer Under/ over current or both control bands Parameter setting via push button and LCD indicator Output : changeover contact 8A AC1 250V~	2	1	EU103

References	EU100	EU101	EU301	EU302	EU300	EU102	EU103
Function		single phase compressor control relay	single phase compressor control relay	three phase compressor control relay	three phase voltage control relay	phase control relay	voltage control relay with LCD current control relay with LCD
LCD indicator	No						measured voltage measured current
Power supply		230 V AC +10% -15% 50/60Hz +/-2%		230 V AC +10% -15% 50/60Hz +/-2%			230 V AC +10% -15% 50/60Hz +/-2%
Power consumption	< 5 VA						
Output contact	8A - AC1 - 250V closed : normal status opened : default status						
Disconnection time	5min / 10min						
Response time	200 ms				0,1..12s set via potentiometer	200 ms	200 ms
Monitoring function	Monitoring function over/under voltage					Monitor. funct. under voltage loss of phase	over voltage over current under current band
Monitoring levels	Umin : 0.75Un Umax : 1.2Un	Umin/Umax : +/-5% to +/-20%Un set via potentiometer		Umin : +/-5 to +/-20% Un Umax : 1.15Un	Asymmetry +/-5% to +/-20% Umin : 0.70Un	DC : 15V to 700V AC : 15V rms to 480V rms	DC : 0.1 to 10A AC : direct : 0.1to10A or via transformer : X/5
Hysteresis							5 to 50%
Latching function	No			Yes	No	Yes	
Supervised voltage	the power supply						
Width	2 modules					2 modules	
LED power supply :	lights when powered green						
LED default information :	lights in case of fault, flashing during time elapses, off during normal status red						
LED asymmetry information :						asymetry fault yellow	
Ik	3						
IP rating	IP 20						
Working temperature	-20 to +55°C						
Storage temperature	-40 to +70°C						
Connexion flexible	0.75 to 4 mm <sup>2</sup>						
rigid	1.00 to 6 mm <sup>2</sup>						

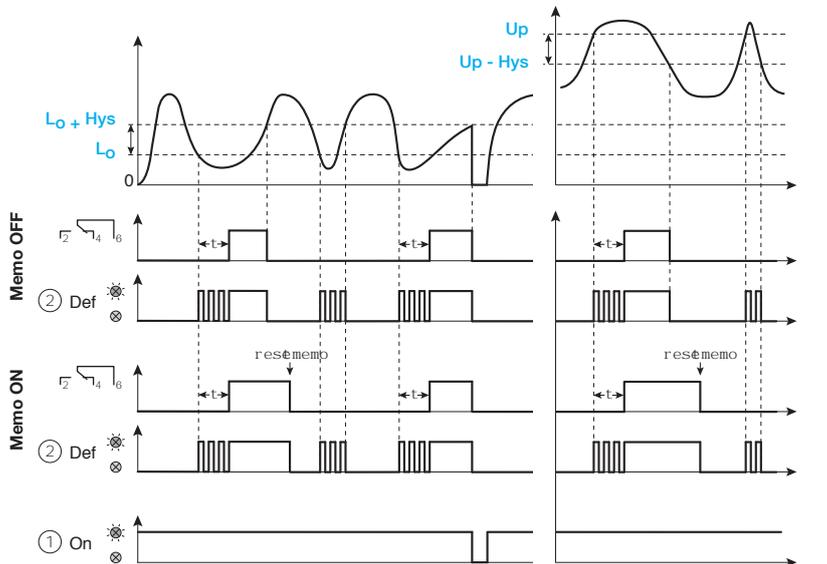
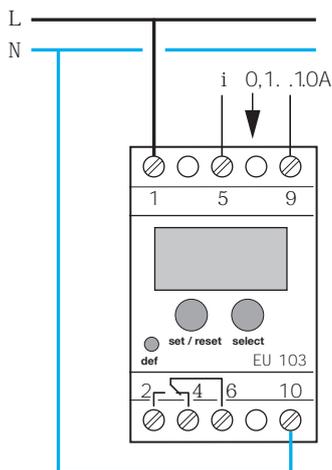
Air conditioning control relay single phase EU100



