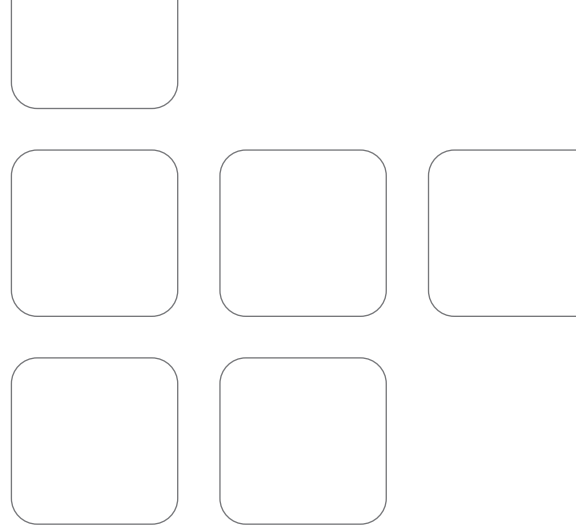


Energy  
distribution  
catalogue

Building  
automation  
catalogue





### Take your time

In all probability, things are the same for you as they are for many of us in our industry. **The demands on our business are constantly growing**, the level of complexity rises by the day and more and more challenges seem to lie in wait for us with ever-increasing frequency. As a result, when it comes to creating **taylor-made solutions** for new construction and renovation **based on the specific needs of our customers**, time is often in short supply.

But in this day and age, that is where the real opportunities lie. By offering new concepts for building automation systems, energy efficiency and the use of renewable energies, we are able to make the **day-to-day tasks of our customers safer and more comfortable** while also ensuring our business continues to develop dynamically. Hager employs more than 800 developers, who are constantly working on these solutions all around the world. In other words: we take our time to make **truly ground-breaking innovations** and intelligent technologies which are **just as quick to install as they are easy to use**. And of course, we also continue to provide you with all of the reliable products and safe solutions we have been long known for here at Hager.

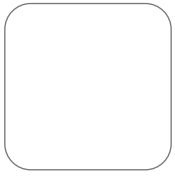
We have been doing this **for around 60 years**. And we are only as successful as we are at what we do because of the trust you continue to place in us. I would like to take this opportunity to **express our warmest thanks** to you for this continued trust in us – and to recommend that you take a good look at our new catalogue, which serves as a **practical tool for electrical engineering**.

Please do take the time to consult the catalogue every now and again. It provides a **handy overview** of all of the solutions we use not only to save you a lot of time and effort, but also to **constantly tap into new sales potential**. And just in case you have any questions: the details of the contact partner for your region can be found on back cover. They will be happy to assist you at any time. **Hager is always on your side** – as it has been for six decades and will continue to be in the electrifying future that lies ahead of us.

We at Hager look forward to **shaping this time with you**.

Best wishes,

Daniel Hager  
CEO of Hager Group



# The specialist for electrical installations

Since 1955 Hager is the specialist for electrical installations in residential and commercial sectors, as a standard you can receive everything from one source: systems and solutions with high quality, reliability and ease of installation.

## New ideas for the customers' benefit

Together with customers from industry and the electrical trade, Hager Group is working on future topics such as electro-mobility, Ambient Assisted Living, where building automation facilitates the everyday life of the elderly and individuals who require care, and on the networking

of energy-efficient housing, which will provide greater comfort while requiring less energy consumption. The link between many of these technologies will be the distribution board, the product with which the company achieved its growth.

## A leading group

The Hager brand represents the core business of Hager Group.

The company was founded in 1955 by Hermann Hager and Dr. Oswald Hager together with their father Peter and today remains an independent business, owned and run by members of the Hager family, with its head office in Blieskastel, Germany. The organisation of the company as a European Company (Societas Europaea, SE) underlines both its cultural diversity and its European roots. Hager Group is, though, a worldwide business venture: 11,400 employees and generates a turnover of around 1.6 billion euros (2013).

Highly innovative achievements provide a market edge with more than 830 employees working in R&D. With more than 5% of turnover reinvested in R&D, Hager Group filed a total of 1513 patents to date.

Components and solutions are produced in 22 production sites around the globe and customers in more than 80 countries all over the world trust in them.

Cat.ref.	Page No.	Cat.ref.	Page No.	Cat.ref.	Page No.	Cat.ref.	Page No.	Cat.ref.	Page No.
<b>AD</b>		EE825	70	ERC218	42	ESL226	43	<b>JAE</b>	
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AD120	20	EE827	70	ERC226	45	ESL240	43	JAE320	32
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AD125	20	EE840	70	ERC325	45	ESL425	44	JAE420	32
AD126	20	EE841	70	ERC416	42	ESL426	44	JAE425	32
AD127	20	EE855	70	ERC418	42	ESL427	44	JAE425S-IP55	32
AD128	20	EE856	70	ERC425	45	ESL428	44		
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AD616B	20	EE861	70	ERC427	45	ESL463	44	JAG331	32
AD620B	20	EE870	70	ERC428	45			JAG331S-IP55	32
AD625B	20	EE871	70			<b>ESM</b>		JAG340	32
AD632B	20	EE883	71	<b>ERD</b>		ESM225	43	JAG340S-IP55	32
AD640B	20			ERD216	42	ESM227	43	JAG431	32
		<b>EG</b>		ERD217	42	ESM440	44	JAG431S-IP55	32
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CD240B	19	EG103V	58	ERD263	45	HLE190S	14	<b>JAH</b>	
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CD280B	19	EG170	58	ERD418S	42	HLE280S	14	JAH363S-IP55	32
CD284B	19	EG203B	58	ERD425	45	HLE290S	14	JAH380	32
CD425B	19	EG210	58			HLE299S	14	JAH390	32
CD440B	19	EG270	58	<b>ERL</b>		HLE380S	14	JAH392	32
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CD482B	19	<b>EH</b>		ERL217	42	HLE399S	14	JAH463S-IP55	32
CD485B	19	EH010	54	ERL218	42	HLE480S	14	JAH480	32
		EH011	54	ERL225	45	HLE490S	14	JAH490	32
<b>CE</b>		EH071	54	ERL240	45	HLE499S	14	JAH492	32
CE225B	19	EH110	54	ERL263	45			<b>JG</b>	
CE240B	19	EH110A	54	ERL418	42	<b>HLF</b>		JG220IN	34
CE263B	19	EH111	54	ERL418S	42	HLF180S	14	JG220U	34
CE280B	19	EH111A	54	ERL425	45	HLF190S	14	JG232IN	34
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CE425B	19	EH191	54	<b>ESC</b>		HLF280S	14	JG240IN	34
CE440B	19	EH209	54	ESC001	46	HLF290S	14	JG240U	34
CE463B	19	EH210	54	ESC002	46	HLF299S	14	JG263IN	34
CE480B	19	EH211	54	ESC003	46	HLF380S	14	JG263U	34
CE484B	19	EH271	54	ESC080	46	HLF390S	14	JG320IN	34
		EH710	56	ESC125	43	HLF399S	14	JG320U	34
<b>CF</b>		EH710A	56	ESC126	43	HLF480S	14	JG325S	34
CF225B	19	EH711	56	ESC225	43	HLF490S	14	JG332IN	34
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CF280B	19	EH900	56	ESC227	43	<b>HZ</b>		JG380S	34
CF284B	19	EH901	54	ESC240	43	HZ021	32	JG440IN	34
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CF463B	19	<b>EN</b>		ESC264	43	HZ025	32	JG463U	34
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CF484B	19	EN146	42	ESC340	43	HZ037	32	<b>JZA</b>	
		<b>EPN</b>		ESC363	43	HZ046	32	JZA700	32
<b>CG</b>		EPN050	39	ESC425	44	HZ047	32	JZA701	32
CG225B	19	EPN051	39	ESC426	44			JZA702	32
CG240B	19	EPN052	39	ESC427	44	<b>HZC</b>			
CG263B	19	EPN053	39	ESC428	44	HZC201	32	<b>LS</b>	
CG280B	19	EPN053	39	ESC440	44	HZC202	32	LS501	23
CG284B	19	EPN501	38	ESC441	44	HZC203	32	LS502	23
CG425B	19	EPN503	38	ESC442	44	HZC204	32	LS503	23
CG440B	19	EPN510	38	ESC443	44	HZC205	32	LS504	23
CG463B	19	EPN511	38	ESC463	44	HZC206	32	LS512	23
CG480B	19	EPN512	38	ESC464	44			<b>LZ</b>	
CG484B	19	EPN513	38	ESC465	44	<b>JAB</b>		LZ060	46
		EPN515	38	ESC466	44	JAB302	32		
<b>CZ</b>		EPN516	38			JAB303	32	<b>MT</b>	
CZ001	15	EPN518	38	<b>ESD</b>		JAB306	32	MT106A	9
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CZN005	19	EPN521	38	ESD227	43	JAB310S-IP55	32	MT120A	9
CZN006	19	EPN522	38	ESD240	43	JAB402	32	MT125A	9
		EPN523	38	ESD241	43	JAB403	32	MT132A	9
<b>EE</b>		EPN524	38	ESD263	43	JAB406	32	MT140A	9
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EE003	64	EPN526	38	ESD425	44	JAB410	32	MT163A	9
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EE110	64	EPN541	38	ESD428	44	<b>JAC</b>		MT216A	9
EE170	64	EPN546	38	ESD440	44	JAC310S-IP55	32	MT220A	9
EE171	64	EPN548	38	ESD463	44	JAC312	32	MT225A	9
EE701	64			ESD464	44	JAC316	32	MT232A	9
EE702	64	<b>ERC</b>				JAC410S-IP55	32	MT240A	9
EE804	71	ERC125	45	<b>ESL</b>		JAC412	32	MT250A	9
EE805	71	ERC216	42	ESL125	43	JAC416	32		
EE806	70	ERC217	42	ESL225	43				

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MT263A	9	MY216E	8	NC150A	10	NDN350A	11	SPD065N	25
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MT320A	9	MY240E	8	NC202A	10	NDN402A	12		
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MT340A	9	MY301E	8	NC206A	10	NDN406A	12	SPM240E	26
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MT410A	9	MY306E	8	NC225A	10	NDN425A	12	SPM465E	26
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MT440A	9	MY332E	8	NC300A	10			SPN040D	25
MT450A	9	MY340E	8	NC301A	10	<b>NRN</b>		SPN040N	25
MT463A	9	MY350E	8	NC302A	10	NRN100	13	SPN040R	25
		MY363E	8	NC303A	10	NRN101	13	SPN065R	25
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MU102A	9	<b>MZ</b>		NC306A	10	NRN103	13	SPN165R	24
MU104A	9	MZ201	15	NC310A	10	NRN104	13	SPN215R	25
MU106A	9	MZ202	15	NC316A	10	NRN106	13	SPN240R	25
MU110A	9	MZ203	15	NC320A	10	NRN110	13	SPN265R	24
MU116A	9	MZ204	15	NC325A	10	NRN116	13	SPN415D	25
MU120A	9	MZ205	15	NC332A	10	NRN120	13	SPN415R	25
MU125A	9	MZ206	15	NC340A	10	NRN125	13	SPN440D	25
MU132A	9	MZ209	15	NC350A	10	NRN132	13	SPN440R	25
MU140A	9	MZ214	15	NC363A	10	NRN140	13	SPN465R	24
MU150A	9			NC400A	10	NRN150	13		
MU163A	9	<b>MZN</b>		NC401A	10	NRN163	13	<b>SPV</b>	
MU202A	9	MZN175	15	NC402A	10	NRN200	13	SPV025	25
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MU206A	9			NC404A	10	NRN202	13		
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MU216A	9	NB106A	10	NC410A	10	NRN204	13	SVN121	61
MU220A	9	NB110A	10	NC416A	10	NRN206	13	SVN122	61
MU225A	9	NB116A	10	NC420A	10	NRN210	13	SVN123	61
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MU306A	9	NB206A	10	<b>NDN</b>		NRN263	13	SVN131	61
MU310A	9	NB210A	10	NDN100A	11	NRN300	13	SVN132	61
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MU332A	9	NB232A	10	NDN104A	11	NRN304	13	SVN136	61
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MU363A	9	NB263A	10	NDN116A	11	NRN316	13	SVN311	62
MU402A	9	NB306A	10	NDN120A	11	NRN320	13	SVN312	62
MU404A	9	NB310A	10	NDN125A	11	NRN325	13	SVN321	62
MU406A	9	NB316A	10	NDN132A	11	NRN332	13	SVN322	62
MU410A	9	NB320A	10	NDN140A	11	NRN340	13	SVN331	62
MU416A	9	NB325A	10	NDN150A	11	NRN350	13	SVN332	62
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MY163E	8	NC110A	10	NDN310A	11	SM202	66		
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MY206E	8	NC140A	10	NDN340A	11	SPD040N	25		
MY210E	8								

# Protection devices

## the complete solution

Hager offers a wide range of protection devices, such as miniature circuit breakers, auxiliaries and accessories, 2 and 4 pole RCCBs, RCCB auxiliaries, RCBOs, HRC fuse carriers



Miniature circuit breakers	08-14
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Auxiliaries and accessories for MCBs & RCCBs	15
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2 & 4 pole residual current devices	19
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Combined MCB/ RCD (RCBO) 6kA	20
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RCBO electronic	20
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HRC fuse carriers	23
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Surge protective devices type 2	24
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Surge protective devices for general protection	25
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Replacement cartridges for SPDs with plug in cartridge	25
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Monobloc surge protection devices	26
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Enclosed load break switches 20-1600A	32
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IP66 isola	34



**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 IEC 60 898  
6kA IEC 60 947-2  
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.

**Approval :**

KEMA  
ST, SNI, LMK

	Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref
 <p>MY106E</p>	<p><b>Single pole MCB</b></p> 	1	1	12	<b>MY101E</b>
		2	1	12	<b>MY102E</b>
		3	1	12	<b>MY103E</b>
		4	1	12	<b>MY104E</b>
		6	1	12	<b>MY106E</b>
		10	1	12	<b>MY110E</b>
		16	1	12	<b>MY116E</b>
		20	1	12	<b>MY120E</b>
		25	1	12	<b>MY125E</b>
		32	1	12	<b>MY132E</b>
		40	1	12	<b>MY140E</b>
		50	1	12	<b>MY150E</b>
		63	1	12	<b>MY163E</b>
 <p>MY232E</p>	<p><b>Double pole MCB</b></p> 	1	2	6	<b>MY201E</b>
		2	2	6	<b>MY202E</b>
		3	2	6	<b>MY203E</b>
		4	2	6	<b>MY204E</b>
		6	2	6	<b>MY206E</b>
		10	2	6	<b>MY210E</b>
		16	2	6	<b>MY216E</b>
		20	2	6	<b>MY220E</b>
		25	2	6	<b>MY225E</b>
		32	2	6	<b>MY232E</b>
		40	2	6	<b>MY240E</b>
		50	2	6	<b>MY250E</b>
		63	2	6	<b>MY263E</b>
 <p>MY316</p>	<p><b>Triple pole MCB</b></p> 	1	3	4	<b>MY301E</b>
		2	3	4	<b>MY302E</b>
		3	3	4	<b>MY303E</b>
		4	3	4	<b>MY304E</b>
		6	3	4	<b>MY306E</b>
		10	3	4	<b>MY310E</b>
		16	3	4	<b>MY316E</b>
		20	3	4	<b>MY320E</b>
		25	3	4	<b>MY325E</b>
		32	3	4	<b>MY332E</b>
		40	3	4	<b>MY340E</b>
		50	3	4	<b>MY350E</b>
		63	3	4	<b>MY363E</b>

**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 IEC 60 898 and BSEN 60-898

Reference calibration  
 Temperature : 30°C

**Breaking capacity :**

6kA IEC 60 898  
 10kA IEC 60 947-2  
 22KAIC NEMA AB-1  
 Voltage rating : 230/400V  
 Current rating : 2-63A  
 Mechanical endurance :  
 20 000 operations



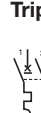
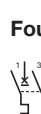
**Connection capacity :**

25mm<sup>2</sup> rigid conductor  
 16mm<sup>2</sup> flexible conductor

Will accept accessories, shunt trips, auxiliary contact.

**Approval :**

KEMA  
 SNI  
 LMK

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref. B curve	Cat. Ref. C curve
 <p><b>Single pole MCB</b></p>	2	1	12	-	<b>MU102A</b>
	4	1	12	-	<b>MU104A</b>
	6	1	12	<b>MT106A</b>	<b>MU106A</b>
	10	1	12	<b>MT110A</b>	<b>MU110A</b>
	16	1	12	<b>MT116A</b>	<b>MU116A</b>
	20	1	12	<b>MT120A</b>	<b>MU120A</b>
	25	1	12	<b>MT125A</b>	<b>MU125A</b>
	32	1	12	<b>MT132A</b>	<b>MU132A</b>
	40	1	12	<b>MT140A</b>	<b>MU140A</b>
	50	1	12	<b>MT150A</b>	<b>MU150A</b>
	63	1	12	<b>MT163A</b>	<b>MU163A</b>
 <p><b>Double pole MCB</b></p>	2	2	6	-	<b>MU202A</b>
	4	2	6	-	<b>MU204A</b>
	6	2	6	<b>MT206A</b>	<b>MU206A</b>
	10	2	6	<b>MT210A</b>	<b>MU210A</b>
	16	2	6	<b>MT216A</b>	<b>MU216A</b>
	20	2	6	<b>MT220A</b>	<b>MU220A</b>
	25	2	6	<b>MT225A</b>	<b>MU225A</b>
	32	2	6	<b>MT232A</b>	<b>MU232A</b>
	40	2	6	<b>MT240A</b>	<b>MU240A</b>
	50	2	6	<b>MT250A</b>	<b>MU250A</b>
	63	2	6	<b>MT263A</b>	<b>MU263A</b>
 <p><b>Triple pole MCB</b></p>	2	3	4	-	<b>MU302A</b>
	4	3	4	-	<b>MU304A</b>
	6	3	4	<b>MT306A</b>	<b>MU306A</b>
	10	3	4	<b>MT310A</b>	<b>MU310A</b>
	16	3	4	<b>MT316A</b>	<b>MU316A</b>
	20	3	4	<b>MT320A</b>	<b>MU320A</b>
	25	3	4	<b>MT325A</b>	<b>MU325A</b>
	32	3	4	<b>MT332A</b>	<b>MU332A</b>
	40	3	4	<b>MT340A</b>	<b>MU340A</b>
	50	3	4	<b>MT350A</b>	<b>MU350A</b>
	63	3	4	<b>MT363A</b>	<b>MU363A</b>
 <p><b>Four pole MCB</b></p>	2	3	4	-	<b>MU402A</b>
	4	3	4	-	<b>MU404A</b>
	6	3	4	<b>MT406A</b>	<b>MU406A</b>
	10	3	4	<b>MT410A</b>	<b>MU410A</b>
	16	3	4	<b>MT416A</b>	<b>MU416A</b>
	20	3	4	<b>MT420A</b>	<b>MU420A</b>
	25	3	4	<b>MT425A</b>	<b>MU425A</b>
	32	3	4	<b>MT432A</b>	<b>MU432A</b>
	40	3	4	<b>MT440A</b>	<b>MU440A</b>
	50	3	4	<b>MT450A</b>	<b>MU450A</b>
	63	3	4	<b>MT463A</b>	<b>MU463A</b>



MU106A



MT240A



MT316A



MU463A

**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 IEC 60 898  
15kA according to IEC 60 947-2  
  
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.

