

2024 Update
New Products included

Catalogue

Commercial Distribution



:hager

Innovative Electrical Solutions

As an independent family-owned and run company Hager Group is one of the industry's leading innovators for commercial and residential applications. With 11,400 employees globally, our components and solutions are produced in 25 different locations to support our customers projects in more than 136 countries around the world.

In the UK we have a well-established research and development team combined with global resource to meet the needs of the market. This is backed up by the UK factory having ISO 9001:2015 and an on-site ASTA recognised laboratory to BS EN ISO/IEC 17025:2005, which ensures that products and solutions meet all of the relevant British standards. The UK site also has OHSAS 18001:2007, ISO 14001:2015 and the Investors in People Bronze Award.

Working out solutions in close consultation with customers we have the vision 'to add value to peoples' lives and their buildings through smart, eco-efficient and energy saving solutions and services'.



Type A & B Distribution Boards



Our Invicta 3 Type B Boards have been developed as the solution for commercial installations. The whole nature of electrical sub and final distribution for commercial installations has changed in recent years, with demands for more outgoing ways, more RCD protection, more metering and more control devices.

In The Range

SP&N / TP&N
Invicta 3 125A / 250A
IP65
Incomer Kits
Meter Packs
Dual / Tri Metered Boards
Hybrid
Extension / Cable Spreader Boxes

Panelboards



Invicta 3 Panelboards are incredibly easy to install, the pan assembly, door and front cover can all be removed to make the product lighter when fixing to the wall. Keyhole slots and a central fifth keyhole fixing point make fitting and levelling the board even simpler.

In The Range

Invicta 3 250A / 400A / 630A / 800A
Incomer Kits
Meter Packs
Meter Enclosures
Extension / Cable Spreader Boxes
Panel & DIN Rail Meters
CTs & Meter Cables

Metering & Monitoring



UK wiring regulations and local building regulations create additional requirements for electrical distribution boards in commercial building applications. A range of incoming device options and scalable energy metering options ensure specific application requirements are met. Easy to specify and install, our metered distribution board options create scalable solutions for typical commercial building applications.

In The Range

- Side / Top / bottom / Corner Meter Enclosures
- Panel Meters
- DIN Rail Mounted Meters
- CT to Plug-in Converter
- Plug-in CTs
- Meter Cables

Protection Devices



For integration in to Electrical distribution systems in commercial building applications, our electrical distribution boards are available with a range of protective device incomer options. SD, MCCB and RCCB incomers are available. In addition, 4P changeover units are available for 125A Type B boards. Outgoing devices for MCB boards also include a wide range of RCBO devices covering 10mA, 30mA and 100mA applications in B and C curve.

In The Range

- MCBs
- RCBOs
- RCCBs
- Motor Starters
- Fuse Carriers
- Surge Protection
- Earth Fault Relays
- MCCBs



A thoughtful approach to Surge Protection

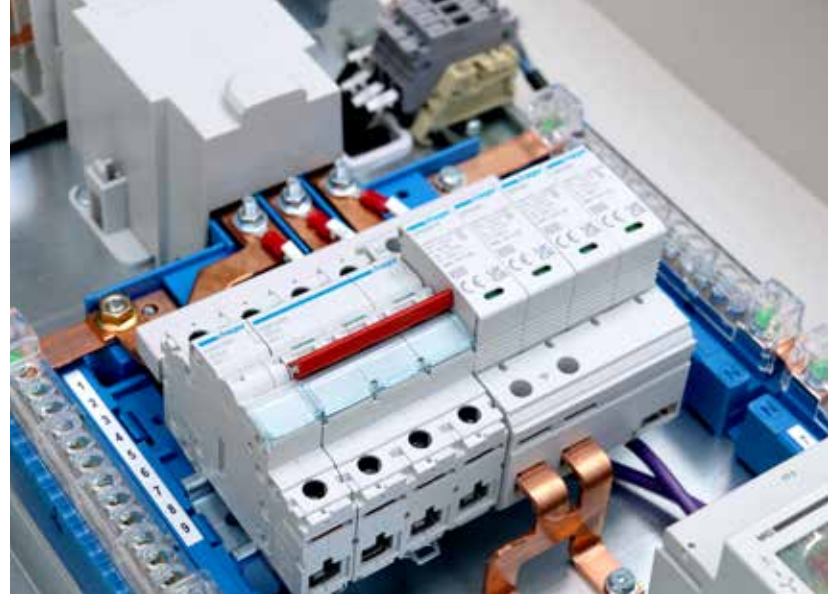
We have developed a brand new range of dedicated SPD kits, specifically for our Commercial Distribution boards.

Our kits have been created to provide optimum end equipment protection against surge transient voltages after an increased focus on this requirement in the 18th Edition wiring regulations.

Space saving integration.

Where required, board designs have been changed to enable all kits to fit within the actual distribution board, rather than in a separate enclosure next to the distribution board. This also allows for the shortest possible connection to the SPD from the incoming supply, providing optimum performance.

Our SPD kits have the additional benefit of not requiring any additional upstream protection devices, saving more space in the board for protection devices.

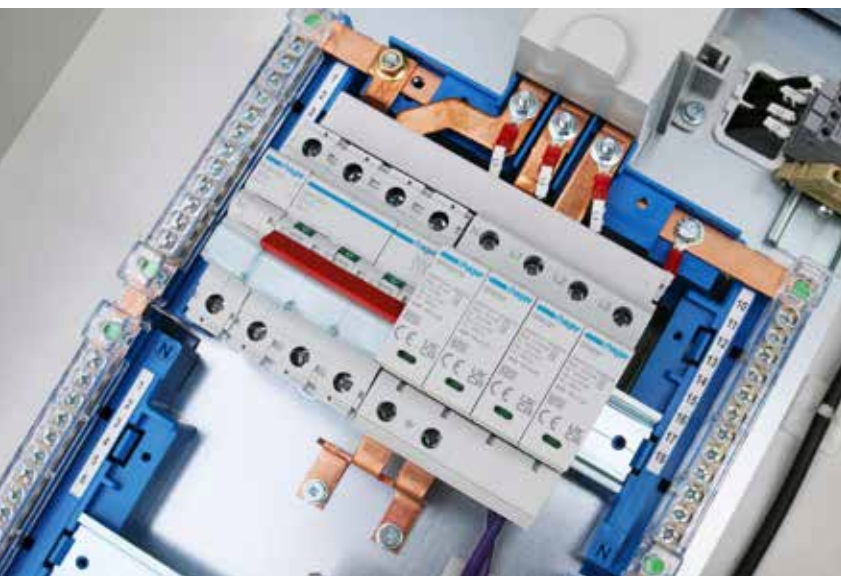


Integrated testing

The wiring regulations advise that SPD's should be selected from one manufacturer to ensure that they work well together. Our Type 1 Panelboard SPDs have been tested to ensure coordination with Type 2 SPDs in TP&N boards.