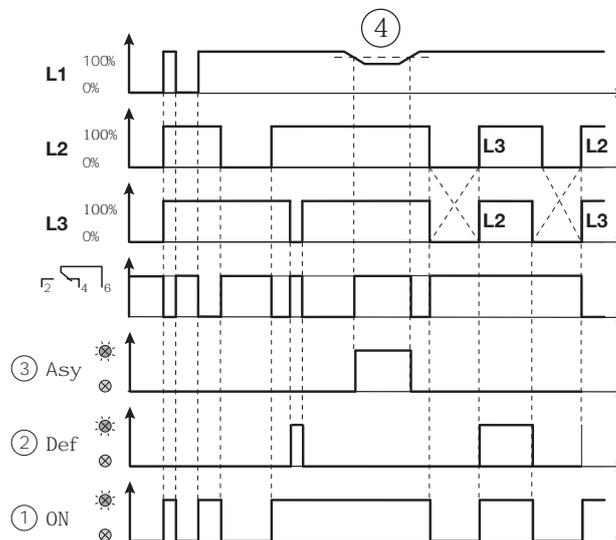
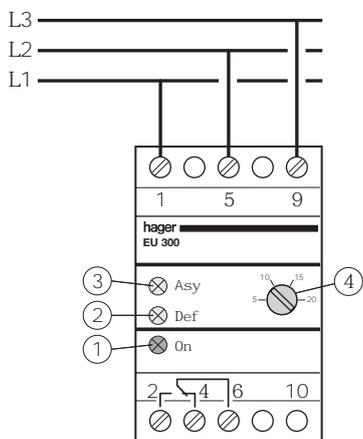
Voltage control relay single phase EU102



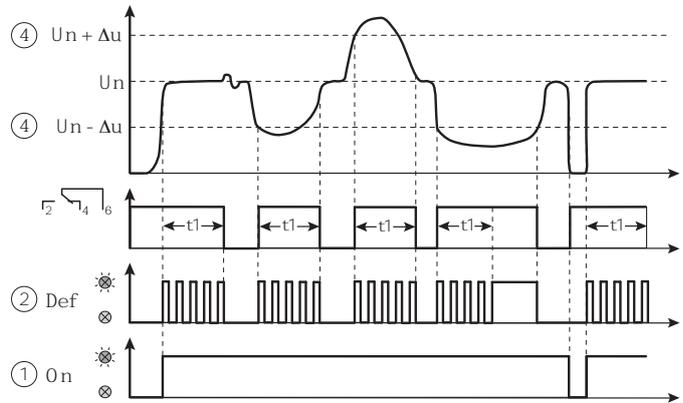
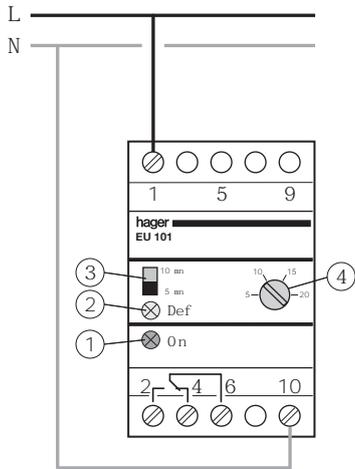
Current control relay single phase EU103



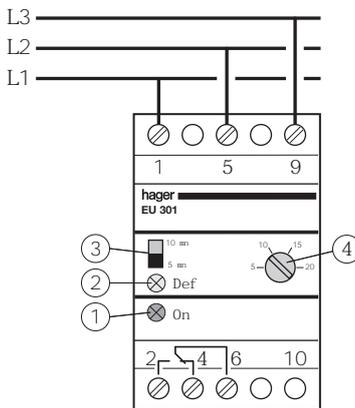
Phase control relay EU300



Air conditioning control relay single phase EU101



Air conditioning control relay three phase EU301



Voltage control relay three phase EU302