**Connection capacity**

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



NB110A      NC110A

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	-	<b>NC100A</b>
	1	1	12	-	<b>NC101A</b>
	2	1	12	-	<b>NC102A</b>
	3	1	12	-	<b>NC103A</b>
	4	1	12	-	<b>NC104A</b>
	6	1	12	<b>NB106A</b>	<b>NC106A</b>
	10	1	12	<b>NB110A</b>	<b>NC110A</b>
	16	1	12	<b>NB116A</b>	<b>NC116A</b>
	20	1	12	<b>NB120A</b>	<b>NC120A</b>
	25	1	12	<b>NB125A</b>	<b>NC125A</b>
	32	1	12	<b>NB132A</b>	<b>NC132A</b>
	40	1	12	<b>NB140A</b>	<b>NC140A</b>
	50	1	12	<b>NB150A</b>	<b>NC150A</b>
	63	1	12	<b>NB163A</b>	<b>NC163A</b>



NC210A

<b>Double pole MCB</b>	0.5	2	6	-	<b>NC200A</b>
	1	2	6	-	<b>NC201A</b>
	2	2	6	-	<b>NC202A</b>
	3	2	6	-	<b>NC203A</b>
	4	2	6	-	<b>NC204A</b>
	6	2	6	<b>NB206A</b>	<b>NC206A</b>
	10	2	6	<b>NB210A</b>	<b>NC210A</b>
	16	2	6	<b>NB216A</b>	<b>NC216A</b>
	20	2	6	<b>NB220A</b>	<b>NC220A</b>
	25	2	6	<b>NB225A</b>	<b>NC225A</b>
	32	2	6	<b>NB232A</b>	<b>NC232A</b>
	40	2	6	<b>NB240A</b>	<b>NC240A</b>
	50	2	6	<b>NB250A</b>	<b>NC250A</b>
	63	2	6	<b>NB263A</b>	<b>NC263A</b>



NC310A

<b>Triple pole MCB</b>	0.5	3	4	-	<b>NC300A</b>
	1	3	4	-	<b>NC301A</b>
	2	3	4	-	<b>NC302A</b>
	3	3	4	-	<b>NC303A</b>
	4	3	4	-	<b>NC304A</b>
	6	3	4	<b>NB306A</b>	<b>NC306A</b>
	10	3	4	<b>NB310A</b>	<b>NC310A</b>
	16	3	4	<b>NB316A</b>	<b>NC316A</b>
	20	3	4	<b>NB320A</b>	<b>NC320A</b>
	25	3	4	<b>NB325A</b>	<b>NC325A</b>
	32	3	4	<b>NB332A</b>	<b>NC332A</b>
	40	3	4	<b>NB340A</b>	<b>NC340A</b>
	50	3	4	<b>NB350A</b>	<b>NC350A</b>
	63	3	4	<b>NB363A</b>	<b>NC363A</b>



NB410A

<b>Four pole MCB</b>	0.5	4	3	-	<b>NC400A</b>
	1	4	3	-	<b>NC401A</b>
	2	4	3	-	<b>NC402A</b>
	3	4	3	-	<b>NC403A</b>
	4	4	3	-	<b>NC404A</b>
	6	4	3	<b>NB406A</b>	<b>NC406A</b>
	10	4	3	<b>NB410A</b>	<b>NC410A</b>
	16	4	3	<b>NB416A</b>	<b>NC416A</b>
	20	4	3	<b>NB420A</b>	<b>NC420A</b>
	25	4	3	<b>NB425A</b>	<b>NC425A</b>
	32	4	3	<b>NB432A</b>	<b>NC432A</b>
	40	4	3	<b>NB440A</b>	<b>NC440A</b>
	50	4	3	<b>NB450A</b>	<b>NC450A</b>
	63	4	3	<b>NB463A</b>	<b>NC463A</b>



**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 IEC 60 898

**Breaking capacity :**

10kA according to IEC 60 898  
 15kA according to IEC 60 947-2  
 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 trippers, auxiliary contact.

**Connection capacity**

25mm<sup>2</sup> rigid conductor  
 16mm<sup>2</sup> flexible conductor



NDN116A

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



NDN 232A

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref.
<b>Double pole MCB</b>				
	0.5	2	6	<b>NDN200A</b>
	1	2	6	<b>NDN201A</b>
	2	2	6	<b>NDN202A</b>
	3	2	6	<b>NDN203A</b>
	4	2	6	<b>NDN204A</b>
	6	2	6	<b>NDN206A</b>
	10	2	6	<b>NDN210A</b>
	16	2	6	<b>NDN216A</b>
	20	2	6	<b>NDN220A</b>
	25	2	6	<b>NDN225A</b>
	32	2	6	<b>NDN232A</b>
	40	2	6	<b>NDN240A</b>
	50	2	6	<b>NDN250A</b>
	63	2	6	<b>NDN263A</b>



NDN320A

Designation	In/A	Width in 17.5mm	Pack qty.	Cat. Ref.
<b>Triple pole MCB</b>				
	0.5	3	4	<b>NDN300A</b>
	1	3	4	<b>NDN301A</b>
	2	3	4	<b>NDN302A</b>
	3	3	4	<b>NDN303A</b>
	4	3	4	<b>NDN304A</b>
	6	3	4	<b>NDN306A</b>
	10	3	4	<b>NDN310A</b>
	16	3	4	<b>NDN316A</b>
	20	3	4	<b>NDN320A</b>
	25	3	4	<b>NDN325A</b>
	32	3	4	<b>NDN332A</b>
	40	3	4	<b>NDN340A</b>
	50	3	4	<b>NDN350A</b>
	63	3	4	<b>NDN363A</b>

# 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.
<b>Four pole MCB</b>	0.5	4	3	<b>NDN400A</b>
	1	4	3	<b>NDN401A</b>
	2	4	3	<b>NDN402A</b>
	3	4	3	<b>NDN403A</b>
	4	4	3	<b>NDN404A</b>
	6	4	3	<b>NDN406A</b>
	10	4	3	<b>NDN410A</b>
	13	4	3	<b>NDN413A</b>
	16	4	3	<b>NDN416A</b>
	20	4	3	<b>NDN420A</b>
	25	4	3	<b>NDN425A</b>
	32	4	3	<b>NDN432A</b>
	40	4	3	<b>NDN440A</b>
	50	4	3	<b>NDN450A</b>
63	4	3	<b>NDN463A</b>	



**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 applications.

**Connection capacity**  
16mm<sup>2</sup> flexible conductor  
25mm<sup>2</sup> rigid conductor  
Complies with IEC 60 947-2

**Accessories**  
- RCDs add-on blocks  
- Auxiliaries



NRN116

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



NRN232

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



NRN320

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



NRN440

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

Curves "B" and "C" 10000

IEC 60898-1

10 kA

IEC 60 947-2

In 80 to 125 A

Tripping curves :

"B" magnetic setting between 3 and 5 In

"C" magnetic setting between 5 and 10 In

Use :

Residential, commercial and industrial premises

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 60 898-1, 947-2 approved

Designation	In / A	Width in 17.5 mm	Cat. Ref. curve B	Cat. Ref. curve C
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**Circuit breakers 1 pole**



HLF199S



80	1.5	<b>HLE180S</b>	<b>HLF180S</b>
100	1.5	<b>HLE190S</b>	<b>HLF190S</b>
125	1.5	<b>HLE199S</b>	<b>HLF199S</b>

**Circuit breakers 2 pole**



HLF299F



80	3	<b>HLE280S</b>	<b>HLF280S</b>
100	3	<b>HLE290S</b>	<b>HLF290S</b>
125	3	<b>HLE299S</b>	<b>HLF299S</b>

**Circuit breakers 3 pole**



HLF399S



80	4.5	<b>HLE380S</b>	<b>HLF380S</b>
100	4.5	<b>HLE390S</b>	<b>HLF390S</b>
125	4.5	<b>HLE399S</b>	<b>HLF399S</b>

**Circuit breakers 4 pole**



HLF499S









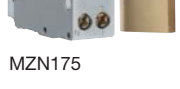



80	6	<b>HLE480S</b>	<b>HLF480S</b>
100	6	<b>HLE490S</b>	<b>HLF490S</b>
125	6	<b>HLE499S</b>	<b>HLF499S</b>

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.

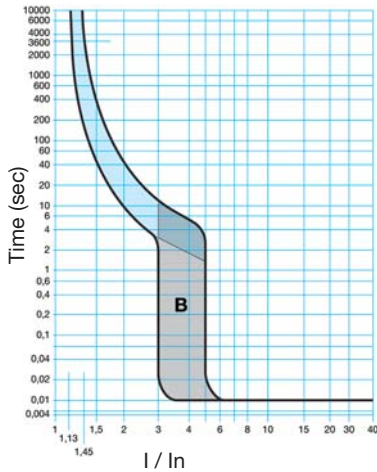
Test mode for CZ001, MZ201, MZ202 : possible to test cabling of auxiliary circuits operation by tripping-over contacts manually. Resetting of contact occurs simultaneously with MCB/RCCB resetting.

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.

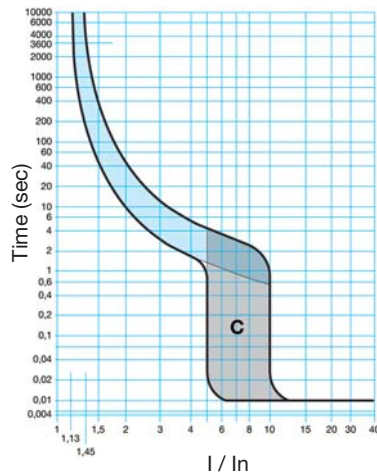
	Designation	Description	Width in 17.5mm	Pack qty.	Cat. Ref.
 MZ201	<b>Auxiliary + alarm switch for RCCB</b>	1 module wide for ON/OFF & trip indication	1	1	<b>CZ001</b>
	<b>Auxiliary contacts</b> 6A - 230V~ 3A - 440V~ Allows remote indication of main contact status.	1NO + 1NC auxiliary contact	1/2	1	<b>MZ201</b>
					
 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	<b>MZ202</b>
					
 MZ203	<b>Shunt trip</b> Allows remote tripping of the device	230 - 415 Vac 110 - 130 Vdc	1	1	<b>MZ203</b>
		24 - 48 Vac 12 - 48 Vdc	1	1	<b>MZ204</b>
					
 MZ205	<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	<b>MZ205</b> <b>MZ206</b>
					
 MZ209	<b>Overvoltage auxiliary</b> Protects the installation from permanent overvoltage	230 Vac	1	1	<b>MZ209</b>
	<b>Combined Over &amp; Under-voltage auxiliary</b> Protects the installation from permanent over and under voltage	230 Vac	1	1	<b>MZ214</b>
 MZN175	<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	<b>MZN175</b>



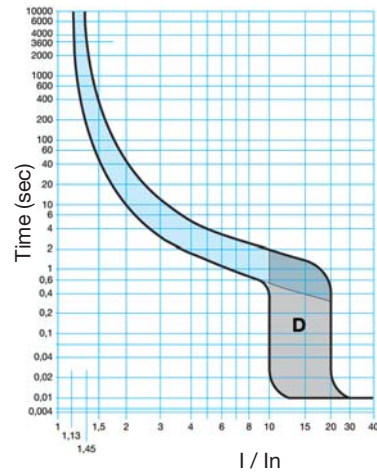
Type "B" curve



Type "C" curve



Type "D" curve



Electrical characteristics

MCB type	MY__E	MT__A	MU__A	NB__A	NC__A	NDN__A	NRN	HLE/F
Current rating	1 - 63A	6 - 63A	2 - 63A	6 - 63A	0.5 - 63A	0.5 - 63A	6 - 63A	80-125A
Tripping curve								
B: 3 - 5In								
C: 5 - 10In	C	B	C	B	C	D	C	B / C
D: 10 - 20In								
Breaking capacity								
EN 60 898 & IEC 898	4.5kA	6kA	6kA	10kA	10kA	10kA	-	10kA
IEC 947 - 2	6kA	10kA	10KA	15kA	15kA	15KA	15/25kA	10kA
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	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

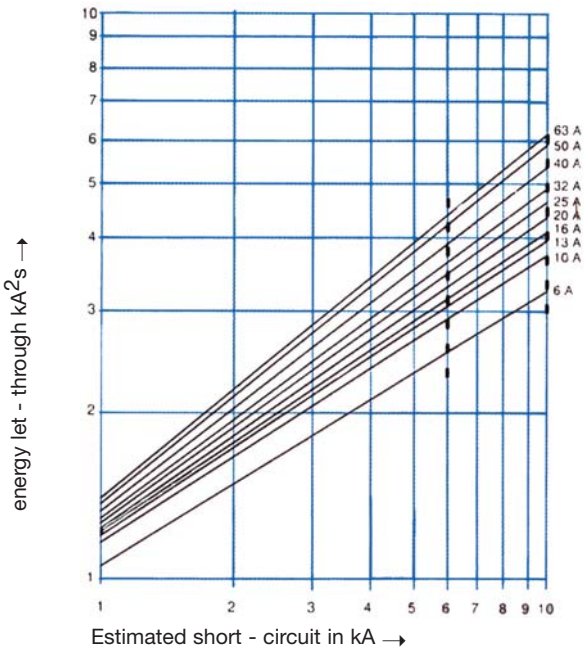
F (Hz)	17Hz - 60Hz	100Hz	200Hz	400Hz
K	1	1.1	1.2	1.5

Installation

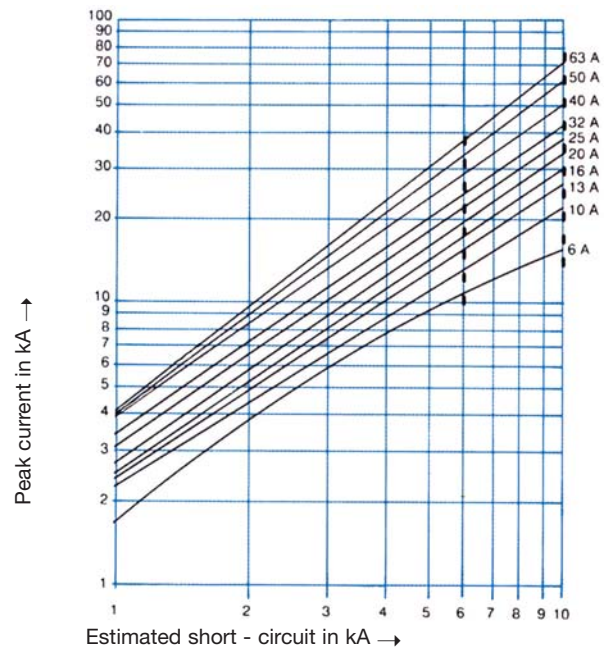
Working position : vertically, horizontally or flat.

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 tripping
	1 poles in series/60V	2 poles in series/250V	4 poles in 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
NDN	15kA	15kA	15kA	13 - 28In
NRN	20kA	20kA	20kA	5 - 15In
HLE	10kA	10kA	10kA	3 - 7.5In
HLF	10kA	10kA	10kA	5 - 15In

**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**

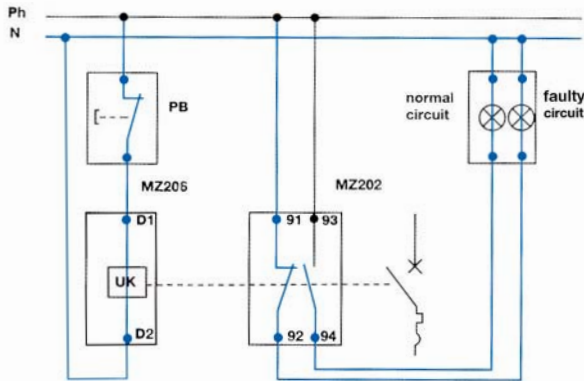
Allows tripping of the device by feeding the coil. It is fitted with internal contacts which allow it to be fed by an impulse or latched feed.

The contacts also allow for remote indication of operation.

**MZN205 / MZN206 under voltage release**

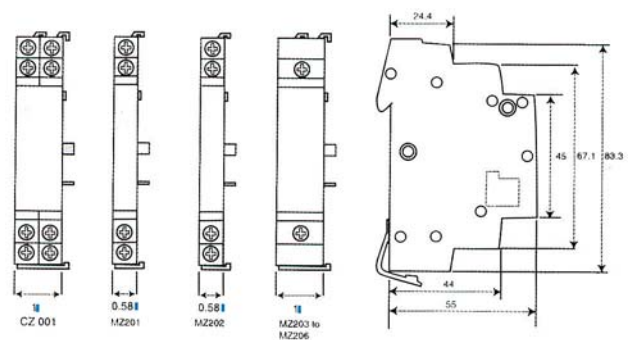
Allows the MCB to trip when the voltage drops or by pressing a remote off switch (ie emergency stop).