We've developed our boards and SPD kits together and tested the effective performance of how well high voltage transients are managed down to levels that don't harm electrical equipment

Through development testing, we have removed the need to consider many of the application & installation variables that previously made SPD selection and installation complicated.



A solid connection

Through extensive testing we know that removing secondary protective devices, using short conductor paths to SPD's and replacing cables with solid copper Earth links dramatically improves the effectiveness of the SPD.

Without these features our testing has shown that common installation variables can easily lead to a very significant reduction in the effective performance of the SPD, potentially leaving surge voltages at a level that can damage end equipment

Type B TP&N Distribution Boards

Invicta 3 Type B boards have been designed for safe and simple installation, with features to benefit both installer and end user.

Take a look below to see all of the features we have designed in and how this is going to make installing a distribution board so much easier.



01 Aesthetics

Strong board aesthetics ideal for commercial offices, health care and education projects where boards may be sited in public areas.



02 Metering

A number of metering options provide a scalable solution to energy monitoring. Type B Distribution boards are also available with dual channel meters for separate monitoring of Power and lighting loads. A metered three section Type B board is also available to monitor power and lighting and mechanical services.



03 Trunking Entry

Unique trunking entry obround system top and bottom enables quick fitting to trunking and without the extra cost in time and materials. The edge is curved, ready to bring cables in without the worry of sharp edges.



04 Hybrid TP&N Board Available

Our Invicta TP&N Hybrid Distribution Board is available to provide two 3 phase loads of up to 125A or six single phase loads. The larger 80-125A MCB devices, whilst providing short circuit and overload protection, also give a disconnection point for downstream circuits (isolation). This ensures that there are no unprotected outgoing connections from the busbar system.



05 Shrouded Neutral Bar

Clear shrouded neutral bar to IP2X allows the contractor to install cables without removing the shroud. Ensures safe and easy installation.

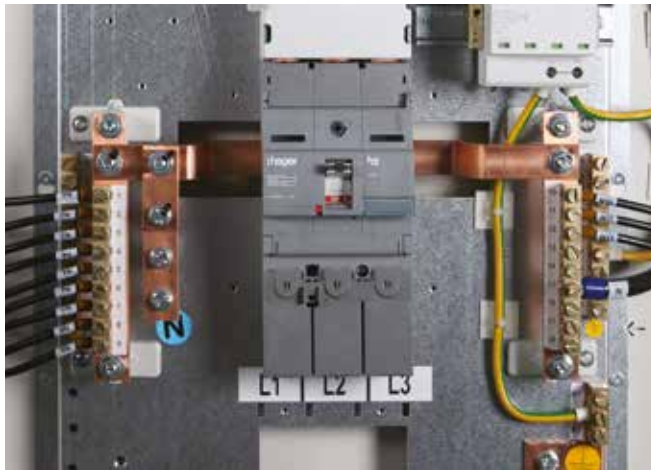
Invicta Panelboards

Our Invicta 3 Panelboards have been designed to make installation a breeze, take a look below for a brief overview of all of the features.



01 The Perfect Match

Our Invicta 3 panelboards have been designed to match perfectly with the Invicta 3 Type B distribution boards. The Invicta 3 Panelboard range is the most aesthetically pleasing available on the market, with its glazed door and curved edges.



02 Twin Earth & Neutral Bars

Allows easy identification of earth & neutral conductors with corresponding line conductors.



03 Removable Pan Assembly

To lighten the product when fixing to the wall, pan assemblies can also be purchased as a separate part or removed for fitting into cubicle switchboards.



04 Energy Metering

The installer only has to fit the packs into the board. All internal wiring is included. RJ45 connectors simplify the connection of CTs to meters.



05 Removable Gland Plates

The top and bottom removable gland plates allows cable entries to be prepared away from the board, preventing ingress of swarf etc.

Metered Power & Lighting Board

Monitoring Power and Lighting loads separately, creates a better understanding of the where electricity is being consumed. Our power and lighting boards employ dual channel meters and are supplied with the main incoming device pre-installed. Available as standard in a variety of configurations and sizes to suit most applications up to 24TP ways. A Tri-metered TPN board is also available as standard, where separate monitoring of Power, Lighting and Mechanical services loads in required.

01 Energy Saving



Installing and monitoring meters leads to savings of 5-10% of the energy being metered. For example, a meter that identifies pumps being left on for 24hrs, seven days a week, may save 60% of energy passing through if the pump is only used when required.

02 Building Regulations



The Building Regulations 2010 & approved document L2 recognise the valuable role of metering and include requirements of sub-metering in buildings other than dwellings.

03 Choice



There are many options to monitor energy consumption. Direct metering, measurement and estimation should all be considered.

04 Communication



Metering helps building occupiers to understand how energy is being used and lets them see the patterns of where and when energy is consumed. Useful trends can be shown from the data produced.

05 Control & Performance



Metering provides feedback to designers, manufacturers, government and the supply side industry on performance achieved, helping them to improve global energy performance by setting better targets.

Arc Fault Detection

What the regs say **BS EN 62606**

Arc fault detection devices (AFDD) shall be provided for single-phase AC final circuits supplying socket-outlets with a rated current not exceeding 32 A in:

- Higher Risk Residential Buildings (HRRB)
- Houses in Multiple Occupation (HMO)
- Purpose-built student accommodation
- Care homes

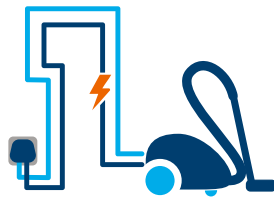
For all other premises, the use of AFDDs conforming to BS EN 62606 is recommended for single-phase AC final circuits supplying socket-outlets not exceeding 32 A.

Where used, AFDDs shall be placed at the origin of the circuit to be protected.

Parallel Arc Fault

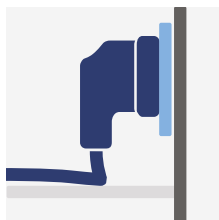


Series Arc Fault

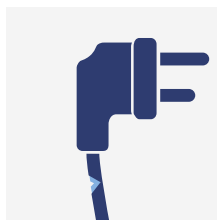


Potential Causes

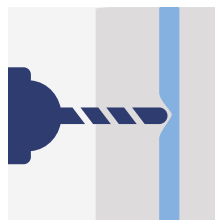
Arc faults can be caused by all types of line faults and worn contacts. An AFDD will trip the circuit when a potentially hazardous arc occurs, eliminating the resulting fire hazard.