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 1O + 1C				
	230V~ 6A	230V~ 6A	230V~ 6A				
	440V~ 3A	440V~ 3A	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**

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 IΔn	Current	Pack qty.	Cat.Ref. 2 poles	Pack qty.	Cat. Ref. 4 poles
<b>High sensitivity</b>	30mA	16A	1	<b>CD216B</b>	-	-
		25A	1	<b>CD225B</b>	1	<b>CD425B</b>
		40A	1	<b>CD240B</b>	1	<b>CD440B</b>
		63A	1	<b>CD263B</b>	1	<b>CD463B</b>
		80A	1	<b>CD280B</b>	1	<b>CD482B</b>
		100A	1	<b>CD284B</b>	1	<b>CD485B</b>
<b>Medium sensitivity</b>	100mA	25A	1	<b>CE225B</b>	1	<b>CE425B</b>
		40A	1	<b>CE240B</b>	1	<b>CE440B</b>
		63A	1	<b>CE263B</b>	1	<b>CE463B</b>
		80A	1	<b>CE280B</b>	1	<b>CE480B</b>
		100A	1	<b>CE284B</b>	1	<b>CE484B</b>
<b>Low sensitivity</b>	300mA	25A	1	<b>CF225B</b>	1	<b>CF425B</b>
		40A	1	<b>CF240B</b>	1	<b>CF440B</b>
		63A	1	<b>CF263B</b>	1	<b>CF463B</b>
		80A	1	<b>CF280B</b>	1	<b>CF480B</b>
		100A	1	<b>CF284B</b>	1	<b>CF484B</b>
<b>Low sensitivity</b>	500mA	25A	1	<b>CG225B</b>	1	<b>CG425B</b>
		40A	1	<b>CG240B</b>	1	<b>CG440B</b>
		63A	1	<b>CG263B</b>	1	<b>CG463B</b>
		80A	1	<b>CG280B</b>	1	<b>CG480B</b>
		100A	1	<b>CG284B</b>	1	<b>CG484B</b>
<b>Terminal cover kit</b> (1 set = 2 covers)		for RCCBs 2I		16 to 63A	10 sets	<b>CZN005</b>
		for RCCBs 4I		16 to 63A	10 sets	<b>CZN006</b>
		for RCCBs 2I		80 to 100A	10 sets	<b>CZ007</b>
		for RCCBs 4I		80 to 100A	10 sets	<b>CZ008</b>
<b>Locking kit :</b>					1	<b>MZN175</b>

**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 IEC 61 009-1  
10kA IEC 60 947-2

Type AC

**Connection capacity**

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



AD616B

Designation	Sensitivity IDn	In/A	Breaking capacity	Width in ■ 17.5mm	Pack qty.	Cat. Ref. type C
<b>RCBO 1P+N</b>	30mA	10	6kA	2	1	<b>AD610B</b>
		16		2	1	<b>AD616B</b>
		20		2	1	<b>AD620B</b>
		25		2	1	<b>AD625B</b>
		32		2	1	<b>AD632B</b>
		40		2	1	<b>AD640B</b>

RCBO electronic

**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 IEC 61 009-2

**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 700mm



AD110

Sensitivity IΔn mA	Breaking capacity	In/A	Width in ■ 17.5mm	Pack qty.	Cat. Ref. type C
<b>30mA</b>	6kA	6A	1	1	<b>AD119</b>
		10A	1	1	<b>AD120</b>
		16A	1	1	<b>AD122</b>
		20A	1	1	<b>AD123</b>
		25A	1	1	<b>AD124</b>
		32A	1	1	<b>AD125</b>
		40A	1	1	<b>AD126</b>
		45A	1	1	<b>AD127</b>
		50A	1	1	<b>AD128</b>

**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.

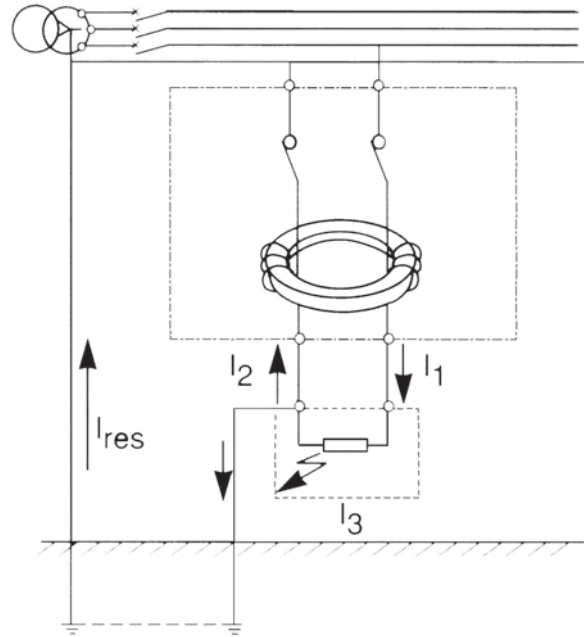
**Whole ring circuit**

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 conductor 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.

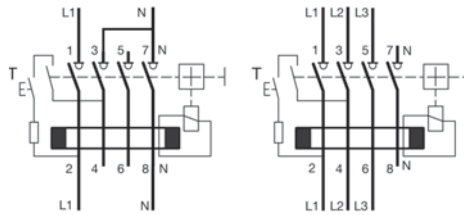
The provision of residual current protection throughout a system or in vulnerable parts of a system will greatly reduce the hazard of fire caused by such faults.

**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).

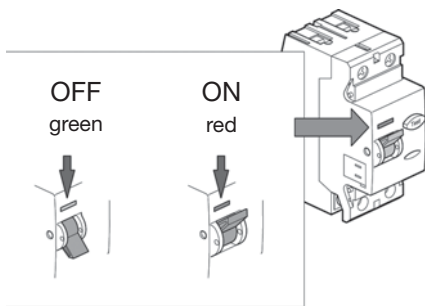


Supply entry  
Top or bottom feed.

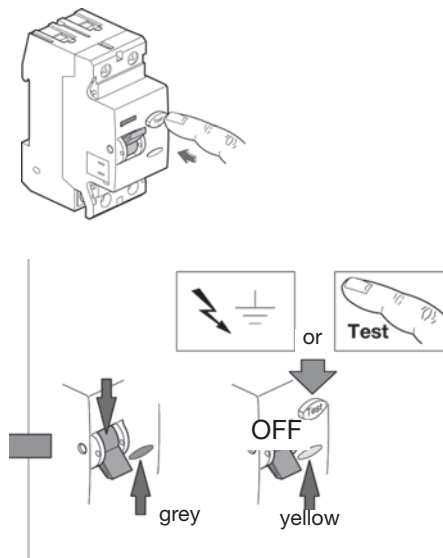
**RCCBs /MCBs co-ordination**

RCCBs	with MCBs				
	MY	MT/MU	NB/ HLE	NC/ HLF	NDN
	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	10kA
25A	4.5kA	6kA	10kA	10kA	10kA
40A	4.5kA	6kA	10kA	10kA	10kA
63A	4.5kA	6kA	10kA	10kA	10kA
80A	4.5kA	6kA	10kA	10kA	10kA
100A	4.5kA	6kA	10kA	10kA	10kA
<b>4 poles</b>					
16A	4.5kA	6kA	10kA	10kA	10kA
25A	4.5kA	6kA	10kA	10kA	10kA
40A	4.5kA	6kA	10kA	10kA	10kA
63A	4.5kA	6kA	10kA	10kA	10kA
80A	4.5kA	6kA	10kA	10kA	10kA
100A	4.5kA	6kA	10kA	10kA	10kA

**Positive contact indication**



TEST : test regularly : RCCB must trip.



**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 IEC 60 269-2, 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	<b>LS501</b>
	1P + N	2	12	<b>LS512</b>
	2P	2	6	<b>LS502</b>
	3P	3	6	<b>LS503</b>
	3P + N	4	3	<b>LS504</b>
	1P with indicating light	1	12	<b>LS531</b>



**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.



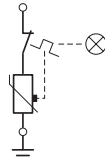
The cartridge allows simple replacement without the need to cut-off the power supply


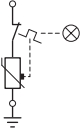

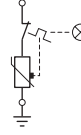
- SPDs are equipped with integrated thermic and dynamic disconnection

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



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

## 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

	Designation	Characteristics	Cat Ref..
 <p>SPN065R</p>	<p><b>Replacement cartridges</b></p>	<b>Phase for :</b> SPN265R, SPN465R	<b>SPN065R</b>
		SPN140C	<b>SPN040C</b>
		SPN240R, SPN440R	<b>SPN040R</b>
		SPD140D, SPD240D, SPD440D	<b>SPD040D</b>
		SPN215R, SPN415R	<b>SPN015R</b>
		SPD215D, SPD415D	<b>SPD015D</b>
 <p>SPN065N</p>	<p><b>Remark :</b> For a replacement of cartridges, choose only the same reference as the previous cartridge.</p>	<b>Neutral for:</b> SPN 265R, SPN465R,	<b>SPN065N</b>
		SPN240R, SPN440R, SPN215R, SPN415R SPDxxxD	<b>SPN040N</b>
			<b>SPD040N</b>
	<b>Cartridge for photovoltaic SPDs</b> Ucpv ≤ 1000V DC	polarized +/- for SPV325 earth for SPV325	<b>SPV025</b> <b>SPV025E</b>

### 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 disconnect and clearly indicates with a visual indication window.

### Connection capacity:

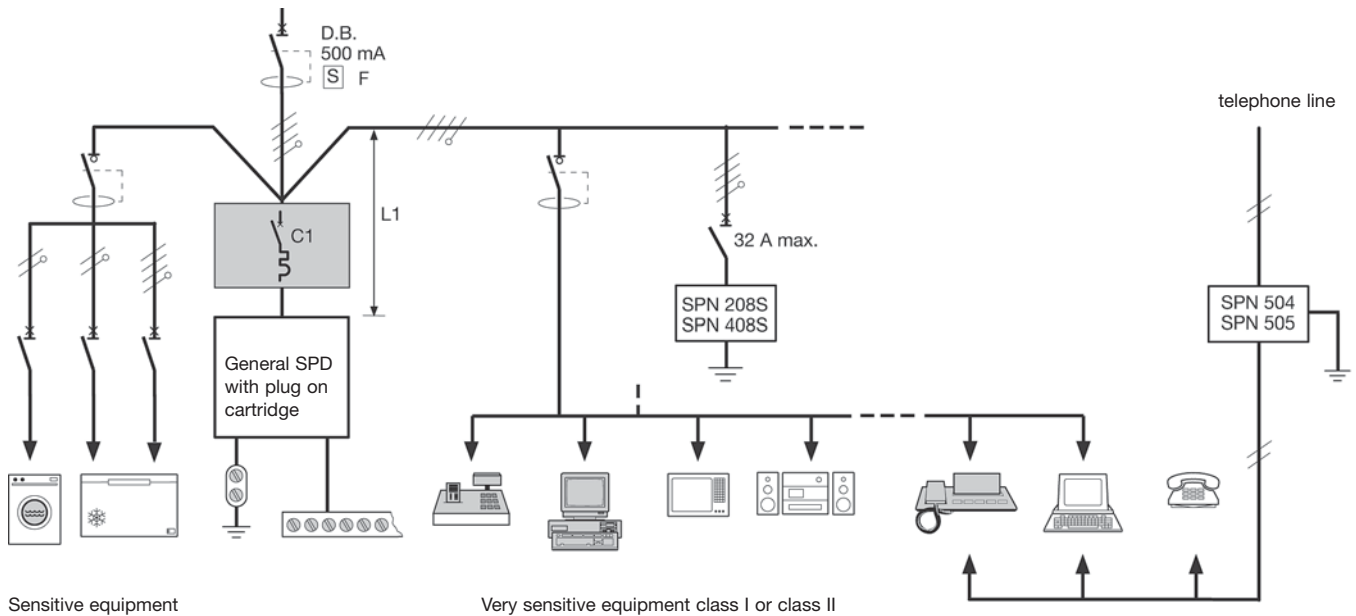
- 25mm<sup>2</sup> flexible cables
- 35mm<sup>2</sup> rigid cables

SPDs are approved according to IEC/EN 61643



	Designation	Characteristics	Width in 17.5mm	Pack qty	Cat. Ref.
 <p>SPM240E</p>	<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>
 <p>SPM440E</p>	<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>
 <p>SPM440E</p>	<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>

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 selection (with time delay) to avoid nuisance tripping.

Choice of disconnection device

The chosen 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 thermal and dynamic disconnection device LED on front indicates the good working of the device :

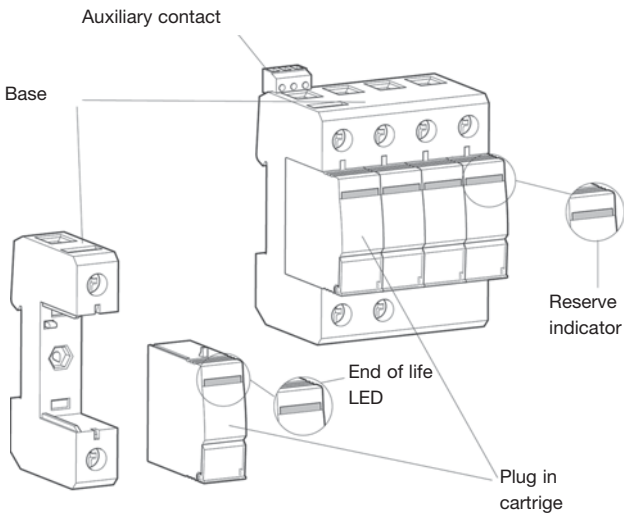
- For normal version :  
Green = OK      Red = replacement
- For version with reserve indicator :  
Green = OK      Yellow = caution      Red = replacement
- For version with electric LED for SPDs for fine protection  
Green = OK      LED off = replacement

**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



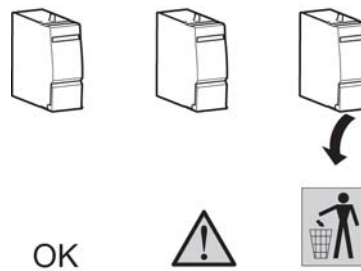
Neutral plug in cartridges can not be fitted in slots for phase cartridges and visa versa

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

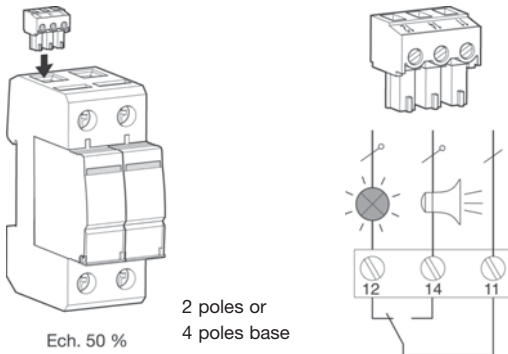
With reserve indicator



End of live LED



## Auxiliary contact for signalling and remote monitoring

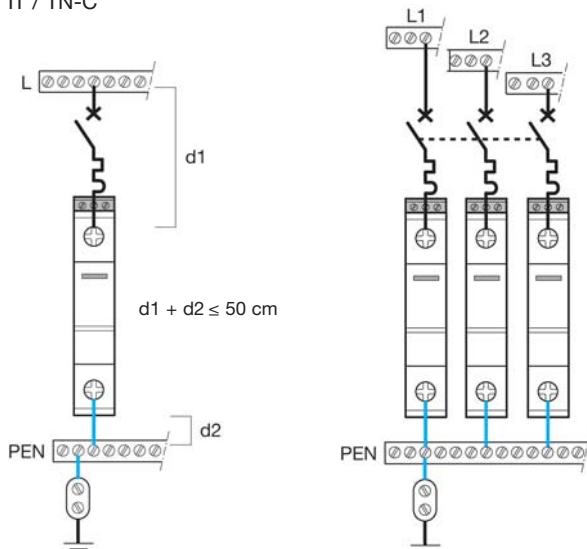


Auxiliary contact connection capacity	mini maxi	0,5 mm <sup>2</sup> 1.5 mm <sup>2</sup>	
Remote signalling	voltage nominal current	230 V~ 1 A	250 V ... 0,1 A

## Connection diagrams

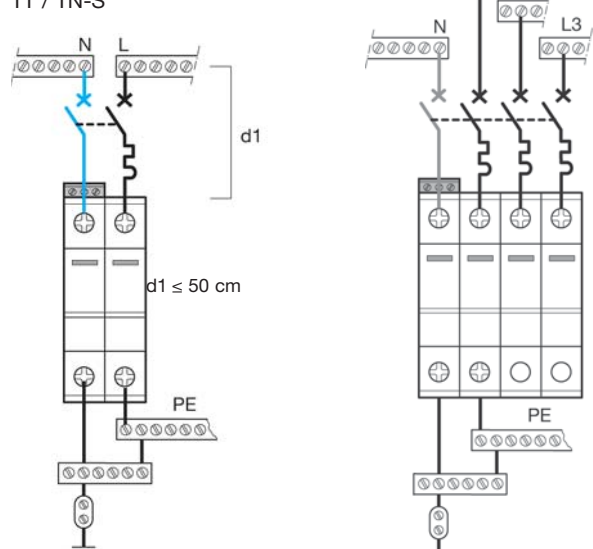
Single pole SPDs : SPN1xx - SPD1xx  
Protection only in common mode

### 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 secondary SPDs (fine protection)

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 Imax	15 kA 40 kA	15 kA 40 kA
Degree of protection		IP 20	IP 20
Short circuit resistance Icc (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 Imax	20 kA 65 kA	15 kA 40 kA	5 kA 15 kA
Degree of protection		IP 20		
Short circuit resistance Icc	(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		

# Switch disconnectors



**The advantages for you :**

- Easy to install
- Positives action door handle
- Lockable off

**Technical data :**

- IEC 60947-3
- Robust 1.2 mm steel enclosure

# Expert tips

1



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

3



Lockable off

2



Robust 1.2 mm steel enclosure

4



Terminal cover



## Description

The range of enclosed FBS have been designed to match the TP& N range of distribution boards. The number of enclosure sizes have been optimized, to ensure an easy installation. The FBS products are designed to protect and isolate individual circuits. The range is presented

in surface mounting enclosures and includes 2 versions of boxes:

- TPN 20-1600A (14 ratings)
- TPSN 20-1600A (14 ratings)

## Delivered with

- load break switch
- plain door
- extended rotary handle

## Technical data:

- Indoor
- Outdoor IP55
- nominal current (In): 20A up to 1600A
- rated voltage (Ue): 415V AC
- utilisation category: AC23A
- color: epoxy powder coating RAL 9002
- metallic enclosure
- 1.2mm thickness CR4 steel
- extra cabling space

## Comply with

- BS EN 61 439-1,
- BS EN 61 497-3,
- IEC 61 497-3
- LBS Sequence 1 & 3
- FCS Sequence 1 & 4



JAB316

Designation Enclosed LBS	In A	Utilisation Category	Cat. Ref. Trip pole & neutral	Cat. Ref. Trip pole & switched neutral
<b>Triple pole &amp; neutral</b>	20A	AC23A	<b>JAB302</b>	<b>JAB402</b>
	32A	AC23A	<b>JAB303</b>	<b>JAB403</b>
	63A	AC23A	<b>JAB306</b>	<b>JAB406</b>
	100A	AC22A	<b>JAB310</b>	<b>JAB410</b>
	125A	AC23A	<b>JAC312</b>	<b>JAC412</b>
	160A	AC23A	<b>JAC316</b>	<b>JAC416</b>
	200A	AC23A	<b>JAE320</b>	<b>JAE420</b>
	250A	AC23A	<b>JAE325</b>	<b>JAE425</b>
	315A	AC22A	<b>JAG331</b>	<b>JAG431</b>
	400A	AC22A	<b>JAG340</b>	<b>JAG440</b>
	630A	AC22A	<b>JAH363</b>	<b>JAH463</b>
	800A	AC23A	<b>JAH380</b>	<b>JAH480</b>
	1250A	AC23A	<b>JAH390</b>	<b>JAH490</b>
	1600A	AC23A	<b>JAH392</b>	<b>JAH492</b>

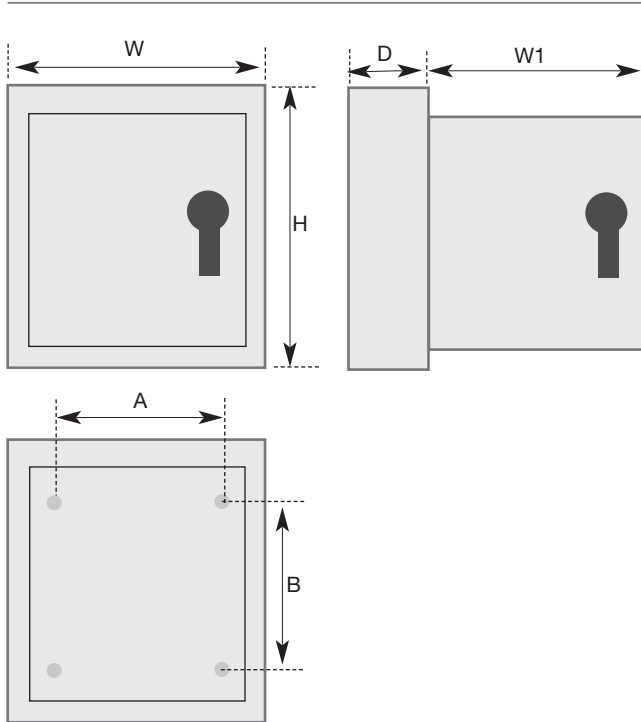


JAG440

Designation Enclosed LBS	In A	Cat. Ref. TP & N	Cat. Ref. TP & SW N
<b>IP55</b>	63A	<b>JAB306S-IP55</b>	<b>JAB406S-IP55</b>
	100A	<b>JAB310S-IP55</b>	<b>JAB410S-IP55</b>
	160A	<b>JAC316S-IP55</b>	<b>JAC416S-IP55</b>
	200A	<b>JAE320S-IP55</b>	<b>JAE420S-IP55</b>
	250A	<b>JAE325S-IP55</b>	<b>JAE425S-IP55</b>
	315A	<b>JAG331S-IP55</b>	<b>JAG431S-IP55</b>
	400A	<b>JAG340S-IP55</b>	<b>JAG440S-IP55</b>
	630A	<b>JAH363S-IP55</b>	<b>JAH463S-IP55</b>

Designation Enclosed LBS	In A	Utilisation Category	Cat. Ref.
<b>Cable extension boxes triple pole &amp; triple pole switched neutral</b>	125A , 160A 200A , 250A , 315A , 400A 630A , 800A		<b>JZA700</b> <b>JZA701</b> <b>JZA702</b>
<b>Auxiliary contact 1NO + 1NC</b>	20A to 100A 100A to 160A 200A to 630A 800A to 1600A		<b>HZ021</b> <b>HZ022</b> <b>HZ023</b> <b>HZ025</b>

Terminal cover	In	3P	4P
	125A to 200A	<b>HZC201</b>	<b>HZC202</b>
	250A to 400A	<b>HZC203</b>	<b>HZC204</b>
	630A	<b>HZC205</b>	<b>HZC206</b>
	800A	<b>HZ036</b>	<b>HZ046</b>
	1250A to 1600A	<b>HZ037</b>	<b>HZ047</b>



Reference						
	H	W	D	W1	A	B
JAB302	250	180	105	177	110	172
JAB402	250	180	105	177	110	172
JAB303	250	180	105	177	110	172
JAB403	250	180	105	177	110	172
JAB306	250	180	105	177	110	172
JAB406	250	180	105	177	110	172

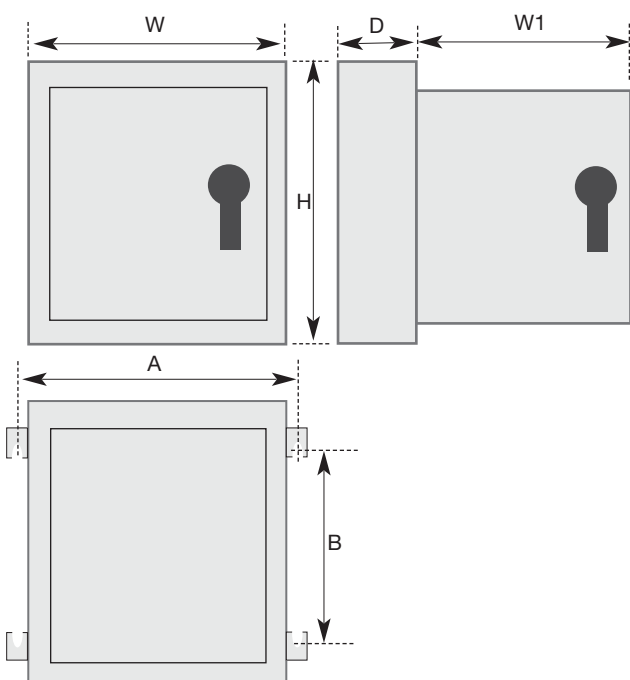
JAB310	250	200	150	182	130	172
JAB410	250	200	150	182	130	172
JAC312	300	250	150	232	140	192
JAC412	300	250	150	232	140	192
JAC316	300	250	150	232	140	192
JAC416	300	250	150	232	140	192

JAE320	400	375	200	357	265	292
JAE420	400	375	200	357	265	292
JAE325	400	375	200	357	265	292
JAE425	400	375	200	357	265	292

JAG331	500	375	200	357	265	380
JAG431	500	375	200	357	265	380
JAG340	500	375	200	357	265	380
JAG440	500	375	200	357	265	380

JAH363	650	500	300	481.5	390	529
JAH463	650	500	300	481.5	390	529
JAH380	650	500	300	481.5	390	529
JAH480	650	500	300	481.5	390	529
JAH390	1058	750	300	732	390	937
JAH490	1058	750	300	732	130	937

JZA700	200	250	300	/	140	100
JZA701	200	375	300	/	265	100
JZA702	200	500	300	/	390	134
JZA703	200	600	300	/	490	134



Reference							
		H	W	D	W1	A	B
JAB306S-IP55	JAB406S-IP55	300	300	200	300	330	195
JAB310S-IP55	JAB410S-IP55	300	300	200	300	330	195
JAC310S-IP55	JAC410S-IP55	400	300	200	300	330	295
JAE316S-IP55	JAE416S-IP55	600	400	250	400	430	495
JAE325S-IP55	JAE425S-IP55	600	400	250	400	430	495
JAG331S-IP55	JAG431S-IP55	700	500	250	500	530	595
JAG340S-IP55	JAG440S-IP55	700	500	250	500	530	595
JAH363S-IP55	JAH463S-IP55	800	600	400	600	630	695

**Description**

The range of IP66 isolators are designed to be used in outdoor applications with IP66 degree of protection. They are rated at AC22A and AC23A offer options of 2,3 poles and 4 poles with switched neutral. They are compact and easy to install with 2 screw quick release top cover

Rated voltage: 250 V AC  
440 V AC  
Material: Polycarbonate-UV grade

Rating AC22A is for switching of mixed resistive and inductive loads, including moderate overloads.

Rating AC22A is for switching of mixed resistive and inductive loads, including moderate overloads.

Rating AC23A is for switching of motor loads or other highly inductive loads.

**Mechanical specification:**

Protection category: IP66

**Devices & accessories:**

DP 20-40A  
TP & N 20-40A  
TP & SW N 20-63A

**Complies with**

BS EN 60947-3  
IEC 60947-3  
AS 3947-3

Designation	Characteristics	Pack qty.	Cat.Ref
-------------	-----------------	-----------	---------



JG220U

**Rating: AC22A**

**2 pole**

20A	2 pole IP66	1	JG220U
32A	2 pole IP66	1	JG232U
40A	2 pole IP66	1	JG240U
63A	2 pole IP66	1	JG263U

**3 pole**

20A	3 pole IP66	1	JG320U
32A	3 pole IP66	1	JG332U
40A	3 pole IP66	1	JG340U

**3 pole + switched neutral**

20A	4 pole IP66	1	JG420U
32A	4 pole IP66	1	JG432U
40A	4 pole IP66	1	JG440U
63A	4 pole IP66	1	JG463U



JG320IN

**Rating: AC23A**

**2 pole**

20A	2 pole IP66	1	JG220IN
32A	2 pole IP66	1	JG232IN
40A	2 pole IP66	1	JG240IN
63A	2 pole IP66	1	JG263IN

**3 pole**

20A	3 pole IP66	1	JG320IN
32A	3 pole IP66	1	JG332IN
40A	3 pole IP66	1	JG340IN

**3 pole + switched neutral**

20A	4 pole IP66	1	JG420IN
32A	4 pole IP66	1	JG432IN
40A	4 pole IP66	1	JG440IN
63A	4 pole IP66	1	JG463IN



JG380S

**Rating: AC22A**

**3 pole**

63A	3P IP65 isolator	1	JG363S
80A	3P IP65 isolator	1	JG380S
125A	3P IP65 isolator	1	JG325S

**2 pole**

Reference	Current	H	W	D
<b>JG220U</b>	20A	170	84	87
<b>JG232U</b>	32A	170	84	87
<b>JG240U</b>	40A	170	84	87
<b>JG263U</b>	63A	170	84	87

• All dimensions are in mm

**3 pole**

Reference	Current	H	W	D
<b>JG320U</b>	20A	170	84	87
<b>JG332U</b>	32A	170	84	87
<b>JG340U</b>	40A	170	84	87

• All dimensions are in mm

**3 pole + switched neutral**

Reference	Current	H	W	D
<b>JG420U</b>	20A	170	84	87
<b>JG432U</b>	32A	170	84	87
<b>JG440U</b>	40A	170	84	87
<b>JG463U</b>	63A	170	84	87

• All dimensions are in mm

**2 pole**

Reference	Current	H	W	D
<b>JG220IN</b>	20A	170	84	87
<b>JG232IN</b>	32A	170	84	87
<b>JG240IN</b>	40A	170	84	87
<b>JG263IN</b>	63A	170	84	87

• All dimensions are in mm

**3 pole**

Reference	Current	H	W	D
<b>JG320IN</b>	20A	170	84	87
<b>JG332IN</b>	32A	170	84	87
<b>JG340IN</b>	40A	170	84	87

• All dimensions are in mm

**3 pole + switched neutral**

Reference	Current	H	W	D
<b>JG420IN</b>	20A	170	84	87
<b>JG432IN</b>	32A	170	84	87
<b>JG440IN</b>	40A	170	84	87
<b>JG463IN</b>	63A	170	84	87

• All dimensions are in mm

# Energy & lighting control

## comfort and efficiency

Energy and lighting control product range allows to optimise energy consumption while increasing comfort



Latching relays	38
<hr/>	
Latching relays auxiliaries	39
<hr/>	
Relays & interface relays	42
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Contactors	43
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Override contactors	45
<hr/>	
Auxiliaries for contactors and relays	46

### Description

For the control of lighting circuits in residential buildings, small industry buildings and commercial buildings. Latching relays operates when impulsed by a signal voltage. The impulse can be provided via a pushbutton or switch. The first impulse sets the relay into its set (opposite) state, the next impulse returns it to its reset (original) state.

The latching relays are built to add on optionally the following auxiliaries :




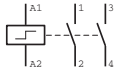

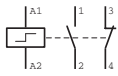

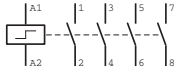

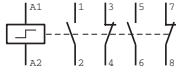

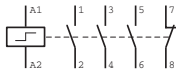
- an auxiliary for centralised ON/OFF control EPN 050
- an auxiliary contact for remote signalling EPN 051
- an auxiliary for multi levelled centralised control EPN 052
- an auxiliary for control by maintained contact EPN 053

### Connection capacity

10mm<sup>2</sup> rigid cables  
6mm<sup>2</sup> flexible cables

### Conform to standard

IEC60669-1 and IEC60669-2-7

Designation	Type	Coil VAC 50Hz	Coil VDC	Power Circuit AC1	Width in 17.5mm	Pack qty.	Cat. Ref.
 EPN510		230	110	16A-250V	1	12	<b>EPN510</b>
		48	24	16A-250V	1	12	<b>EPN501</b>
		24	12	16A-250V	1	12	<b>EPN513</b>
		12	-	16A-250V	1	12	<b>EPN511</b>
		8	-	16A-250V	1	12	<b>EPN512</b>
 EPN540		230	110	16A-250V	1	1	<b>EPN520</b>
		110	48	16A-250V	1	1	<b>EPN523</b>
		48	24	16A-250V	1	1	<b>EPN526</b>
		24	12	16A-250V	1	1	<b>EPN524</b>
		12	-	16A-250V	1	1	<b>EPN521</b>
		8	-	16A-250V	1	1	<b>EPN522</b>
 EPN540		230	110	16A-250V	1	1	<b>EPN515</b>
		110	48	16A-250V	1	1	<b>EPN516</b>
		48	24	16A-250V	1	1	<b>EPN503</b>
		24	12	16A-250V	1	1	<b>EPN518</b>
		12	-	16A-250V	1	1	<b>EPN519</b>
 EPN540		230	110	16A-400V	2	1	<b>EPN540</b>
		48	24	16A-400V	2	1	<b>EPN548</b>
		24	12	16A-400V	2	1	<b>EPN541</b>
 EPN540		230	110	16A-250V	2	1	<b>EPN525</b>
		24	12	16A-250V	2	1	<b>EPN528</b>
 EPN540		230	110	16A-400V	2	1	<b>EPN546</b>

**Auxiliaries for centralised control**  
 The EPN 050 allows the centralised control of several light sources which can be turned on or off simultaneously. The separate switching by pushing the pushbuttons, which are connected with the latching relay, remains possible.

The EPN 052 allows an overall central control of individual central on/off EPN 050

**Auxiliary contact**  
 A remote signalling can be realised with the auxiliary contact EPN 051.

**Auxiliary for control by maintained contact**  
 When control devices with permanent impulse are externally driven, e.g. time switches or limit switches, an impulse control directly to the latching relay's coil is possible with the auxiliary contact EPN 053.

Connection latching relay + auxiliary  
 Several auxiliaries can be combined with the latching relay.

**Connection capacity**  
 10mm<sup>2</sup> rigid cables  
 6mm<sup>2</sup> flexible cables

Designation	Voltage supply	Width in ■ 17.5mm	Pack qty.	Cat. Ref.
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EPN050

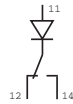
Auxiliary for centralised control

24 to 230V AC

1/2

1

**EPN050**



EPN051

Auxiliary contact

2A 250 V AC

1/2

1

**EPN051**



EPN052

Auxiliary for multi levelled centralised control

24 to 230V AC

1/2

1

**EPN052**



EPN053

Auxiliary for control by maintained contact

24 to 230V AC  
 12 to 110V DC

1/2

1

**EPN053**





## Technical characteristics

	EPN510 EPN515 EPN520	EPN516 EPN523	EPN501 EPN503 EPN526	EPN513 EPN518 EPN524	EPN511 EPN519 EPN521	EPN512 EPN522	EPN525 EPN540 EPN546	EPN548	EPN528 EPN541
Coil in AC									
voltage rating	230V	110V	48V	24V	12V	8V	230V	48V	24V
tolerance	+10/-20%								
frequency	50Hz								
start consumption	25VA						55VA		
Coil in DC									
voltage rating	110V	48V	24V	12V	-	-	110V	24V	12V
tolerance	+10/-20%								
start consumption	12VA						25VA		
Contacts									
max. perm. Current AC1	16A								
voltage	250V AC						400V AC		
electrical endurance	150 000 operations								
mechanical endurance	500 000 operations								
ohmic loss per current path	1.2W								
minimum duration of impulse	50 ms								
maximum time under voltage	1 H								
pushbutton with signal lamp									
without condensator	6 (1mA / lamp)								
ingress protection	IP20								
working temperature	-5 to +40°C								
storage temperature	-40 to +80°C								
Connection									
flexible	6 mm <sup>2</sup>								
rigid	10 mm <sup>2</sup>								

\* condensator parrallel with the coil

Incandescent lamps 230V with and without halogen	load	40W	60W	75W	100W	150W	200W	300W	500W
	number	45	30	24	15	12	9	5	3
Incandescent lamps Low voltage halogen	load	20W	50W	75W	100W	150W	300W		
	number	70	28	19	14	9	3		
Fluorescent lamps Uncompensated	load	15W	18W	30W	36W	58W			
	number	29	25	25	24	14			
Fluorescent lamps Parrallel compensation	load	15W	18W	30W	36W	58W			
	number	27	27	25	25	16			
	C total max <sub>(a)</sub>	121µF	121µF	112µF	112µF	112µF			
Two lamps circuit series compensation	load	2x18W	2x20W	2x36W	2x40W	2x58W	2x65W		
	number	40	40	22	22	12	12		
	C	2.7µF	2.7µF	3.4µF	3.4µF	5.3µF	5.3mF		
	load	18W	36W	58W					
Two lamp circuit with electronics power supply units	number	30	28	15					
	load	2x18W	2x36W	2x58W					
Fluo compact uncompensated	number	15	13	8					
	load	7W	10W	18W	26W				
Fluo compact electronic power supply unit	number	50	45	40	25				
	load	11W	15W	20W	23W				
High intensity discharge metal halogen lamps, uncompensated	number	80	60	50	40				
	load								
Metal halogen lamps, parrallel compensation	load	50W	80W	125W	250W	400W			
	number	11	9	7	3	2			
	C total max <sub>(a)</sub>	9	8	6	3	2			
High pressure sodium vapour lamps, uncompensated	load	63µF	58µF	60µF	54µF	50µF			
	number	70W	150W	250W	400W				
High pressure sodium vapour lamps, parrallel compensated	number	9	5	3	2				
	load	70W	150W	250W	400W				
	C total max <sub>(a)</sub>	5	3	2	1				
	load	60µF	54µF	64µF	50µF				

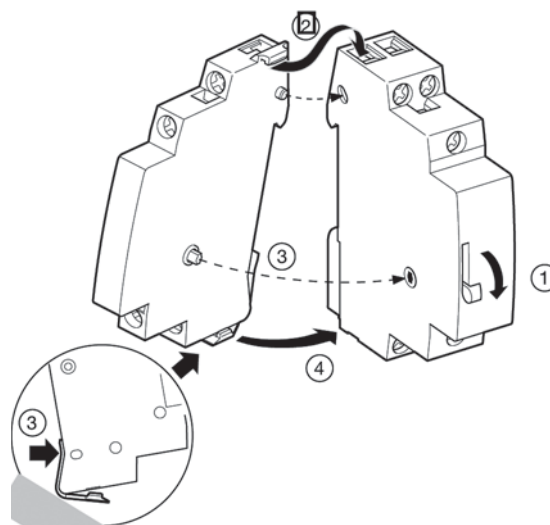
(a): these values must not be exceeded

## Auxiliaries for latching relays

	EPN050	EPN051	EPN052 - EPN053
voltage rating	(a)	-	(a)
	24 to 230V AC	-	24 to 230V AC
nominal load	-	2A/250V AC	-
I <sub>min</sub> /230V AC	-	15mA	-
working temperature	-5 to +40°C		
storage temperature	-40 to 80°C		
Connections : flexible	6 mm <sup>2</sup>		
rigid	10mm <sup>2</sup>		