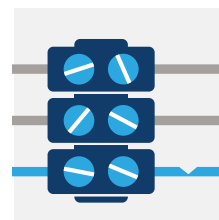
Kink/break in the cable



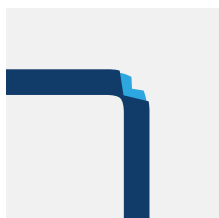
Cable wear due to frequent use



Line damage resulting from drilling or construction work



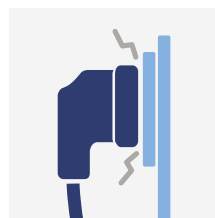
Incorrect wire stripping



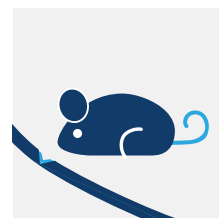
Incorrect bending radii



Loose screwed connections



Defective plugs



Rodent bites

For commercial applications, our AFDD can be wired in series with MCB's / RCBO's to create a flexible approach to AFDD integration.

Using any of our TPN Distribution board, standard din extension enclosures provide simple and scalable accommodation for AFDD requirements.

Note: our AFDD is an MCB + AFDD, so when used in series with another OCP device, it is likely that both devices will trip under an overcurrent event.

Greater breaking capacity 10 kA

Higher prospective fault currents require devices with higher breaking capacities. So in addition to the 6kA range of AFDD for residential applications, we now offer devices with a 10kA breaking capacity, making them more suitable for typical commercial building installations.

This microprocessor based technology has been evolved to ensure algorithms profiling typical UK final circuit loads, provide safe reliable operation.

Monitoring via Microprocessor

An AFDD is activated by both series and parallel arc faults. Unlike circuit breakers or RCDs, an AFDD does not have an electromechanical trigger, but utilises electronic technology to analyse the signature (waveform) of an arc. It reliably differentiates between an arc fault and the signature (waveform) in normal switching and control events, preventing false tripping.



Effective areas of protective devices depending on fault type.

Short Circuit	Overload	Earth Fault	Serial Arc	Parallel Arc
MCB / RCBO	MCB / RCBO	RCCB / RCBO	AFDD	RCCB / RCBO / AFDD

Auxiliary contact, alarm contact and shunt trip devices are available as supplements:

- MZ201, auxiliary contact 1C + 1O
- MZ202, alarm contact 1C + 1O
- MZ203, shunt trip 230–415 V AC



AFDD with extension accessories from the MCB and RCCB/MCB range

Commercial Distribution

Powering a building to its potential, it's what we do. We have the perfect solutions to help an office, factory or industrial site save energy and keep their occupants safe. From Panelboards to our range of enhanced TP&N boards with metering capabilities, our commercial offering will create the perfect electrical ecosystem for a building.



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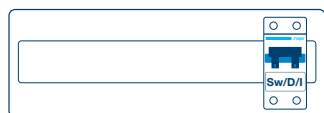


JK104

SP&N Distribution Boards

Characteristics:

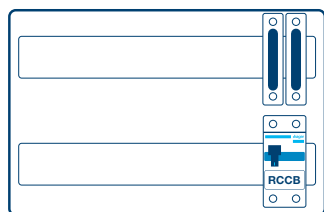
- SP&N distribution boards are available from 4-28 outgoing ways. The range comes with a choice of either 100A 2 pole switch disconnecter, 63A 30mA 2 pole RCCB Type A or 100A 30mA 2 pole RCCB Type A, or a range of split load versions.
- Conforms to BS EN 61439-3. $I_{nA} = 63A/100A$, $I_{nc} = 63A$, $I_{cc} = 10kA$
- Cable Sizes: 100A: 50mm², 63A: 16mm²
- Ample wiring space, with provision to accept RCBO's.
- Full complement of earth and neutral terminal bars to accept up to 16mm² cable.
- Suitable for cable entry on all sides and back.



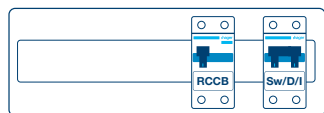
- 100A Switch Disconnecter Incomer
- 63A 30mA Switch Disconnecter Incomer



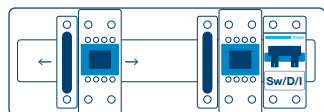
100A 30mA RCCB Incomer



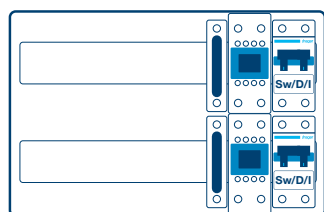
100A 30mA RCCB Incomer Dual Row



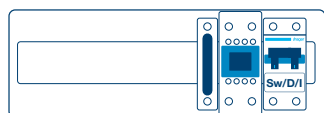
100A Switch Disconnecter Incomer & 63A 30mA RCCB



100A Dual Metered with MID Meter
- JKD114



100A Dual Metered with MID Meter -
JKD1111



100A Metered with MID Meter -
JKD117

Description	Size	Cat ref.
100A Switch Disconnecter Incomer		
4 Way 100A Switch Disconnecter Incomer	3	JK104
6 Way 100A Switch Disconnecter Incomer	3	JK106
10 Way 100A Switch Disconnecter Incomer	4	JK110
14 Way 100A Switch Disconnecter Incomer	5	JK114
20 Way 100A Switch Disconnecter Incomer	7	JK120
28 Way 100A Switch Disconnecter Incomer Dual Row	5 (2)	JK128
100A 30mA RCCB Incomer Type A		
4 Way 100A 30mA RCCB Incomer	3	JK304H
6 Way 100A 30mA RCCB Incomer	3	JK306H
10 Way 100A 30mA RCCB Incomer	4	JK310H
14 Way 100A 30mA RCCB Incomer	5	JK314H
20 Way 100A 30mA RCCB Incomer	7	JK320H
28 Way 100A 30mA RCCB Incomer Dual Row	5 (2)	JK328H
100A Switch Disconnecter and 63A 30mA RCCB Type A		
6 Way Split Load Configurable 100A Switch 63A 30mA RCCB	4	JK706C
10 Way Split Load Configurable 100A Switch 63A 30mA RCCB	5	JK710C
14 Way Split Load Configurable 100A Switch 63A 30mA RCCB	7	JK714C
100A Switch Disconnecter and 100A 30mA RCCB Type A		
28 Way Split Load 14+14 100A Switch 100A 30mA RCCB Dual Row	5 (2)	JK527H
100A Dual Metered with MID Meter		
14 Way Dual Metered 100A Configurable MID Pulsed, Modbus	7	JKD114
22 Way Dual Metered, Dual Row 100A MID Pulsed, Modbus	5 (2)	JKD1111
100A Metered with MID Meter		
17 Way Metered 100A MID Pulsed, Modbus	7	JKD117

The relevant part of the BS EN 61439 series applies to the integration of mechanical and electrical components (switching devices, control devices, busbars, functional units, etc.), into an enclosure. Hager systems such as consumer unit, distribution board and panel board ranges are certified to the appropriate part of the BS EN 61439 series. When selecting other device / enclosure arrangements our Tailored Solutions team can provide a verified solution - please contact technical support for assistance on 01952 675689.