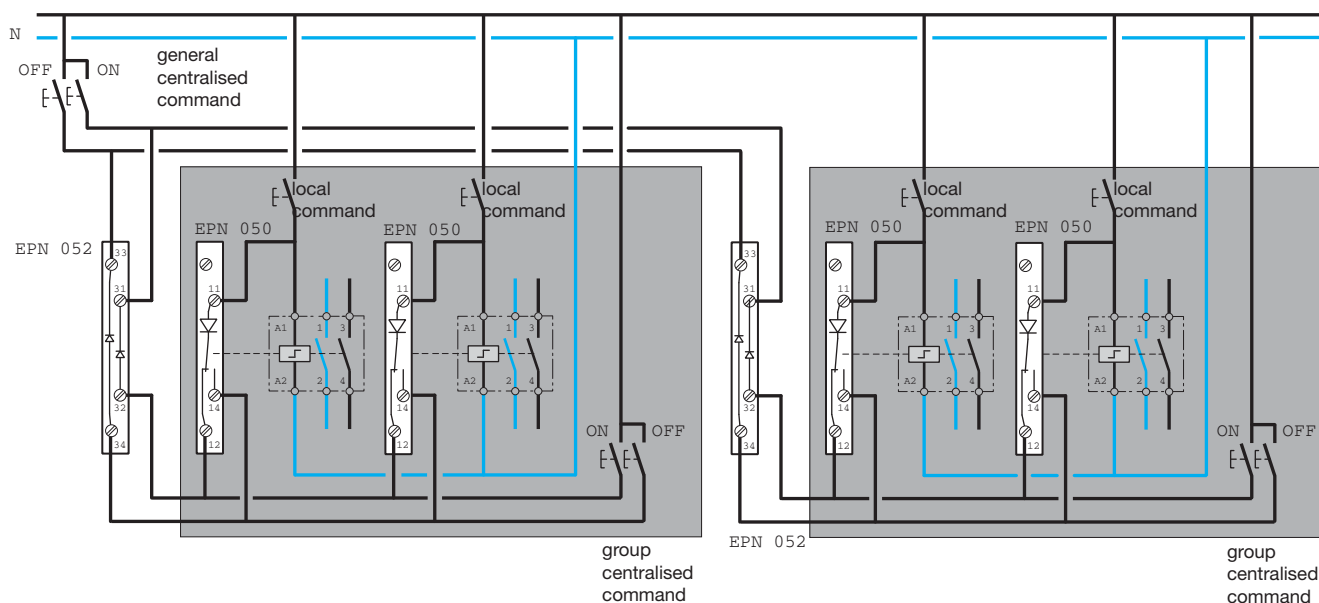
(a) : according to a latching relay connected with an auxiliary

## Installation of the auxiliaries

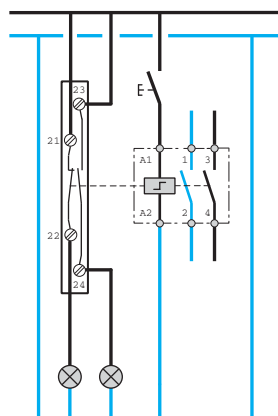


## Application diagram

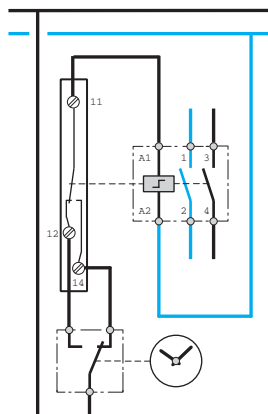
### centralised command (EPN 050 - EPN 052)



### Remote signalling (EPN 051)



### Maintained command (EPN 053)



**Relays**

To provide remote control of low power circuits max.16A.

They are equipped with a 3 position manual control button:

- permanent ON,
- automatic mode,
- permanent OFF.

Complies with IEC 61095.

It is recommended to use a heat

dissipation insert LZ060 between each 3 products.

**Auxiliary contact**

Associated with a relay, it allows remote signaling.  
Mechanical status indicator

**Interface relays**

Power contacts adapted to very low voltage circuits. It is operating silently.

A signal indicates when the coil

is under voltage.

These relays ensure a galvanic isolation between LV and VLV up to 4kV.

Description	Type	Coil AC 50Hz	In power circuit AC7-a / AC1	Width in 17.5mm	Pack qty.	Cat. ref.
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**Relays**

	<b>2NO</b>	230V	16A-250V	1	1	<b>ERC216</b>
		24V	16A-250V	1	1	<b>ERD216</b>
		8/12V	16A-250V	1	1	<b>ERL216</b>
	<b>2NC</b>	230V	16A-250V	1	1	<b>ERC217</b>
		24V	16A-250V	1	1	<b>ERD217</b>
		8/12V	16A-250V	1	1	<b>ERL217</b>
	<b>1NO+1NC</b>	230V	16A-250V	1	12	<b>ERC218</b>
		24V	16A-250V	1	1	<b>ERD218</b>
		8/12V	16A-250V	1	1	<b>ERL218</b>
	<b>3NO</b>	230V	16A-440V	2	1	<b>ERC316</b>
	<b>4NO</b>	230V	16A-440V	2	1	<b>ERC416</b>
	<b>2NO+2NC</b>	230V	16A-440V	2	1	<b>ERC418</b>
		24V	16A-440V	2	1	<b>ERD418</b>
		12V	16A-440V	2	1	<b>ERL418</b>

**Humfree relays**

	<b>2NO+2NC</b>	24V AC/DC	16A-440V	2	1	<b>ERD418S</b>
		12V AC/DC	16A-440V	2	1	<b>ERL418S</b>

**Interface relays VLV/LV**

	coil voltage: 10 to 26V AC/DC output: 1 changeover contact max. 5A 230V AC min. 10mA - 12V DC	1	1	<b>EN145</b>
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**Interface relays LV/VLV**

	coil voltage: 230V AC output: 1 changeover contact max. 5A 230V AC min. 10mA - 12V DC	1	1	<b>EN146</b>
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ERC218



ERC418



EN145

## Contactors

Contactors are essential power devices to control heating, lighting or ventilation systems. They are recommended in association with control and energy management devices (thermostats, delay timers, programmers...)



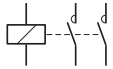
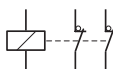

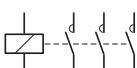
Standard 1 and 2 versions are recommended for applications where a reduced consumption

and heating dissipation are needed.

Complies with IEC 61095.

The contactors can be associated with the auxiliary contact ESC080 for remote signaling.

It is recommended to use a heat dissipation insert LZ060 between each 3 products.

Description	Type	Coil AC 50Hz	In power circuit AC7-a / AC1	Width in 17.5mm	Pack qty.	Cat. ref.	
<b>Contactors</b>							
	<b>1NO</b>	230V	25A-250V	1	12	<b>ESC125</b>	
		24V	25A-250V	1	1	<b>ESD125</b>	
		8/12V	25A-250V	1	1	<b>ESL125</b>	
	<b>1NC</b>	230V	25A-250V	1	1	<b>ESC126</b>	
		<hr/>					
	<b>2NO</b>	230V	25A-250V	1	12	<b>ESC225</b>	
			40A-440V	3	1	<b>ESC240</b>	
			63A-440V	3	1	<b>ESC263</b>	
		24V	25A-250V	1	12	<b>ESD225</b>	
			40A-440V	3	1	<b>ESD240</b>	
			63A-440V	3	1	<b>ESD263</b>	
		12V	40A-440V	3	1	<b>ESL240</b>	
			63A-440V	3	1	<b>ESL263</b>	
			8/12V	25A-250V	1	1	<b>ESL225</b>
			110/127V	25A-250V	1	1	<b>ESM225</b>
	<b>2NC</b>	230V	25A-250V	1	12	<b>ESC226</b>	
			40A-440V	3	1	<b>ESC241</b>	
			63A-440V	3	1	<b>ESC264</b>	
		24V	25A-250V	1	1	<b>ESD226</b>	
			40A-440V	3	1	<b>ESD241</b>	
			63A-440V	3	1	<b>ESD264</b>	
		12V	40A-440V	3	1	<b>ESL241</b>	
			63A-440V	3	1	<b>ESL264</b>	
			8/12V	25A-250V	1	1	<b>ESL226</b>
			<hr/>				
	<b>1NO+1NC</b>	230V	25A-250V	1	12	<b>ESC227</b>	
		24V	25A-250V	1	1	<b>ESD227</b>	
		8/12V	25A-250V	1	1	<b>ESL227</b>	
		110/127V	25A-250V	1	1	<b>ESM227</b>	
	<b>3NO</b>	230V	25A-440V	2	6	<b>ESC325</b>	
			40A-440V	3	4	<b>ESC340</b>	
			63A-440V	3	1	<b>ESC363</b>	



ESC225



ESD263



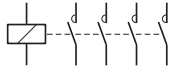
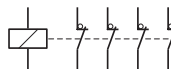
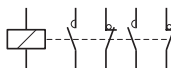

ESC325



ESC425



ESC463

Description	Type	Coil AC 50Hz	In power circuit AC7-a / AC1	Width in ■ 17.5mm	Pack qty.	Cat. ref.	
<b>Contactors</b>							
	<b>4NO</b>	230V	25A-440V	2	6	<b>ESC425</b>	
			40A-440V	3	4	<b>ESC440</b>	
			63A-440V	3	4	<b>ESC463</b>	
		24V	25A-440V	2	6	<b>ESD425</b>	
			40A-440V	3	1	<b>ESD440</b>	
			63A-440V	3	1	<b>ESD463</b>	
		12V	25A-440V	2	1	<b>ESL425</b>	
			40A-440V	3	1	<b>ESL440</b>	
			63A-440V	3	1	<b>ESL463</b>	
		110/127V	40A-440V	3	1	<b>ESM440</b>	
		<b>4NC</b>	230V	25A-440V	2	1	<b>ESC426</b>
				40A-440V	3	1	<b>ESC441</b>
63A-440V				3	1	<b>ESC464</b>	
		24V	25A-440V	2	1	<b>ESD426</b>	
			63A-440V	3	1	<b>ESD464</b>	
			12V	25A-440V	2	1	<b>ESL426</b>
		<b>2NO+2NC</b>	230V	25A-440V	2	1	<b>ESC427</b>
				40A-440V	3	1	<b>ESC442</b>
				63A-440V	3	1	<b>ESC465</b>
		24V	25A-440V	2	1	<b>ESD427</b>	
			12V	25A-440V	2	1	<b>ESL427</b>
				<b>3NO+1NC</b>	230V	25A-440V	2
40A-440V	3	4				<b>ESC443</b>	
63A-440V	3	1				<b>ESC466</b>	
	24V	25A-440V		2	1	<b>ESD428</b>	
		12V		25A-440V	2	1	<b>ESL428</b>

**Override contactors**

For the remote switching and control of power circuits.

They are equipped with a 3 position manual control button:

- permanent ON,
- automatic mode,
- permanent OFF.

Can be associated with the auxiliary contact ESC080 for remote signaling.

Complies with IEC 61095.

It is recommended to use a heat dissipation insert LZ060 between each 3 products.



ERC225



ERC425

Description	Type	Coil AC 50Hz	In power circuit AC7-a / AC1	Width in 17.5mm	Pack qty.	Cat. ref.	
<b>Override contactors</b>							
	<b>1NO</b>	230V	25A-250V	1	12	<b>ERC125</b>	
	<b>2NO</b>	230V	25A-250V	1	12	<b>ERC225</b>	
			40A-440V	3	1	<b>ERC240</b>	
			63A-440V	3	1	<b>ERC263</b>	
		24V	25A-250V	1	12	<b>ERD225</b>	
			40A-440V	3	1	<b>ERD240</b>	
			63A-440V	3	1	<b>ERD263</b>	
		12V	25A-250V	3	1	<b>ERL225</b>	
			40A-440V	3	1	<b>ERL240</b>	
			63A-440V	3	1	<b>ERL263</b>	
	8/12V	25A-250V	1	1	<b>ERL225</b>		
	<b>2NC</b>	230V	25A-250V	1	12	<b>ERC226</b>	
	<b>3NO</b>	230V	25A-440V	2	6	<b>ERC325</b>	
		<b>4NO</b>	230V	25A-440V	2	6	<b>ERC425</b>
			24V	25A-440V	2	6	<b>ERD425</b>
12V	25A-440V		2	1	<b>ERL425</b>		
	<b>4NC</b>	230V	25A-440V	2	1	<b>ERC426</b>	
	<b>2NO+2NC</b>	230V	25A-440V	2	1	<b>ERC427</b>	
	<b>3NO+1NC</b>	230V	25A-440V	2	1	<b>ERC428</b>	

**Auxiliary contact**

Associated with a relay or a contactor, it allows to show the product status or remote signaling.

Not compatible with 1 module humfree contactors and EN145 / EN146.

**Heat dissipation insert**

It is recommended to use a heat dissipation insert LZ060 between each 3 products.

**Sealing covers**

Not compatible with EN145 / EN146.

Description	Type	In power circuit AC7-a / AC1	Width in ■ 17.5mm	Pack qty.	Cat. ref.
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**Auxiliary contact**



**1NO+1NC**

6A-250V

1/2

1

**ESC080**



ESC080

**Sealing cover**

for 1 ■ contactors

1

10

**ESC001**

for 2 ■ contactors

2

10

**ESC002**

for 3 ■ contactors

3

10

**ESC003**



ESC002

**Heat dissipation insert**

1/2

12

**LZ060**



LZ060

Description		Modular contactor and relay						Auxiliary contact
Standard conformity		EN 61095						
Approvals		NF - VDE - IMQ - KEMA - RMC / CCC						
		Relay	Contactor	Relay	Contactor	Contactor	Contactor	Accessory
Number of modules		1		2		3		0.5
Thermal current I <sub>th</sub> (40°C)		16A	25A	16A	25A	40A	63A	6A
Rated frequency		50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz
Rated insulation voltage (U <sub>i</sub> )		250V	250V	440V	440V	440V	440V	250V
Rated impulse withstand voltage (U <sub>imp</sub> )		4kV	4kV	4kV	4kV	4kV	4kV	4kV
Protection degree		2	2	2	2	2	2	2
<b>Rated operating currents and power ratings in AC</b>								
AC-1 / AC-7a	rated operational currents I <sub>e</sub>	16A	25A	16A	25A	40A	63A	-
	rated operational power	230V 400V	3kW -	4.6kW -	3kW 8.9kW	4.6kW 13.8kW	7.3kW 22kW	11.6kW 35kW
AC-3 / AC-7b	rated operational currents I <sub>e</sub>	5.5A	8.5A	5.5A	8.5A	25A	32A	-
	rated operational power	230V 400V	570W -	880W -	570W 1.7kW	880W 2.6kW	2.6W 7.8kW	3.3W 10kW
AC-12	rated operational currents at 230V	-	-	-	-	-	-	6A
AC-15	rated operational currents at 230V	-	-	-	-	-	-	2A
<b>Mechanical and electrical endurences</b>								
Mechanical endurance	nr of operations	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Electrical endurance at I <sub>e</sub> AC7a (AC12 for aux contacts)	nr of operations	60,000	60,000	60,000	60,000	60,000	60,000	60,000
<b>MCB protected short-circuit withstand</b>								
Prospected short-circuit current	rms	1kA	3kA	1kA	3kA	3kA	3kA	1kA
Associated protection		MCB C16-6kA	MCB C25-6kA	MCB C16-6kA	MCB C25-6kA	MCB C40-10kA	MCB C63-10kA	6A 10x38 gG fuse or mcb
<b>Power dissipation</b>								
Power dissipation per current path		1W	1.5W	1W	1.5W	3.2W	5W	0.4W
<b>Magnetic system for eco and standard contactor</b>								
Pick-up		7.4VA	7.4VA	9.2VA	9.2VA	60VA	60VA	-
Coil consumption		1.8VA	1.8VA	1.85VA	1.85VA	7VA	7VA	-
Closing delay		25ms	25ms	25ms	25ms	25ms	25ms	-
Opening delay		15ms	15ms	15ms	15ms	20ms	20ms	-
<b>Connection</b>								
Main contact cable section	rigid	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	4...25mm <sup>2</sup>	4...25mm <sup>2</sup>	1...6mm <sup>2</sup>
	flexible	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	4...16mm <sup>2</sup>	4...16mm <sup>2</sup>	1...6mm <sup>2</sup>
Main contact connection screw	type	M3.4	M3.4	M3.4	M3.4	M5	M5	M3.4
	posidrive	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2
	max. tight. torque	1.2Nm	1.2Nm	1.2Nm	1.2Nm	2Nm	2Nm	1.2Nm
Coil connection cable section	rigid	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	1...10mm <sup>2</sup>	-
	flexible	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	1...6mm <sup>2</sup>	-
Coil connection screw	type	M3.5	M3.5	M3.5	M3.5	M4	M4	-
	posidrive	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	-
	max. tight. torque	1.2Nm	1.2Nm	1.2Nm	1.2Nm	1.5Nm	1.5Nm	-
<b>Working temperature</b>								
		-10°C to +50°C						
<b>Storage temperature</b>								
		-40°C to +80°C						



## Choice of contactors

The choice of contactor is based on many factors:

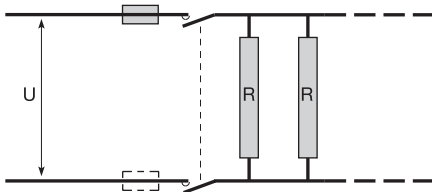
- type of the load supplied,
- nominal current of the load,
- operating voltage,
- number of operations, etc..

The contactors are AC7-a (resistive load) and AC7-b (inductive load) approved.

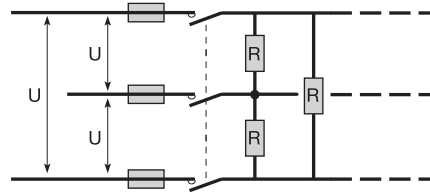
## Heating applications

The choice of the contactor is based on the electrical heating load, and the targeted life time.

### Single phase



### Three phase supply



Number of operations			60,000	100,000	150,000	300,000	600,000
Maximum load* in kW	230V	16A	3.0	2.5	1.9	0.8	0.7
		25A	4.6	4.0	3.0	1.3	1.0
		40A	7.3	6.3	4.7	2.2	1.6
		63A	11.6	10.0	7.5	3.5	2.5
	400V	16A	8.9	8.0	5.8	2.8	2.0
		25A	13.8	12.0	8.6	4.3	3.0
		40A	22.0	18.5	14.3	6.3	5.0
		63A	35.0	30.0	22.6	10.2	7.6

\* On three phase configuration the maximum load per phase corresponds to the values states divided by 3.