DIN Rail Enclosures

Characteristics:

- One, two or three row 8-66 module enclosures, fitted with DIN rails to accept any combination of Hager devices. Ample wiring space, with provision to accept RCBO's.
- Conforms to BS EN 62208. $I_{nA} = 63A/100A$, $I_{nC} = 63A$, $I_{CC} = 10kA$
- Full complement of earth and neutral terminal bars to accept up to 16mm² cable.
- Suitable for cable entry on all sides and back.
- For dimensions see page 68.

Description	Size	Cat ref.
1 Row 8 Modules	3	JK008
1 Row 12 Modules	4	JK012
1 Row 16 Modules	5	JK016
1 Row 22 Modules	7	JK022
2 Row 24 Modules (2 x 12)	4 (2)	JK024
2 Row 32 Modules (2 x 16)	5 (2)	JK032
2 Row 44 Modules (2 x 22)	7 (2)	JK044
3 Row 66 Modules (3 x 22)	7 (3)	JK066



JK008

Invicta 3 SP&N Distribution Boards

Characteristics:

- Boards are available with 14 & 29 outgoing ways. The range comes with a 100A 2 pole switch disconnecter to accept 50mm² cable. Ample wiring space, with provision to accept RCBO's.
- Conforms to BS EN 61439-3. $I_{nA} = 63A/100A$, $I_{nC} = 63A$, $I_{CC} = 10kA$
- Full complement of earth and neutral terminal bars to accept up to 16mm² cable.
- Suitable for cable entry on all sides and back.
- Enclosures are available with plain or glazed doors.
- For dimensions see page 68.

Description	Cat ref. Plain Door	Cat ref. Glazed Door
1 Row, 14 Way 100A Switch Disconnecter Incomer	JK114A	JK114AG
2 Row, 29 Way 100A Switch Disconnecter Incomer	JK129A	JK129AG



JK114AG

Type A SP&N Distribution Board SPD Kit Type 2

- Consists of: 6mm earth cables, 1x double pole surge protection device with lifetime indicator & Busbar.
- Only suitable for Consumer units with Switch Disconnecter incomer & is not compatible with Consumer units with RCCB incomer.

Poles	I_n kA L-N	I_n kA N-PE	U_p kV	Width (mm)	Cat ref.
2	15	25	≤ 1.2	35	VME01SPD
2	5	15	≤ 1.2	35	VME02SPD



VME02SPD



JK106BG

¹ A **JK101SE** may be required to provide additional incoming cable space, see page 69.

² Full metal cover & door where required for domestic dwelling applications.

Invicta 3 125A TP&N Distribution Boards (125A Incoming, 63A Outgoing)

Characteristics:

- Surface mounted steel enclosures, IP3XD rated available with plain, glazed & Amendment 3 door options.
- Conforms to BS EN 61439-3, $I_{nA} = 125A$, $I_{nC} = 63A$, $I_{CC} = 25kA$
- Supplied without incoming & outgoing devices. A Hager incomer kit must be used.
- Incoming cable sizes: 125A & 100A 50mm², 63A 16mm²
- Option with factory fitted SPD Type 2 & 4 Pole SD incomer.
- For dimensions see page 69.

Description	Cat ref. Glazed door with SPD type 2 & 125A 4P Sw	Cat ref. Plain door	Cat ref. Glazed door	Cat ref. Residential Applications
4 Triple Pole Ways 125A TP&N Board	JK104BGSPD	JK104B ¹	JK104BG ¹	JK104BA3 ^{1 2}
6 Triple Pole Ways 125A TP&N Board	JK106BGSPD	JK106B ¹	JK106BG ¹	JK106BA3 ^{1 2}
8 Triple Pole Ways 125A TP&N Board	JK108BGSPD	JK108B ¹	JK108BG ¹	JK108BA3 ^{1 2}
12 Triple Pole Ways 125A TP&N Board	JK112BGSPD	JK112B	JK112BG	JK112BA3 ²
16 Triple Pole Ways 125A TP&N Board	JK116BGSPD	JK116B	JK116BG	JK116BA3 ²
18 Triple Pole Ways 125A TP&N Board	JK118BGSPD	JK118B	JK118BG	JK118BA3 ²
24 Triple Pole Ways 125A TP&N Board	JK124BGSPD	JK124B	JK124BG	JK124BA3 ²



JKD1416TM

125A Dual Metered Boards - MID Meter

Characteristics:

- Provides separate metered energy values for both Small Power and lighting grouped loads.
- Boards are supplied with a MID approved meter that communicates via a modbus output.
- Conforms to BS EN 61439-3, $I_{nA} = 125A$, $I_{nC} = 63A$, $I_{CC} = 25kA$.
- 125A TP switch disconnector pre-fitted. Each individual pan is fully rated at 125A.
- For dimensions see page 72.

Description	Max cable capacity solid	Lower pan ways	Upper pan ways	Cat ref.
4+6 Way Power & Lighting Board	50mm ²	4	6	JKD146TM
6+6 Way Power & Lighting Board	50mm ²	6	6	JKD166TM
6+4 Way Power & Lighting Board	50mm ²	6	4	JKD164TM
6+8 Way Power & Lighting Board	50mm ²	6	8	JKD168TM
8+8 Way Power & Lighting Board	50mm ²	8	8	JKD188TM
8+6 Way Power & Lighting Board	50mm ²	8	6	JKD186TM
4+16 Way Power & Lighting Board	50mm ²	4	16	JKD1416TM
16+4 Way Power & Lighting Board	50mm ²	16	4	JKD1164TM
8+12 Way Power & Lighting Board	50mm ²	8	12	JKD1812TM
12+8 Way Power & Lighting Board	50mm ²	12	8	JKD1128TM
12+12 Way Power & Lighting Board	50mm ²	12	12	JKD11212TM



JK106BD

IP65 Distribution Boards (Not suitable for outdoor use)

Characteristics:

- Suitable for three phase applications where a high IP rating is required.
- Conforms to BS EN 61439-3, $I_{nA} = 125A$, $I_{nC} = 63A$, $I_{CC} = 25kA$.
- Available with either a steel (mild steel, powder coated) or Glass Reinforced Plastic (GRP) enclosure.
- Supplied without incoming and outgoing devices. A Hager incomer kit must be used.
- Available up to 125A direct connection with outgoing distribution, rated for MCBs from 0.5A to 63A.
- JK***BD **are not** suitable for outdoor use.
- JK***BF **are** suitable for outdoor use.

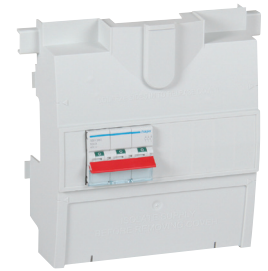
Description	Cat ref. Steel	Cat ref. GRP
4 Way IP65 Metal 125A TPN Board 800 x 600 x 300	JK104BD	JK104BF
6 Way IP65 Metal 125A TPN Board 800 x 600 x 300	JK106BD	JK106BF
8 Way IP65 Metal 125A TPN Board 800 x 600 x 300	JK108BD	JK108BF
12 Way IP65 Metal 125A TPN Board 1250 x 850 x 300	JK112BD	JK112BF
16 Way IP65 Metal 125A TPN Board 1250 x 850 x 300	JK116BD	JK116BF

MCBs & RCBOs for Invicta 3 Type B TP&N Distribution Boards - See pages 44-46 for more info

		0.5A	1A	2A	3A	4A	6A	10A
B Curve	Single Pole	-	-	-	-	-	NBN106A	NBN110A
	Triple Pole	-	-	-	-	-	NBN306A	NBN310A
C Curve	Single Pole	NCN100A	NCN101A	NCN102A	NCN103A	NCN104A	NCN106A	NCN110A
	Triple Pole	NCN300A	NCN301A	NCN302A	NCN303A	NCN304A	NCN306A	NCN310A
D Curve	Single Pole	NDN100A	NDN101A	NDN102A	NDN103A	NDN104A	NDN106A	NDN110A
	Triple Pole	NDN300A	NDN301A	NDN302A	NDN303A	NDN304A	NDN306A	NDN310A
RCBO (B Curve) Single Pole		-	-	-	-	-	ADB406U	ADB410U
RCBO (C Curve) Single Pole		-	-	-	-	-	ADC406U	ADC410U

Incomer Kits for 125A Boards

Description	Max Cable Capacity Solid	Cat ref.
3 Pole 100A Switch Disconnector Incomer Kit (Fits within distribution board)	50mm ²	JK11003S ⁴ Not SPD
4 Pole 100A Switch Disconnector Incomer Kit (Fits within distribution board)	50mm ²	JK11004S ⁴
3 Pole 125A Switch Disconnector Incomer Kit (Fits within distribution board)	50mm ²	JK11253S ⁴ Not SPD
4 Pole 125A Switch Disconnector Incomer Kit (Fits within distribution board)	50mm ²	JK11254S ⁴
4 Pole 63A Contactor Incomer Kit includes Switch Disconnector (fits below distribution board, 300mm high)	50mm ²	JK10634C ¹
4 Pole 100A Contactor Incomer Kit includes Switch Disconnector (fits below distribution board, 450mm high)	M8 Lug	JK11004C ³
125A Direct Connection Kit (Fits within distribution board)	50mm ²	JK11254D ⁴
4 Pole 100A 30mA RCCB Type A Incomer Kit (Fits within distribution board)	50mm ²	JK11004RH
4 Pole 100A 300mA RCCB Type A Incomer Kit (Fits within distribution board)	50mm ²	JK11004RL
4 Pole 100A 300mA Time Delayed RCCB Type A Incomer Kit (Fits within distribution board)	50mm ²	JK11004RLD
4 Pole 100A 100mA RCCB Type A Incomer Kit (Fits within distribution board)	50mm ²	JK11004RM
4 Pole 100A 100mA Time Delayed RCCB Type A Incomer Kit (Fits within distribution board)	50mm ²	JK11004RMD
125A 4 pole Changeover Incomer Kit (Fits within distribution board)	50mm ²	JK11254CO ³



JK11003S

³ A 300 / 450mm space is required below the board for fitting.



JKD125MID

Side by Side Incomer Kits for 125A Boards

Characteristics:

- Complete with 125A 3P SD incomer
- Cable sets to connect to distribution boards
- Suitable for all 125A TP&N board sizes

Description	Cat ref.
Dual kWh Meter Pack 125A Incomer Pulsed & Modbus	M8 Lug JKD125MID
Triple kWh Meter Pack 125A Incomer Pulsed & Modbus	M8 Lug JKD125TMID

Surge Protection Kits for 125A Boards (including 125A Dual metered boards)

Characteristics:

- SPD kit for direct integration within 125A TPN boards
- Low U_p value assured through use of solid busbar connectors and solid copper Earth
- SPD suitable for TN / TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earthing systems.
- Coordination verified with upstream Hager Panelboard SPDs.

Description	Cat ref.
Type 1 & 2 Surge Protection Kit for 125A TP&N Boards	JK101SPD
Type 2 Surge Protection Kit for 125A TP&N Boards	JK102SPD



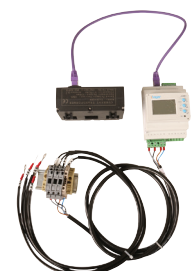
JK101SPD
(Incomer kit also required separately)

Meter Packs & Kits for 125A Boards - MID

Characteristics:

- **JKD1125MID** – This enclosed meter pack fits below any Hager standard 125A TPN boards. Can be used in conjunction with SPD kits – MID meter has Modbus and pulse comms 300mm high.
- **JK140MID** – This MID meter kits can be fitted within the TPN board, but is not suitable for 4 & 6 way boards. This kit can not be used, when an SPD is fitted – MID Meter has Modbus and pulse comms.

Description	Cat ref.
Meter Enclosure & MID Meter	JKD1125MID
Multifunction Meter Pack 125A Pulsed & Modbus	JK140MID



JK140MID

16A	20A	25A	32A	40A	45A	50A	63A
NBN116A	NBN120A	NBN125A	NBN132A	NBN140A	-	NBN150A	NBN163A
NBN316A	NBN320A	NBN325A	NBN332A	NBN340A	-	NBN350A	NBN363A
NCN116A	NCN120A	NCN125A	NCN132A	NCN140A	-	NCN150A	NCN163A
NCN316A	NCN320A	NCN325A	NCN332A	NCN340A	-	NCN350A	NCN363A
NDN116A	NDN120A	NDN125A	NDN132A	NDN140A	-	NDN150A	NDN163A
NDN316A	NDN320A	NDN325A	NDN332A	NDN340A	-	NDN350A	NDN363A
ADB416U	ADB420U	ADB425U	ADB432U	ADB440U	ADB445U	ADB450U	-
ADC416U	ADC420U	ADC425U	ADC432U	ADC440U	ADC445U	ADC450U	-

Type B TP&N Distribution Boards

Invicta 3 250A TP&N Boards, Tri-Metered Board, Hybrid Boards



JK208BG

¹ Full metal cover & door where required for domestic dwelling applications.