### Example:

Function of a heating installation 200 days/annum, 75 operations

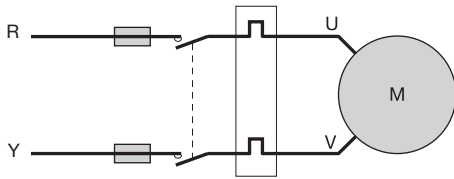
per day (1 opening + 1 closing = 2 operations)

Mechanical life = 10 years

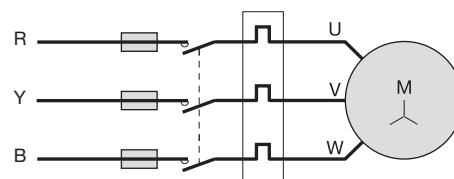
Total number of operations:  $200 \times 75 \times 10 = 150,000$

in that case, depending on the type of circuit, select a contactor 40A 230V to control a load of 4.7 kW, or a contactor 16A 400V to control a load up to 5.8 kW.

**Motor applications (AC7-b equivalent to AC3)  
Single phase 230V**



**Three phase 400V**



	Contactor rating	Control diagram	
		2P 230V single phase	3P 400V three phase
<b>Maximum power for the motor</b>	16A	0.57 kW	1.7 kW
	25A	0.88 kW	2.65 kW
	40A	2.6 kW	7.8 kW
	63A	3.3 kW	10 kW

**Influence of working temperature:**

Derating factor between 40°C and 50°C : 0.9

Example: heating with convector

The maximum load of ESC225 is 4.6kW for 60,000 operations and for a temperature <40°C.

between 40°C and 50°C, the load is 4.6 x 0.9 i.e. 4.14kW

**Adjacent fitting:**

It is necessary to put a heat dissipation insert (reference LZ060) between each 3 products, or each humfree contact.

## Lighting selection

Due to the large variety of electrical characteristics in lamps, especially for the inrush current, the chart gives the maximum number of lamps based on the lamp technology and the inrush current (high / low). The goal is to give the most precise and the highest number of lamps acceptable for the contactor.

If the inrush current is not known, choose the column "I peak high" in order to favour the contactor lifetime.

The table below indicates the number of lamps (or dual fittings) that can be connected to each pole of the contactor on 230V/50hz circuits.

Type	Power	1 and 2 modules				3 modules			
		I peak high 16A	I peak low 16A	I peak high 25A	I peak low 25A	I peak high 40A	I peak low 40A	I peak high 63A	I peak low 63A
<b>Incandescent lamps</b>									
tungsten & halogen lamps	40W	32	38	50	60	76	102	120	160
	60W	21	31	33	48	67	79	105	125
	75W	17	24	27	38	67	63	105	100
	100W	13	19	20	30	41	48	65	75
	150W	9	13	13	20	29	32	45	50
	200W	6	10	10	15	22	24	35	38
	300W	4	6	7	10	15	16	23	25
	500W	3	4	4	6	9	10	14	15
	1000W	1	2	2	3	4	5	7	8
	<b>Fluorescent tubes</b>								
energy saving lamp compact fluo lamp with external electronic ballast or compensated	13W	11	21	17	33	55	108	86	170
	14W	7	21	11	33	36	108	57	170
	17W	7	21	11	33	36	108	57	170
	18W	7	21	11	33	36	108	57	170
	24W	7	17	11	27	36	75	57	91
	26W	7	12	11	19	36	58	57	91
	32W	7	12	11	19	36	58	57	91
	36W	7	12	11	19	36	58	57	91
	40W	7	12	11	19	36	58	57	91
	42W	7	12	11	19	36	58	57	91
	55W	7	12	11	19	36	58	57	91
	60W	6	10	10	15	27	42	42	66
	energy saving lamp compact fluo lamp with integrated electronic ballast substitute for incandescent lamps	5W	17	32	27	50	86	159	135
7W		17	32	27	50	86	159	135	250
9W		17	32	27	50	86	159	135	250
11W		17	32	27	50	86	159	135	250
15W		17	32	27	50	86	159	135	250
18W		13	22	20	35	63	111	100	175
20W		13	22	20	35	63	111	100	175
23W		13	22	20	35	63	111	100	175
26W		13	22	20	35	63	111	100	175
single - electronic ballast or compensated	14W	7	32	11	50	36	162	57	255
	21W	7	21	11	33	36	108	57	170
	22W	7	21	11	33	36	108	57	170
	24W	7	17	11	27	36	81	57	127
	28W	7	17	11	27	34	81	53	127
	35W	7	17	11	27	34	81	53	127
	39W	7	12	11	19	29	58	45	91
	40W	7	12	11	19	29	58	45	91
	49W	6	12	10	19	29	58	45	91
	54W	6	12	10	19	29	58	45	91
	55W	6	10	10	15	27	44	42	70
	60W	6	10	10	15	27	44	42	70
	80W	6	10	10	15	27	44	42	70
	95W	6	7	10	11	25	29	39	46
	120W	6	7	10	11	25	29	39	46
double - electronic ballast	2x14W	7	17	11	27	34	81	53	127
	2x21W	7	12	11	19	29	58	45	91
	2x28W	6	10	10	15	27	44	42	70
	2x40W	6	10	10	15	27	44	42	70
	2x49W	6	7	10	11	25	29	39	46
	2x60W	6	7	10	11	25	29	39	46

Type	Power	1 and 2 modules				3 modules			
		I peak high 16A	I peak low 16A	I peak high 25A	I peak low 25A	I peak high 40A	I peak low 40A	I peak high 63A	I peak low 63A
<b>Discharge lamps</b>									
Low pressure sodium-vapour lamps (uncompensated)	18W	8	12	10	18	18	23	21	36
	35W	4	6	6	10	10	16	13	25
	55W	3	6	6	9	9	14	12	22
	90W	2	4	4	6	6	13	9	20
	135W	1	3	3	4	4	8	6	12
	180W	1	2	2	3	4	6	5	10
low pressure sodium-vapour lamps (electronic ballast)	35W	4	6	6	10	13	33	23	51
	55W	3	5	5	8	13	24	19	38
	66W	3	5	4	8	13	24	19	38
	91W	2	4	3	6	13	20	16	31
high pressure sodium-vapour lamps (uncompensated)	35W	11	17	14	22	30	40	35	60
	50W	9	15	12	17	22	28	25	42
	70W	8	10	9	12	18	20	19	32
	80W	7	9	8	11	15	19	18	29
	110W	6	8	7	10	14	17	16	25
	150W	4	6	5	7	10	13	12	18
	250W	2	3	3	4	6	8	7	11
	400W	0	0	0	1	4	5	5	8
	1000W	0	0	0	1	2	3	3	4
	high pressure sodium-vapour lamps (electronic ballast)	45W	6	10	9	12	13	36	25
50W		6	10	9	12	13	34	24	43
60W		6	10	9	12	13	32	23	41
70W		4	6	6	9	13	23	18	36
100W		3	6	5	9	13	18	16	32
150W		3	6	5	9	13	14	14	30
halogen metal vapour lamp (uncompensated)	35W	12	27	24	40	42	68	55	106
	70W	10	16	15	24	26	42	34	64
	150W	6	8	7	12	14	20	17	32
	250W	3	5	5	8	9	14	12	21
	400W	1	3	2	4	6	8	7	13
	1000W	0	0	0	1	3	4	4	5
halogen metal vapour lamp (electronic ballast)	20W	6	13	10	20	22	56	34	88
	35W	6	13	10	20	22	56	39	80
	70W	5	10	8	15	22	56	39	80
	150W	3	6	5	12	12	32	22	60
	210W	4	6	5	12	10	28	19	50
	315W	4	6	5	12	8	26	17	48

# Power interface programming

## solution for energy efficiency

Contactors, relays, delay timers, latching relays, energymeters: a whole range of devices to control installations for more energy efficiency.



Analogue time switches modular	54
<hr/>	
Analogue time switches 72 x 72mm	56
<hr/>	
Digital time switches	58
<hr/>	
Indicator lights	61
<hr/>	
Push buttons	62
<hr/>	
Twilight switches	64
<hr/>	
Multi-function meters	66

### Description

Electromechanical time switches 1 channel for daily or weekly programming.  
To control lighting, heating, household appliances, shop windows etc...  
To improve comfort and save energy.

### Applications

Domestic and commercial premises.  
DIN rail mounting

### Technical data

- programming by captive segments.
- manual override:
- On 1 module devices:
  - automatic
  - permanent ON
- On 3 and 5 module devices:
  - automatic
  - permanent ON
  - permanent OFF

### Minimum switching time:

- 15 min for daily versions
- 2 hours for weekly versions
- 15 min and 2 hours on the daily+weekly version

### Connection capacity:

1 to 4mm<sup>2</sup>

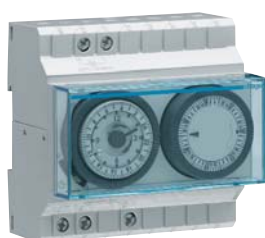
Complies with EN 60 730.

Designation	Voltage	Cycle	Width in 17.5 mm	Cat. ref.
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EH071

<b>Analogue time switches modular compact</b>	230V 50Hz	24h without battery reserve	1	<b>EH010</b>
1 NO 16 A - 250 V AC1		24h reserve: 200 h	1	<b>EH011</b>
		7day reserve: 200h	1	<b>EH071</b>



EH191

<b>Analogue time switches standard modular version</b>	230V 50Hz	24h without hand without battery reserve	2	<b>EH209</b>
1 NO changeover 16 A - 250 V AC1		24h without battery reserve	2	<b>EH210</b>
		24h reserve: 200 h	2	<b>EH211</b>
		7day reserve: 200 h	2	<b>EH271</b>
		24h + 7day reserve: 200h	5	<b>EH191</b>



EH111

		24h without battery reserve	3	<b>EH110</b>
		24h without battery reserve	3	<b>EH111</b>
	6 to 24V AC/DC	24h without battery reserve	3	<b>EH110A</b>
		24h reserve: 200 h	3	<b>EH111A</b>
		7day reserve: 200 h	3	<b>EH171A</b>



EH110A

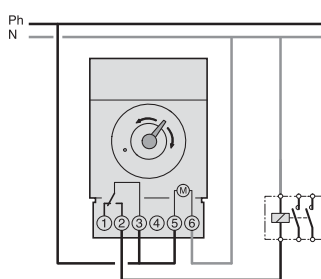
<b>Sealing kit for 3 "modules" time switch</b>	<b>EH901</b>
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<b>Wall mounting kit for 3 "modules" time switch</b>	<b>EH902</b>
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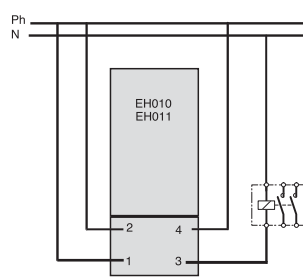
## Technical specifications

	EH010	EH011	EH071	EH110	EH111	EH191
<b>Width in</b> <b>17.5mm</b>	1	1	1	3	3	5
<b>Version</b>	daily	daily	weekly			daily + weekly
<b>Electrical characteristics</b>						
voltage supply	230V +10/-10%			230V	230V	230V +10/-10%
frequency				50/60Hz		
consumption				0.5VA		
output	1NO			changeover		
<b>Switching capacity</b>						
AC1				16A/250V		
inductive load (cos φ = 0.6)	4A/250V			3A/250V		
incandescent lamps				900W		
<b>Characteristics</b>						
technology				quartz		
dial	24 h		7 days		24 h	24 h and 7 days
switching dial	15 min		1h 45			15 min and 2 h
min. switching	30 min		3 h 30		15 min	15 min and 2 h
max. number of switching	96		96			96/84
accuracy				+/- 1 sec per day		
supply failure reserve reached in		200 h	200 h			200 h
manual override				auto/ON/OFF		
<b>Environment</b>						
ingress protection				IP20		
working temperature				-10 to +45°C		
storage temperature				-10 to +50°C		
connection				0.5 to 4mm <sup>2</sup>		

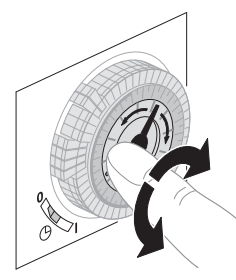
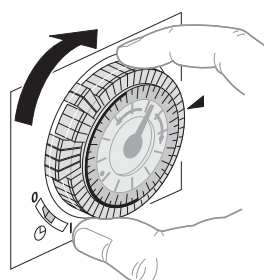
	EH209	EH210	EH211	EH271	EH110A	EH111A	EH171A
<b>Width in</b> <b>17.5mm</b>	2	2	2	2	3	3	3
<b>Version</b>	daily	daily	daily	weekly	daily	daily	weekly
<b>Electrical characteristics</b>							
voltage supply	230V +10/-15%			230V +10/-15%		6 to 24V AC/DC	
frequency				50/60Hz		50/60 Hz	
consumption				0.5 VA		0.5 VA	
output	1NO changeover					1 NO changeover	
<b>Switching capacity</b>							
AC1				16A/230V		16A/230V	
inductive load (cos φ = 0.6)				4A/230V		4A/230V	
incandescent lamps				1000W		900W	
<b>Characteristics</b>							
technology				quartz		quartz	
dial	24 h			7 days	24 h		7 days
switching dial	15 min			1 h 45	15 min		2 h
min. switching	30 min			3 h 30	30 min		4 h
max. number of switching	48					48	
accuracy				+/- 1 sec per day		± 6 min per year	
supply failure reserve reached in	-	-	200 hours	200 hours	-	72 hours	72 hours
manual override	auto/ON/OFF					auto/ON/OFF	
<b>Environment</b>							
ingress protection	IP20					IP20	
working temperature	-10 to +55°C					-10° to +55°C	
storage temperature	-20° to +70°C			-20° to +70°C		-10° to +55°C	
connection	1.5 to 6mm <sup>2</sup>					1 to 4mm <sup>2</sup>	



EH110 Electrical connections



EH010, EH011 electrical connections



Simple time setting and programming using dual direction dial



**Description**

For daily or weekly programming.  
1 channel for the control of lighting, heating, household appliances, shop windows etc..  
To improve comfort and save energy.

**Applications**

Domestic and commercial premises.

**Technical data**

- suitable for surface, flush or din rail mounting
- programming by captive segments
- manual override with automatic return to programme
- operating reserve: 200 hours after being connected for 120 hours
- with clock hand
- output: voltage free changeover contact 16A/250V



**Daily version**

Programming in steps of 10 minutes.  
Minimum time between 2 switching intervals: 20 min

**Weekly version**

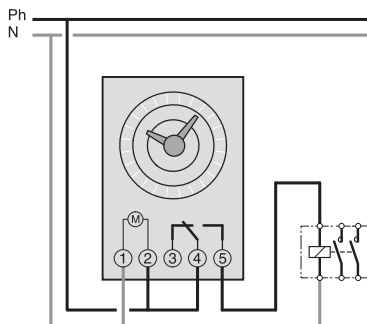
Programming in steps of one hour.  
- minimum time between 2 switching intervals: 2 hours  
- switching accuracy: 10 min

Complies with EN 60 730-2-7.

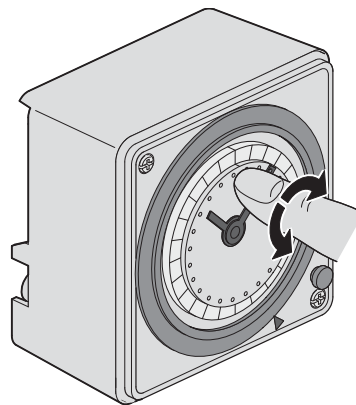
Designation	Characteristics	Pack qty.	Cat. ref.
 <p>EH711</p>	<b>1 channel daily cycle</b>		
	supply : 230V 50/60Hz		
	without battery reserve	1	<b>EH710</b>
	with battery reserve	1	<b>EH711</b>
reserve : 200 hours after being connected for 120 hours			
 <p>EH771</p>	<b>1 channel weekly cycle</b>		
	supply : 230V 50/60Hz		
	without battery reserve	1	<b>EH770</b>
	with battery reserve	1	<b>EH771</b>
reserve : 200 hours after being connected for 120 hours			
<b>1 channel daily cycle</b>	supply : 6 to 24V AC/DC 50/60Hz		
	without battery reserve	1	<b>EH710A</b>
<b>Flush mounting kit</b>			<b>EH900</b>

## Technical specifications

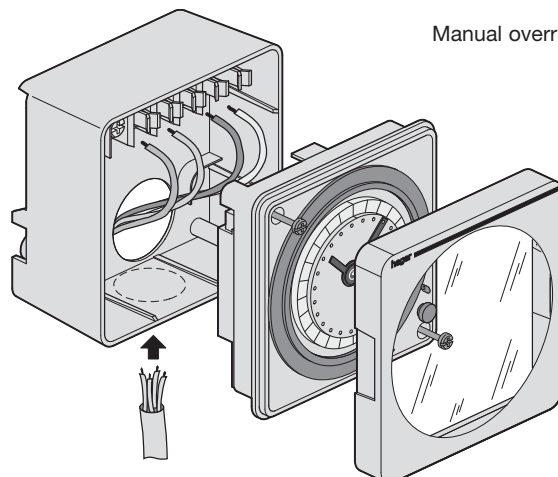
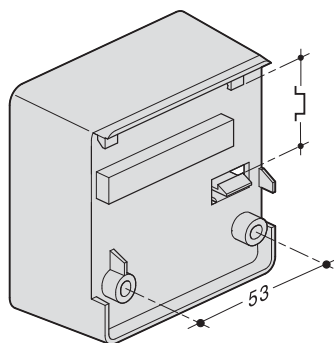
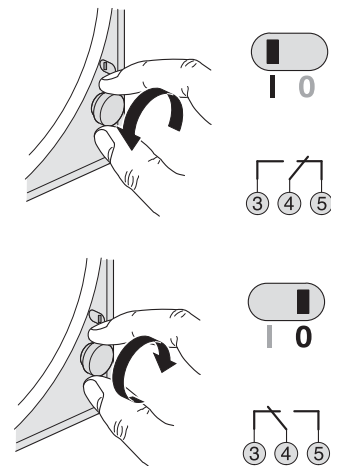
	EH710	EH711	EH770	EH771	EH710A
<b>Dimensions (mm)</b>	72x72x48	72x72x48	72x72x48	72x72x48	72x72x48
<b>Electrical characteristics</b>	daily	daily	weekly	weekly	daily
voltage supply	230V +10/-15% 50/60Hz				110V to 240V AC 50/60Hz 48V DC +10/-15%
consumption	0.5VA				
output	1 changeover				1 N/O
<b>Switching capacity</b>					
AC1	16A/250V				
inductive load (cos φ = 0.6)	3A/250V				
incandescent lighting	1000W				
<b>Characteristics</b>					
technology	quartz				
dial	24h		7 days		24h
switching dial	10min		1 hour		10 min
minimum switching	20min		2 hour		20 min
working accuracy	+/- 1 sec per day				
supply failure reserve	-	200 hours	-	200 hours	-
reached in		120 hours		120 hours	
manual switch	temporary ON or OFF				
<b>Environment</b>					
working temperature	-10 to +50°C				
storage temperature	-20 to +60°C				
connection capacity	1 to 6mm <sup>2</sup>				



EH710 Electrical connection



Very easy programming with dual direction dial



Manual override

**Description**

Use : domestic and commercial buildings  
 For the control of lighting, heating, household appliances, shop windows, signage etc..., to improve comfort and to save energy.