Invicta 3 250A TP&N Distribution Boards (250A Incoming, 63A Outgoing)

Characteristics:

- Surface mounted steel enclosures, IP3XD rated, available with plain, glazed & Amendment 3 door options.
- Conforms to BS EN 61439-3. $I_{nA} = 250A$, $I_{nC} = 63A$, $I_{cC} = 25kA$.
- Supplied without incoming and outgoing devices. A Hager incoming kit must be used.
- For dimensions see page 69.

Description	Cat ref. Plain door	Cat ref. Glazed door	Cat ref. Residential Applications
8 Triple Pole Ways 250A TP&N Board	JK208B	JK208BG	JK208BA3 ¹
12 Triple Pole Ways 250A TP&N Board	JK212B	JK212BG	JK212BA3 ¹
16 Triple Pole Ways 250A TP&N Board	JK216B	JK216BG	JK216BA3 ¹
18 Triple Pole Ways 250A TP&N Board	JK218B	JK218BG	JK218BA3 ¹
24 Triple Pole Ways 250A TP&N Board	JK224B	JK224BG	JK224BA3 ¹



JKD2884TM

200A Tri Metered Boards (Power, Lighting & Mechanical Services)

Characteristics:

- Provides separate energy information for each group of outgoing devices. Meter also provides total board power parameters.
 - Boards are supplied with a MID approved meter that communicates via a modbus output.
 - Provided with a 200A switch disconnector incomer pre-fitted with ample cable space.
 - Conforms to BS EN 61439-3. $I_{nA} = 200A$, $I_{nC} = 63A$, $I_{cC} = 25kA$.
- Dimensions Page 72

Description	Max cable cap. solid	Lower pan ways	Middle pan ways	Upper pan ways	Cat ref.
8+8+4 Way Power, Lighting & Service Board	M8 Lug	8	8	4	JKD2884TM



JK20210BG

Hybrid 250A TP&N Distribution Boards (250A Incoming, up to 125A outgoing)

Characteristics:

- A hybrid distribution board combining 2x TP ways of 27mm MCB devices to supply end loads up to 125A, with standard 18mm MCB/RCBOs for other smaller loads.
- Surface mounted steel enclosure, IP3XD rated, available with plain steel or glazed door options.
- Conforms to BS EN 61439-3. $I_{nA} = 250A$, $I_{nC} = 63A / 125A$, $I_{cC} = 25kA$
- For dimensions see page 70.

Description	Cat ref. Plain Door	Cat ref. Glazed Door
Hybrid 250A Distribution Boards - Supplied with 250A 3P Switch Disconnector Incomer Pre-Fitted		
250A 2+10 Way Hybrid TPN Board	JK20210BSD	JK20210BGSD
250A 2+16 Way Hybrid TPN Board	JK20216BSD	JK20216BGSD
250A 2+20 Way Hybrid TPN Board	JK20220BSD	JK20220BGSD
Hybrid 250A TPN Distribution Boards Without Incomer Supplied		
250A 2+10 Way Hybrid TPN Board	JK20210B	JK20210BG
250A 2+16 Way Hybrid TPN Board	JK20216B	JK20216BG
250A 2+20 Way Hybrid TPN Board	JK20220B	JK20220BG

MCBs & RCBOs for Invicta 3 Type B TP&N Distribution Boards - See pages 44-46 for more info

		0.5A	1A	2A	3A	4A	6A	10A
MCB B Curve	Single Pole	-	-	-	-	-	NBN106A	NBN110A
	Triple Pole	-	-	-	-	-	NBN306A	NBN310A
MCB C Curve	Single Pole	NCN100A	NCN101A	NCN102A	NCN103A	NCN104A	NCN106A	NCN110A
	Triple Pole	NCN300A	NCN301A	NCN302A	NCN303A	NCN304A	NCN306A	NCN310A
MCB D Curve	Single Pole	NDN100A	NDN101A	NDN102A	NDN103A	NDN104A	NDN106A	NDN110A
	Triple Pole	NDN300A	NDN301A	NDN302A	NDN303A	NDN304A	NDN306A	NDN310A
RCBO B Curve	Single Pole	-	-	-	-	-	ADA106U	ADA110U
RCBO C Curve	Single Pole	-	-	-	-	-	ADA156U	ADA160U

MCBs Suitable for Hybrid Distribution Boards Only - See page 50 for more info

		80A	100A	125A
MCB C Curve	Single Pole	HMC180T	HMC190T	HMC199T
	Triple Pole	HMC380T	HMC390T	HMC399T
MCB D Curve	Single Pole	HMD180T	HMD190T	HMD199T
	Triple Pole	HMD380T	HMD390T	HMD399T

Incomer Kits for 250A Boards

Description	Connection	Cat ref.
3 Pole 250A MCCB Incomer Kit (Fits within distribution board)	M8 Lug	JK22503M
4 Pole 250A MCCB Incomer Kit (Fits within distribution board)	M8 Lug	JK22504M
3 Pole 250A Switch Disconnecter Incomer Kit (Fits within distribution board)	M8 Lug	JK22503S
4 Pole 250A Switch Disconnecter Incomer Kit (Fits within distribution board)	M8 Lug	JK22504MCS
4 Pole 250A Direct Connection Kit (Fits within distribution board) (Where required, use the JKD2250MID meter)	M8 Lug	JK22504D
4 Pole 160A Contactor Incomer Kit includes Switch Disconnecter (fits below distribution board, 450mm high)	M8 Lug	JK21604C
3 Pole 125A MCCB Incomer Kit (Fits within distribution board)	M8 Lug	JK21253M
4 Pole 125A MCCB Incomer Kit (Fits within distribution board)	M8 Lug	JK21254M

Surge Protection Kits for 250A Boards (including 200A Tri-Metered board)

Characteristics:

- SPD kit for direct integration within 250A TPN boards
- Type 1 + 2 SPD - Low Up value assured through use of solid copper Earth link
- Fail safe design SPD facilitates direct connection to main busbars
- SPD suitable for TN / TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earthing systems

Description	Cat ref.
Type 1 & 2 Surge Protection Kit for 250A TP&N Boards	JK201SPD
Type 2 Surge Protection Kit for 250A TP&N Boards	JK202SPD



JK201SPD

Side by Side Incomer Kits for 250A TP&N Boards

Characteristics:

- Complete with 3P SD incomer
- Cable set to connect to distribution boards
- Suitable for all 250A board sizes

Description	Connection	Cat ref.
Dual kWh Meter Module 250A Incomer Pulsed	M8 Lug	JKD250MID
Triple kWh Meter Module 250A Incomer Pulsed & Modbus Dimensions Page 76	M8 Lug	JKD250TMID

Description	Connection	Cat ref.
Type 1 SPD kit for side by side 250A TPN boards	M8 Lug	JKD201SPD
Type 2 SPD kit for side by side 250A TPN boards	M8 Lug	JKD202SPD



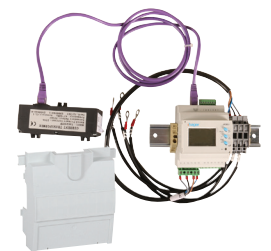
JKD250MID (distribution boards are not included)

Single Meter Packs for 250A Boards

Characteristics:

- Meter kit for standard 250A distribution boards & hybrid 250A distribution boards.
- Each meter pack contains: meter, 3 pole CT Block, 3 x fuses & carriers on DIN rail, wiring loom, incoming shroud & instructions.