**EG103B and EG203B**

(basic version)  
 Product set at current time and date when delivered.  
 Automatic change of summer / winter time.

Programming key :

- to allow easy back up and re-installation of the program to allow permanent program overrides.
- programming per day or group of days
- 56 ON/OFF programme steps
- permanent ON/OFF overrides
- temporary ON/OFF overrides
- bar graph indication showing the daily profile
- programming supply.

**Operating voltage**

230V~ 50/60Hz

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat. ref.
<b>1 channel daily cycle</b>	5 adjustable pre-recorded programs : 6 commutations max per day (3 ON and 3 OFF) 230V 50/60 Hz	1	1	<b>EG010</b>
	capacity : 20 program steps 230V 50/60 Hz	3	1	<b>EG110</b>
<b>2 channels daily cycle</b>	capacity : 20 program steps to be divided between the 2 channels 230V 50/60 Hz	3	1	<b>EG210</b>
<b>1 channel weekly cycle</b>	capacity : 20 program steps 230V 50/60 Hz	1	1	<b>EG071</b>
	capacity : 20 program steps 230V 50/60 Hz	3	1	<b>EG170</b>
	capacity : 56 program steps output : 1 changeover contact μ 16A - 250V~ AC1	2	1	<b>EG103B</b>
	capacity : 56 program steps output : 1 changeover contact μ 16A - AC1 - 12/24 V AC/DC 50/60 Hz	2	1	<b>EG103V</b>
<b>2 channels weekly cycle</b>	capacity : 20 program steps to be divided between the 2 channels 230v 50/60 Hz	3	1	<b>EG270</b>
	capacity : 56 program steps output : 2 changeover contacts μ 16A - 250V~ AC1	2	1	<b>EG203B</b>



EG071



EG210



EG203E

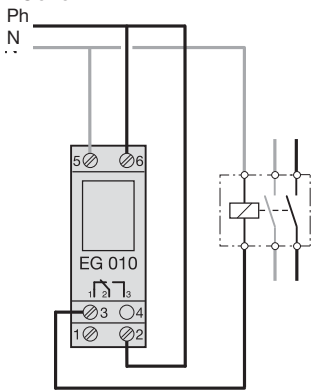
## Technical specifications

	EG010	EG110	EG210	EG071	EG170
<b>Width in ■ 17.5mm</b>	1	3	3	1	3
<b>Version</b>	daily	daily	daily	weekly	weekly
<b>Electrical characteristics</b>					
voltage supply	230V +15/-15% 50/60Hz		230V +15/-15% 50/60Hz	230V +15/-15% 50/60Hz	
consumption	1VA				
output	changeover contact				
<b>Switching capacity</b>					
AC1	16A/250V				
inductive load (cos $\varphi$ = 0.6)	3A/250V				
incandescent lamps	1000W				
<b>Characteristics</b>					
accuracy	+/- 1 sec per day				
supply failure reserve	Lithium battery total of three years				
manual override	permanent ON/OFF	permanent ON/OFF temporary ON/OFF		permanent ON/OFF	permanent ON/OFF temporary ON/OFF
<b>Environment</b>					
ingress protection	IP20				
working temperature	-10 to +50°C				
storage temperature	-10 to +50°C				
connection	0.5 to 4mm <sup>2</sup>				

	EG103B	EG203B
<b>Width in ■ 17.5mm</b>	2	2
<b>Cycle</b>	weekly	weekly
<b>Channels</b>	1	2
<b>Program step</b>	56	56
<b>Min. switching time</b>	1 min	
<b>Electrical characteristics</b>		
voltage supply	230V +15%/-15% 50/60Hz	
consumption	max 6VA	
output	changeover contact	
<b>Switching capacity</b>		
AC1	μ16A/250V	
inductive load (cos $\varphi$ = 0.6)	μ10A/250V	
incandescent lamps	2300W	
halogen lighting 230V	2300W	
compensated fluo. tubes //	400W, C=45μF	
non compensated fluo. tubes	1000W	
compact fluorescent tubes	500W	
min. load switching	100mA/250V	
<b>Characteristics</b>		
accuracy	± 1,5 second per day	
supply failure reserve	lithium battery : 5 years	
manual override	permanent ON/OFF temporary ON/OFF	
<b>Environment</b>		
ingress protection	IP20	
working temperature	-5 to 45°C	
storage temperature	-20 to +70°C	
<b>connection</b>	flexible: 1 to 6mm <sup>2</sup> rigid: 1.5 to 10mm <sup>2</sup>	

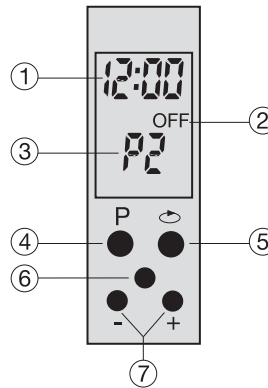
**Electrical connections**

**EG010**



**5 pre-registered programs:**

P	Prog
P0	OFF
P1	ON
P2	6.00 — 23.00
P3	6.00 8.00 17.00 23.00
P4	6.00 8.00 11.00 13.00 17.00 23.00



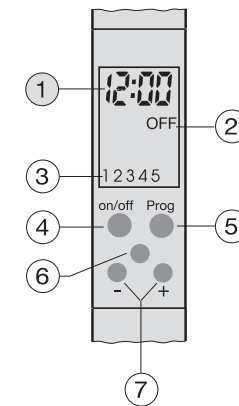
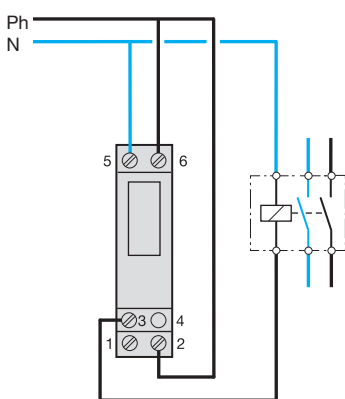
**Display :**

1. Time
2. Output contact (ON or OFF)
3. Program selected

**Buttons :**

4. To select the program to apply
5. To scroll program steps
6. Reset
7. + and - : change time settings

**EG071**



**Display :**

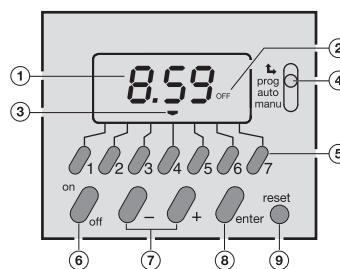
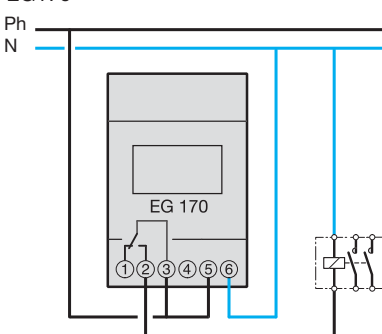
1. Time
2. Circuit status
3. Days

**Buttons :**

4. To select the program to apply
5. To scroll program steps
6. Reset
7. + and - : change time settings

	EG010	EG071
<b>Electrical characteristics</b>		
voltage supply	230V ±10% 50/60Hz	
consumption	1 VA	
output	1 changeover contact, 16A - 250V AC, 3A - 250V cos φ = 0,6, 1000W incandescent lighting	
<b>Functional characteristics</b>		
number of programs	5 adjustable pre-recorded programs	20 program steps (each program step can be applied to one of several days)
accuracy	± 6 min per year	
supply failure reserve	total of 3 years	
<b>Environment</b>		
working temperature	-10°C to +50°C	
storage temperature	-10°C to +60°C	
<b>Cable capacity</b>	1 to 4mm <sup>2</sup>	
<b>Main characteristics</b>	5 programs are pre-recorded. The user just has to select the program which corresponds to its use and modify time switches if necessary	

**EG170**



**Display :**

1. Time
2. Circuit status (ON or OFF)
3. Day of the week (1=Monday, 2= Tuesday,...)

**Buttons :**

4. Mode selector : to select one of the following modes :
  - time setting
  - programming
  - running mode
  - manual override
5. "1" to "7" : selection of the days
6. "ON/OFF" : chooses whether the circuits is ON or OFF.
7. "+" and "-" : changes settings
8. "enter" : to confirm selection
9. "reset"

## Indicator lights and push buttons

These products are used for remote controlling signalisation of any event in any electric installation (domestic, tertiary & industrial)





LED technology providing longer life, new design, integrated label holder

Connection capacity :  
- 10 mm<sup>2</sup> rigid,  
- 6 mm<sup>2</sup> flexible

Comply with IEC 62094-1 (for indicator lights).



SVN122 SVN125 SVN121  
SVN123 SVN124

Designation	Characteristics	Width in ■ 17.5mm	Pack qty.	Cat. Ref.
<b>Single indicator light</b> <b>230 V ~</b> 	LED light : green	1	12	<b>SVN121</b>
	red	1	12	<b>SVN122</b>
	orange	1	12	<b>SVN123</b>
	blue	1	12	<b>SVN124</b>
	clear	1	12	<b>SVN125</b>
<b>Double indicator light</b> <b>230 V ~</b> 	LED light: green and red	1	12	<b>SVN126</b>
	clear	1	12	<b>SVN128</b>
<b>Triple indicator light</b> 	LED light: red/red/red	1	12	<b>SVN127</b>
	red/orange/green	1	12	<b>SVN129</b>
	green/green/green	1	12	<b>SVN221</b>
	red/orange/blue	1	12	<b>SVN222</b>
<b>Low voltage indicator lights</b> <b>12 to 48 V</b> <b>AC/DC</b> 	LED light: green	1	12	<b>SVN131</b>
	red	1	12	<b>SVN132</b>
	orange	1	12	<b>SVN133</b>
	blue	1	12	<b>SVN134</b>
	clear	1	12	<b>SVN135</b>
	green/red	1	12	<b>SVN136</b>

## Push buttons






























2 versions :  
 - impulse push buttons  
 - latching push buttons

These versions with indicator lights are equipped with green or red diffuser. (led technology)

### Connection capacity :

- 10 mm<sup>2</sup> rigid,  
 - 6 mm<sup>2</sup> flexible.

Comply with IEC 60947-5-1 for push buttons and IEC 62094-1 for indicator lights

	Designation	Characteristics	Width in ■ 17.5mm	Pack qty.	Cat. Ref.
 SVN311	<b>Impulse push buttons</b>				
		<b>16 A - 250 V AC without indicator light</b> contact: 1NO	1	12	<b>SVN311</b>
		contact: 1NC	1	12	<b>SVN321</b>
		contacts: 2NO	1	12	<b>SVN331</b>
		contacts: 2NC	1	12	<b>SVN341</b>
		contacts: 1NO+1NC	1	12	<b>SVN351</b>
 SVN391		contacts: 2NO	1	12	<b>SVN371</b>
		contacts: 2NO + green push button	1	12	<b>SVN373</b>
		contacts: 1NO+1NC	1	12	<b>SVN391</b>
	<b>with indicator light :</b>				
		contact: 1NO green	1	12	<b>SVN411</b>
		contact: 1NC red	1	12	<b>SVN422</b>
 SVN411		contacts: 2NO red	1	12	<b>SVN432</b>
		contacts: 2NC green	1	12	<b>SVN441</b>
		contacts: 1NO+1NC red	1	12	<b>SVN452</b>
	<b>16 A - 12/48 V AC/DC with indicator light</b>				
		contacts: 2NO green	1	12	<b>SVN461</b>
		contacts: 2 NO red	1	12	<b>SVN462</b>
 SVN422	<b>Latching push buttons</b>				
		<b>16 A - 250 V AC without indicator light</b> contact: 1NO	1	12	<b>SVN312</b>
		contact: 1NC	1	12	<b>SVN322</b>
		contacts: 2NO	1	12	<b>SVN332</b>
		contacts: 2NC	1	12	<b>SVN342</b>
		contacts: 1NO+1NC	1	12	<b>SVN352</b>
 SVN422	<b>with indicator light :</b>				
		<b>16 A - 250 V AC</b> contact: 1 NO green	1	12	<b>SVN413</b>
		contacts: 2 NO green	1	12	<b>SVN433</b>
	<b>16 A - 12/48 V AC</b>				
		contacts: 2NO green	1	12	<b>SVN463</b>
		contacts: 2 NO red	1	12	<b>SVN464</b>

## Electrical and mechanical characteristics

<b>General features</b>				
<b>Part number</b>	<b>SVN1... / SVN2...</b>	<b>SVN4...</b>		<b>SVN3...</b>
Designation	indicator lights	indicator lights	+ push buttons indicator lights	push buttons
Standard	IEC62094-1		IEC60947-5-1	
Light technology	LED light			
<b>Electrical characteristics</b>				
Rated insulation voltage	250V			
Rated impulse withstand voltage	4kV (2kV for 12-48V version)		4kV	
Operational voltage	230V AC (1)			
Frequency	50/60Hz			
Operational thermal current	n/a	16A		
Operational current @ 230V AC12	n/a	16A		
Operational current @230V AC14	n/a	10A		
LED power	0,8W (230V) 0,33W (48V) 0,08W (24V) 0,018W (12V)			
LED consumption	3,45mA (230V) 6,9mA (48V) 3,3mA (24C) 1,5mA (12C)		9,7mA (48VDC)4,6mA (24VDC) 2,1mA (12VDC)	
Conditional short circuit current	n/a	1000A with gl 10A fuse		
IP class	IP2X			
Degree of pollution	3			
<b>Connecting</b>				
Type of connection	cage terminals			
Connection capacity with flexible cable	0,75mm <sup>2</sup> to 6mm <sup>2</sup>			
Connction capacity with rigid cable	0,75m <sup>2</sup> to 10m <sup>2</sup>			
Terminal tightening torque	mini : 1,3Nm ; Max 2Nm : advised 1,65Nm rigid and 1,8Nm supple			
Case material	Thermoplastic (Polyamide) comply with IEC 695-2-2			
<b>Mechanical characteristics</b>				
Electric endurance in number of cycles	n/a	15000 (AC12); 6000 (AC14)		
Mechanical endurance in no. of operations	n/a	15000		
Life time	100000 h			
Operating temperature	-20 to +50°C			
Storage temperature	-40 to +80°C			
Climat environment	all climates			
Protection index IP	20			
Height	2000 m			
<b>Installation</b>				
Mounting	DIN rail EN50.022-35			
Mounting position	performances not affected if installed vertically, horizontally or flat			

(1) except 12 to 48V indicator light (SVN131, SVN132, SVN133, SVN134, SVN135)



## Description

The light sensitive switch controls light systems according to daylight level :

- the user sets the switching level
- the photo cell measures the external light level.

## Applications

Domestic and commercial premises.

Complies with EN60730

## Technical data

Supply : 230V +10%-15% 50Hz  
1 changeover contact 16A 250V

## Selection switch:

(EE 100, EE 101, EE 110)  
5 to 100 lux  
50 to 2000 lux

4 position override switch allowing :

- auto : normal operation mode
- on : permanently switched-on
- off : permanently switched-off
- test : setting mode for easy adjustment

A light indicator when installing shows the status "on" of the contact.



EE100



EE702



EE002



EE003

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat. Ref.
Twilight switch with surface cell EE 003	Adjustable 5 to 100 lux, 50 to 2000 lux Fixed ON/ OFF delay: 15 to 60s Changeover 16A AC1 250V~	3	1	<b>EE100</b>
Twilight switch with flush cell EE 002	Adjustable 5 to 100 lux, 50 to 2000 lux Fixed ON/ OFF delay: 15 to 60s Changeover 16A AC1 250V~	3	1	<b>EE101</b>
Programmable twilight switch with surface cell	Daily cycle electromech. switch	5	1	<b>EE110</b>
Programmable twilight switch with surface cell	Weekly cycle digital program 8 presetted programs	3	1	<b>EE170</b>
Programmable twilight switch with surface cell	Weekly cycle digital program free setting	3	1	<b>EE171</b>
Compact twilight switch IP 55 Integrated cell	10 or 30 lux ON delay: 40s/ OFF delay: 120s 8A AC1	-	1	<b>EE701</b>
	Adjustable: 2 to 2000 lux Adjustable: 1s to 120s 16A: AC1	3	1	<b>EE702</b>
Flush cell	IP54 for EE100, 101, 110 & 170	-	1	<b>EE002</b>
Surface cell	IP54 for EE100, 101, 110 & 170	-	1	<b>EE003</b>

**Technical specifications**

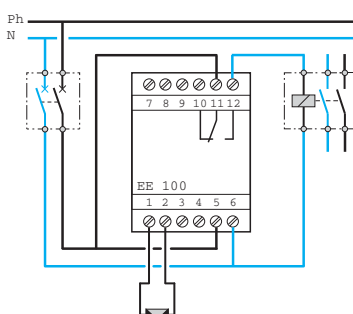
	EE100	EE101	EE110	EE170	EE171	EE700
Width in  17.5mm	3	3	5	3	3	-
Electrical characteristics						
voltage supply	230V +10/-15%					230V ±10%
frequency	50Hz					50/60Hz
consumption	1.5VA maximum					1VA
output	1 voltage free changeover contacts					1NO
Maximum switching capacity						
AC1	16A / 250V					10A
incandescent lamps	2000W					2300W
230V halogen lamps	1000W					
fluorescent lamps, non compensated	1000W					2300W
fluorescent lamps, compensated	200W					
fluorescent lamps compensated in series	1000W					
duo fluorescent lamps	1000W					
Functional characteristics						
lighting level : 2 ranges	5 to 100 lux and 50 to 2000 lux				2 to 1000 lux	
ON and OFF delay	15 to 60 seconds					ON 10s OFF 40s
mounting of cell	surface	flush *	surface	surface	surface	
programmable	no	no	yes	yes	yes	no
technology			electromechan.	digital		
cycle			24 hours	7 days**	7 days	
programming setting			15 min.	1 min.	1 min	
accuracy			+/- 6min/year	+/-6min/year	+/-6min/year	
operating reserve			accu	lithium battery	lithium battery	
			200h after beeing connected for 120h	total of 3 years of supply failure	total of 3 years of supply failure	
Environment						
working temperature	-30°C to +60°C (cell) -10°C to +50°C (modular device)					-25°C to +45°C
storage temperature	-20°C to +60°C					
Connection						
maximum length between cell and modular	50 meters					
capacity (modular device)	0.5 to 4 mm <sup>2</sup>					2.5 mm <sup>2</sup> max
capacity (cell)	0.75 to 4 mm <sup>2</sup>		0.75 to 4 mm <sup>2</sup>			

Note : \* delivered with a 1m cable (2x0.75)  
\*\* 8 predefined programs

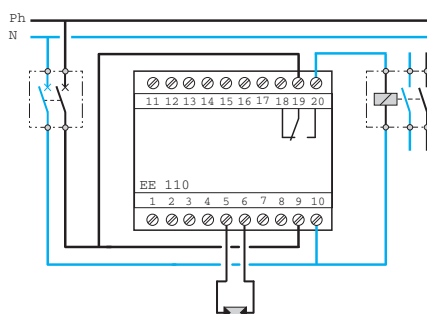
Cells	EE002	EE003
Type	flush mounting	surface mounting
Dimension (mm)	89 x 48 x 32	25 x 25 x 20 hole ø 25mm
Connection	cable 1m 2 x 0.75 mm <sup>2</sup>	0.75 to 4 mm <sup>2</sup>
Protection class	IP54	IP54
Working and storage temperature	-30°C to +60°C	-30°C to +60°C

**Wiring diagram**

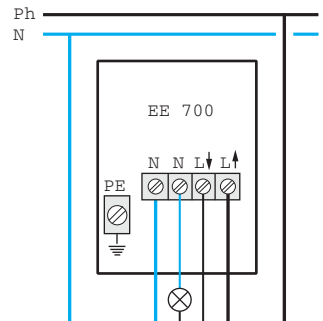
EE100 - EE101 - EE171



EE110



EE700



**Description**

Multi-function meter measures the extent of electrical values for all LV or LV/HV networks. It allows starting from the front panel to configure and display all the electric parameters and to exploit the functions of measurement, metering and energies management, harmonics analysis, remote control and control state of control devices, communication and detection of high voltages, peaks and voltage disconnections. This device is a multi-function meter for measuring electrical values for single, two and three phase low and high voltage networks.

**SM102E:**

- measurement in real effective values (TRMS) of:
- current per phase and neutral in instant and maximum value,
  - phase-to-neutral and phase-to-phase voltages, In instant,
  - frequency, In instant,
  - active positive power total in instant and maximum value,

- reactive positive power total in instant and maximum value,
- apparent positive power total in instant and maximum value,
- power factor (PF) total with inductive or capacitive indication
- harmonic distortion rate (THD) up to 51 on phase-to-neutral and phase-to-phase voltages and currents (THD 3U, THD 3V, THD 3I)

**Energies meters**

- positive active energy meter
- positive reactive energy meter
- programmable hour run meter

**SM103E:**

- Same measures as for SM102E with average values,
- active and reactive power on 4 quadrants ( $\pm$ ),
- harmonic distortion rate (THD) up to 51 on phase-to-neutral and phase-to-phase voltages and currents (THD 3U, THD 3V, THD 3I, THD In),

**Metering:**

- active and reactive power meter on 4 quadrants,
- apparent power meter,
- programmable hour run meter.

**Common equipments:**

- backlit LCD screen,
- direct access key for currents (instantaneous and max. values), current THD and set up wiring correction,
- direct access key for voltages, frequency and voltage THD,
- direct access key for active, reactive and apparent power (instantaneous and max. values) and power factor,
- direct access key for energies and hour meters.

**Connection capacity:**

- voltage: rigid or flexible conductors 2,5 mm<sup>2</sup>
- current: rigid or flexible conductors 6 mm<sup>2</sup>

Comply with IEC 61 557-12, IEC 62 053-22 class 0.5 S and IEC 62 053-23 class II

Designation	Characteristics	Cat. Ref.
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<b>Low voltage multi-function meters</b>	measures of instantaneous and maximum values	<b>SM102E</b>
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SM102E

<b>Low and high voltage multi-function meters and network analyser</b>	measures of instantaneous, average and maximum values	<b>SM103E</b>
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<b>Pulse output module</b> 2 pulse outputs cable for configuration (kWh, kvarh, kVah)	for meter SM102E with 1 adjustable output	<b>SM200</b>
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	for meter SM103E SM201 with 2 adjustable outputs	<b>SM201</b>
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<b>Input / output module</b> 2 inputs, 2 outputs cable for configuration on various measures	for meter SM103E SM202 (3 modules max. can be connected)	<b>SM202</b>
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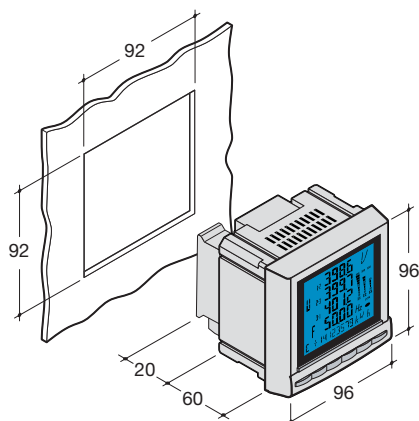
SM103E

<b>Analogue outputs module</b> 2 outputs cable for configuration on various measures	for meter SM103E (2 modules max. can be connected)	<b>SM203</b>
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## Technical characteristics

	SM102E	SM103E
Current measurement on insulated inputs (TRMS)		
CT primary	10 000 A	10 000 A
CT secondary	5 A	1 and 5 A
Measurement range	0-11 kA	
Input consumption	0.6 VA	≤ 0.1 VA
Accuracy	0.2 %	
Sustained overload	6 A	
Intermittent overload	10 x I <sub>n</sub> for 1 s	
Voltage measurement (TRMS)		
Direct measurement between phases	50 - 500 V	18 - 700 V
Direct measurement between phases and neutral	28 - 289 V	11 - 404 V
Frequency	50/60 Hz	
Input consumption	≤ 0,1 VA	
Accuracy	0.2 %	
Power measurement accuracy	0.5 %	
Power factor measurement accuracy	0.5 %	
Frequency measurement range	45 - 65 Hz	
Frequency measurement accuracy	0.1 %	
Active energy accuracy	class 0.5 S	
Reactive energy accuracy	class 2	
Measurement updating period	1 s	
Copper conductor connection capacity	flexible or rigid: 2,5 mm <sup>2</sup>	
- voltage	flexible or rigid: 6 mm <sup>2</sup>	
- current		
Auxiliary		
Power supply		
- AC voltage	110 - 400 V AC ± 10 %	
- DC voltage	120 - 350 V DC ± 20 %, 12 - 48 V DC -6 to +20 %	
Frequency	50/60 Hz	
Consumption	≤ 10 VA	

## Dimensions



# Automatic detection

## Optimized control & energy consumption

The motion detector range is particularly adapted to building external lighting automation. It brings a lot of benefits, such as: comfort, safety and energy saving.

Matching with different detection and installation specifications, the detectors are available with a mounting set for wall and ceiling.



Motion detector	70
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360° detector	71
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### Features :

- Large range: from 200° basis to 220/360° comfort
- An IP55 reinforced waterproofing
- Detection head with overmoulded fresnel lenses and pyro detectors
- Vertical and horizontal orientation and shutters to adjust the detection area
- Local setting time and lux via potentiometers and quick set feature to ease the setting
- Installation and wiring with quick connect terminals
- Wall mounting with a wall bracket that offers numerous wiring and mounting possibilities

### Technical

Power supply:

#### Basic detector

230 VAC + 10% (50/60 Hz)  
10A AC1 relay and cutted phase  
Enhanced detector  
230 VAC + 10%/ -15%

#### Output:

16A AC1 relay potential free

	Designation	Detection angle	Colour	Pack qty.	Cat. ref.
 EE830	<b>Basic range</b> Lumimat S220 white/ Motion dector	200°	white	1	<b>EE830</b>
	Lumimat S220 anthracite/ Motion dector	200°	anthracite	1	<b>EE831</b>
	Lumimat S360 white/ Motion dector	360°	white	1	<b>EE840</b>
	Lumimat S360 anthracite/ Motion dector	360°	anthracite	1	<b>EE841</b>
 EE840	<b>Enhanced range</b> Lumimat E220 white/ Motion dector comfort	220°	white	1	<b>EE860</b>
	Lumimat E220 white/ Motion dector comfort	220°	anthracite	1	<b>EE861</b>
	Lumimat TWIN white/ Motion dector comfort	220° + 360° = Twin	white	1	<b>EE870</b>
	Lumimat TWIN anthracite/ Motion dector	220° + 360° = Twin	anthracite	1	<b>EE871</b>
 EE870 EE871	<b>Accessories</b>				
	IR remote control		/	1	<b>EE806</b>
 EE806	Corner bracket for Lumimat S140/S200		white	1	<b>EE825</b>
			anthracite	1	<b>EE826</b>
 EE825	Ceiling bracket for Lumimat S140/S200		white	1	<b>EE827</b>
			anthracite	1	<b>EE828</b>
	Corner bracket for Lumimat S140/S220/TWIN		white	1	<b>EE855</b>
			anthracite	1	<b>EE856</b>

**Description**

Standard detectors are designed for automatic control of lighting for private/ public industry sectors and residential applications. They automatically switch on lighting if a person in motion is detected. The lights turn off after a preset duration. These detectors provide comfort and safety on the ways around a house, in the halls of passage. They also save energy by turning on the lighting only when it is necessary.

**Technical data**

- surface mounting
- 230 V AC, 50/60 Hz
- brightness: 5 to 1000 lux
- time delay setting: 5s to 15 min
- resistive potential free relay contact: 8A AC1 for enhanced.
- high sensitivity of detection
- remote control fro enhanced version.
- detection areas from 140° up to 360° by using mounting accessories.

**Connection capacity**

- 2.5mm<sup>2</sup> max rigid and flexible wires

**Complies with**  
IEC 60 669-1 and  
IEC 60 669-2-1

Designation	Characteristics	Pack qty.	Cat.Ref
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EE804

**Indoor motion detectors  
IP21**

360° surface mounting

1

**EE804**

360° flush mounting

1

**EE805**



EE805



EE883

**HF motion detector  
(hyper frequency)  
IP54**

- 1 way, 10A AC1
- detection distance from 1-8m
- Standards: EN 60669-2-1
- RF Standard ETSI EN 300 440- 1V1.3.1
- Frequency 50Hz
- Transmitter frequency: 5.8 GHz +/- 0.075 GHz
- Transmitter power: max. 1 mW
- Capture area 360°
- Back End/ Front End Protection: IP54

1

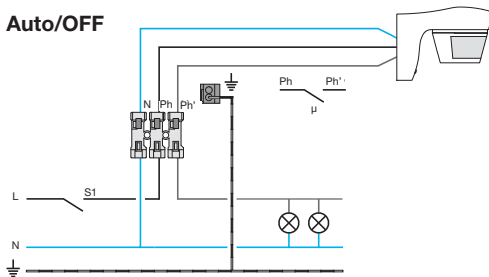
**EE883**



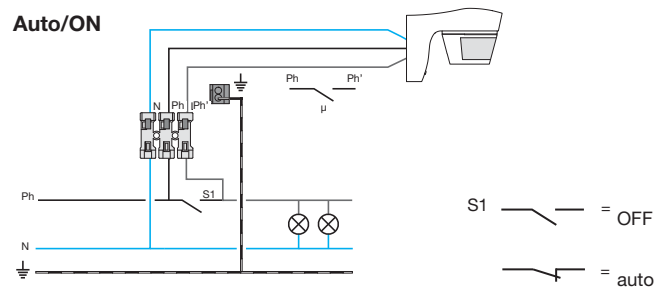
Technical characteristics

	EE820 / EE830 / EE840	EE821 / EE831 / EE841
<b>Functional characteristics</b>		
colours	white	anthracite
detection range	140° / 200° / 360°	
vertical head orientation	tilt 0 to 30°	
horizontal head orientation	pan ± 80°	
shutters	delivered with the products	
ceiling mounting	w/ accessory EE827 (except EE840)	w/ accessory EE828 (except EE841)
corner mounting (inner/outer corner)	w/ accessory EE825 (EE855 for EE840)	w/ accessory EE826 (EE856 for EE841)
<b>Settings</b>		
lux setting via potentiometer	5 to 1000 lux	
timer setting via potentiometer	pulse ( 1s ON, 9s OFF) or timer 5s to 15 min	
quick setting	auto/test position	
<b>Electrical characteristics</b>		
power supply	230V AC (+10% / -15%), 50Hz/60Hz	
output	10A AC1 , relay cutted phase	
<b>Load type</b>		
incandescent load	1500W	
VLV halogen lamps with conventional transformer	1500VA	
fluorescent tubes with parallel compensation C= 32µF	290W	
electronic ballast	580W	
fluocompact	10 x 20W	
<b>Environment</b>		
IP	55	
IK	04	
working temperature	-20°C to +55°C	
storage temperature	-20°C to +60°C	
<b>Connection</b>		
terminals	quickconnect with manual release	
terminals capacity	1.5 mm <sup>2</sup> rigid wires	

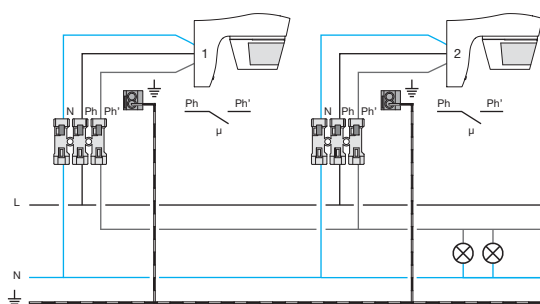
Auto/OFF



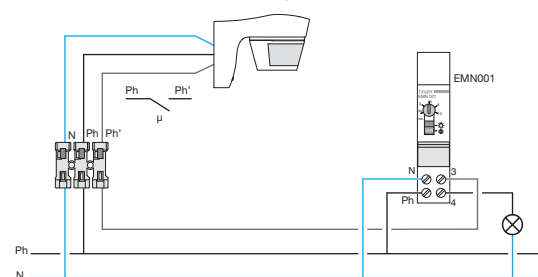
Auto/ON



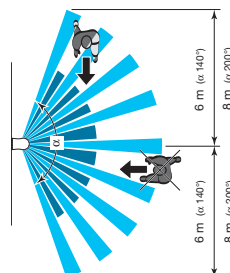
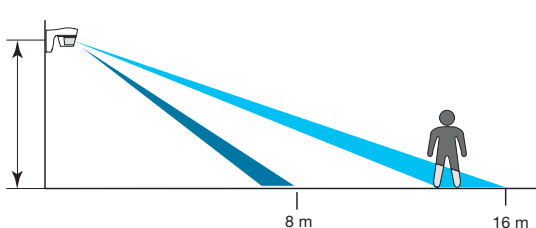
Detectors in parallel



Combination with a timelag



Detection zone



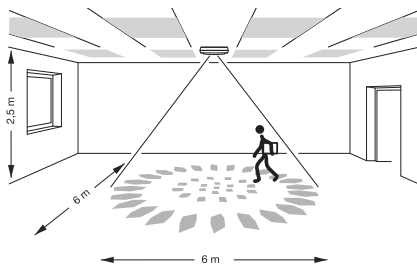
The optimal height of installation is 2.5 m.  
The detection field must remain free.

EE82x: = 140°  
EE83x: = 200°

## Technical specifications

	EE804	EE805
mounting	wall mounted	flush mounted
voltage supply	230 V AC	
frequency	50 Hz	
brightness level	5 to 1000 lux	
lighting output operating time	5 s. to 15 mn	
breaking capacity AC1	10 A	
- incandescent	1000 W	
- halogen 230 V	1000 W	
- halogen ELV via ferro.transfo.	500 VA	
- halogen ELV via electro.transfo.	500 VA	
- non compensated fluorescent tubes	1000 W	
- compensated fluorescent tubes	2 x 58 W or 3 x 36 W or 6 x 18 W	
- electronic ballast	8 x 58 W	
- fluocompact	10 x 20 W	
terminal capacity	1 to 2,5 mm <sup>2</sup>	
IP	IP21 / IK03	
working temperature	0°C to + 45°C	
product dimension	EE804 : Ø 105 x p.54	EE805 : Ø 85 x p.80

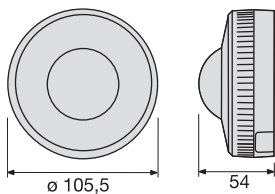
### Detection area EE804 - EE805



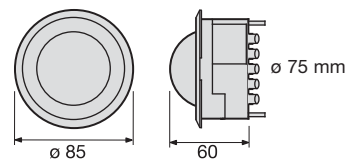
### Mounting - Motion detectors 360° EE804 - EE805

ceiling mouting  
They are particularly intended for use in interior traffic areas such as corridors, entrance halls...

### Dimensions EE804

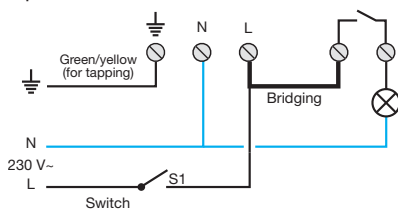


### EE805



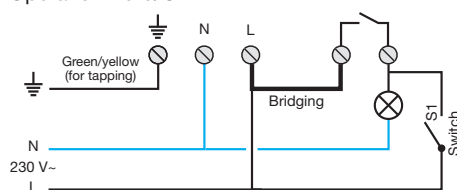
### Electrical connections EE804

Operation Auto/OFF



S1 Open = stop  
S1 Closed = automatic mode.

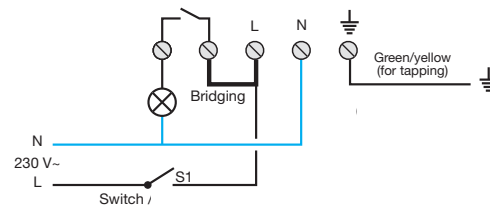
Operation Auto/ON



S1 Open = automatic mode  
S1 Closed = permanent switch on

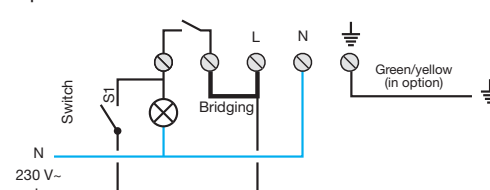
### EE805

Operation Auto/OFF



S1 Open = stop  
S1 Closed = automatic mode

Operation Auto/ON



S1 open = automatic mode  
S1 closed = permanent switch on.

# Solutions for energy efficiency



**hager**



## Lighting management by Hager

There is always a solution to customize the lighting to the right need and generate savings in housing and commercial premises.

[www.hager.hk](http://www.hager.hk)



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