Description	Cat ref.
MID Multifunction Meter Kit 250A Pulsed & Modbus	JK240MID
MID Meter Pack 250A in extension box enclosure. Required for JK20220* Distribution boards only 300mm high	JKD2250MID



JK240MID

16A	20A	25A	32A	40A	45A	50A	63A
NBN116A	NBN120A	NBN125A	NBN132A	NBN140A	-	NBN150A	NBN163A
NBN316A	NBN320A	NBN325A	NBN332A	NBN340A	-	NBN350A	NBN363A
NCN116A	NCN120A	NCN125A	NCN132A	NCN140A	-	NCN150A	NCN163A
NCN316A	NCN320A	NCN325A	NCN332A	NCN340A	-	NCN350A	NCN363A
NDN116A	NDN120A	NDN125A	NDN132A	NDN140A	-	NDN150A	NDN163A
NDN316A	NDN320A	NDN325A	NDN332A	NDN340A	-	NDN350A	NDN363A
ADA116U	ADA120U	ADA125U	ADA132U	ADA140U	ADA145U	-	-
ADA166U	ADA170U	ADA175U	ADA182U	ADA190U	-	-	-

Type B TP&N Distribution Boards

125A & 250A DIN Extension Boxes, Cable Spreader Boxes



JK116EG

DIN Extension Boxes & Door Kits for 125A Primary Boards

Characteristics:

- Extension boxes have plain or glazed doors and a DIN rail for mounting modular devices.
- Conforms to BS EN 62208.
- Full width enclosure provided with sixteen modular ways per row.
- For dimensions see page 70.

Description	Cat ref. Plain door	Cat ref. Glazed door	Cat ref. Residential Applications
125A 16 Way 1 Row DIN Extension Box	JK116E	JK116EG	JK116EA3
125A 32 Way 2 Row DIN Extension Box	JK132E	JK132EG	JK132EA3
125A 16 Mod DIN Plain Spare Door Kit (Amendment 3)	-	-	JK116EA3-DK
125A 32 Mod DIN Plain Spare Door Kit (Amendment 3)	-	-	JK132EA3-DK



JK216E

DIN Extension Boxes & Door Kits for 250A Primary Boards

Description	Cat ref. Plain door	Cat ref. Glazed door
250A 16 Way 1 Row DIN Extension Box	JK216E	JK216EG
250A 32 Way 2 Row DIN Extension Box	JK232E	JK232EG
250A 16 Way 1 Row DIN Extension Box (Amendment 3)	JK216EA3	-
250A 32 Way 2 Row DIN Extension Box (Amendment 3)	JK232EA3	-
250A 16 Mod DIN Plain Spare Door Kit (Amendment 3)	JK216EA3-DK	-
250A 32 Mod DIN Plain Spare Door Kit (Amendment 3)	JK232EA3-DK	-



JK101SE



JK101DK

Cable Spreader Boxes & Door Kits for 125A & 250A Primary Boards

Characteristics:

- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.
- Conforms to BS EN 62208.

Description	Cat ref. 125A	Cat ref. 250A
Small Cable Spreader Box (supplied without a door)	JK101SE	JK201SE
Large Cable Spreader Box (supplied without a door)	JK102LE	JK202LE
Small Cable Spreader Box Door Kit	JK101DK	JK101DK
Large Cable Spreader Box Door Kit	JK102DK	JK102DK



JK08FK

(TP&N Board not included)

Invicta 3 125A Flush Kits

Characteristics:

- Suitable for flush mounting our 8 - 24 way Invicta 3 TP&N Boards - 125A.
- Distribution board not included.
- Flush mounted distribution board solution has been revalidated to meet BS EN 61439-3 - additional requirements for flush mounted solutions
- Provides low profile high aesthetic solution for open areas.

Description	Cat ref.
Flush Mounting Kit for Invicta 3 TP&N - 8 Way	JK108FK
Flush Mounting Kit for Invicta 3 TP&N - 12 Way	JK112FK
Flush Mounting Kit for Invicta 3 TP&N - 16 Way	JK116FK
Flush Mounting Kit for Invicta 3 TP&N - 18 Way	JK118FK
Flush Mounting Kit for Invicta 3 TP&N - 24 Way	JK124FK



JN201BE

DIN Rail Extension Boxes

Characteristics

- Supplied with DIN Rail & without gland plate (utilise removed gland plate from panelboard)
- DIN rail extensions boxes have plain or glazed doors and DIN rail chassis.
- JK2 side extension boxes can be used with this range see page 25.
- For dimensions see page 71.

Description	Cat ref. Plain Door	Cat ref. Glazed Door
1 Row 26 Mod (300mm Height)	JN201BE	JN201BEG
2 Row 52 Mod (450mm Height)	JN203BE	JN203BEG

Side DIN Enclosures for Primary Boards

Characteristics:

- Side extension boxes allow for the installation of DIN rail mounted devices.
- Conforms to BS EN 62208.
- Can be horizontally or vertically attached to distribution boards.
- All DIN Enclosures supplied with two removable gland plates.
- For dimensions see page 69.

Description	Number of rows	Cat ref. Glazed door	Cat ref. Residential Applications
Side DIN Enclosures for 125A Primary Boards			
4 Way 32 Mod Side DIN Enclosure for JK104B(G)	2	JK104BDFG	JK104BDFA3
6 Way 32 Mod Side DIN Enclosure for JK106B(G)	2	JK106BDFG	JK106BDFA3
8 Way 48 Mod Side DIN Enclosure for JK108B(G)	3	JK108BDFG	JK108BDFA3
12 Way 64 Mod Side DIN Enclosure for JK112B(G)	4	JK112BDFG	JK112BDFA3
16 Way 80 Mod Side DIN Enclosure for JK116B(G)	5	JK116BDFG	JK116BDFA3
Side DIN Enclosures for 250A Primary Boards			
8 Way 80 Mod Side DIN Enclosure for JK208B(G)	5	JK208BDFG	JK208BDFA3
12 Way 80 Mod Side DIN Enclosure for JK212B(G)	5	JK212BDFG	JK212BDFA3
16 Way 96 Mod Side DIN Enclosure for JK216B(G)	6	JK216BDFG	JK216BDFA3
18 Way 112 Mod Side DIN Enclosure for JK218B(G)	7	JK218BDFG	JK218BDFA3
24 Way 128 Mod Side DIN Enclosure for JK224B(G)	8	JK224BDFG	JK224BDFA3



JK104BDFG



JK208BDFG

Side Extension Boxes for 125A Primary Boards

Characteristics:

- Side extension boxes allow cable ways to be fitted on site.
- Conforms to BS EN 62208.
- Available in either half or full distribution board width.
- All side extension boxes supplied with two removable gland plates.
- For dimensions see page 70.

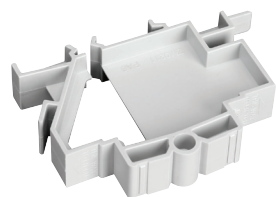
Description	Cat ref. Plain door
Side Extension Boxes for 125A Primary Boards	
4 Way Side Extension Box for JK104B(G) Full Width	JK104BSF
6 Way Side Extension Box for JK106B(G) Full Width	JK106BSF
8 Way Side Extension Box for JK108B(G) Full Width	JK108BSF
12 Way Side Extension Box for JK112B(G) Full Width	JK112BSF
16 Way Side Extension Box for JK116B(G) Full Width	JK116BSF
Side Extension Boxes for 250A Primary Boards	
8 Way Side Extension Box for JK208B(G) Full Width	JK208BSF
12 Way Side Extension Box for JK212B(G) Full Width	JK212BSF
16 Way Side Extension Box for JK216B(G) Full Width	JK216BSF
18 Way Side Extension Box for JK218B(G) Full Width	JK218BSF
24 Way Side Extension Box for JK224B(G) Full Width	JK224BSF
Half Width Side Extension Boxes for 125A Primary Boards	
4 Way Half Width Extension Box	JK104BSH
6 Way Half Width Extension Box	JK106BSH
8 Way Half Width Extension Box	JK108BSH
12 Way Half Width Extension Box	JK112BSH
16 Way Half Width Extension Box	JK116BSH
Small Half Width Filler Box	JK101BSH
Half Width Side Extension Boxes for 250A Primary Boards	
8 Way Half Width Extension Box	JK208BSH
12 Way Half Width Extension Box	JK212BSH
16 Way Half Width Extension Box	JK216BSH
18 Way Half Width Extension Box	JK218BSH
24 Way Half Width Extension Box	JK224BSH
Small Half Width Filler Box	JK201BSH



JK104BSF



JK104BSH



JK01B



JK222PK

Invicta 3 125A & 250A & IP65 Distribution Board Accessories

Description	125A Accessories Cat ref.	250A Accessories Cat ref.
Door Locking Kit	JK222PK	JK222PK
Spare Label Pack - All Sizes (one pack)	JKLABELPACK	JKLABELPACK
Single Phasing Kit	JK1SPKIT	JK250BSP
Single Pole Busbar Blank	JK01B	JK01B
Single Pole 27mm Blank		JK02B
JK1/2 Horizontal or Vertical Mechanical Connection Kit	JK100HK	JK100HK
Brass Gland Plate - 2.0mm	JK1PLATEB	JK2PLATEB
100A Top Tap Off Kit	JK100TAP	JK100TAP
Additional Earth Bar Kit High Integrity - 2 x 15 Connections	JK030BEB	JK030BEB
Document Clip	JK01DC	JK01DC
Neutral Connecting Block 100A	KRN190	KRN190
JK1/2 Neutral Clear Shroud	JK1/NEUTRALSHROUD	JK1/NEUTRALSHROUD
JK1/2 Busbar Stack Top Shroud	JK1/2TOPSHROUD	JK1/2TOPSHROUD
JK1/2 Main Incomer Shroud	JK1/INCOMSHROUD	JK2/INCOMSHROUD
Spare Gland Plate Including Drill Markings - 1.2mm	JK1PLATEM	JK2PLATEM



JK106BA3-DK

Invicta 3 125A & 250A Amendment 3 Compliant Door Kit

Description	125A Cat ref.	250A Cat ref.
4 Way TPN Plain Spare Door Kit Amendment 3	JK104BA3-DK	-
6 Way TPN Plain Spare Door Kit Amendment 3	JK106BA3-DK	-
8 Way TPN Plain Spare Door Kit Amendment 3	JK108BA3-DK	JK208BA3-DK
12 Way TPN Plain Spare Door Kit Amendment 3	JK112BA3-DK	JK212BA3-DK
16 Way TPN Plain Spare Door Kit Amendment 3	JK116BA3-DK	JK216BA3-DK
18 Way TPN Plain Spare Door Kit Amendment 3	JK118BA3-DK	JK218BA3-DK
24 Way TPN Plain Spare Door Kit Amendment 3	JK124BA3-DK	JK224BA3-DK



JK06TK

¹ 4" trunking not suitable for JKD Power & Lighting Boards.

Invicta 3 125A & 250A Trunking Kits & Spares

Characteristics:

- Each trunking kit contains a trunking channel, lid, lid joining brackets, connecting brackets and end caps.

Description	100mm 4" Cat ref.	150mm 6" Cat ref.
Trunking Kit for Invicta 3 TP&N	JK04TK ¹	JK06TK
Spare Trunking Channel	JK04TC ¹	JK06TC
Spare Lid	JK04TL ¹	JK06TL
Spare End Cap	JK04TE ¹	JK06TE
Spare Connecting Bracket	JK04TJ ¹	JK06TJ
Spare Trunking Lid Joining Bracket	JK04TP ¹	JK06TP

A photograph of two male technicians in a factory or workshop environment. They are both wearing dark blue long-sleeved shirts. The technician on the left has extensive tattoos on his arms and is wearing a white work glove on his right hand. They are both focused on a large, complex wiring assembly consisting of many white plastic terminal blocks and a dense network of multi-colored cables (red, blue, yellow, green, black). The background is a blurred industrial setting with overhead fluorescent lights and metal structures.

Tailored solutions.

From pre-assembled standard distribution units to bespoke composite TP&N boards and plug in distribution boards, we can provide the solution.

We will deliver to site to an agreed deadline and specification.

To find out more, call our Estimation Team on **01952 675600**.

:hager



JN204BG



JN204B

Invicta 3 Panelboards (250A Incoming 125A Outgoing)

Characteristics

- Comprises of IP3XD rated enclosure, pan assembly, twin neutral and earth bars.
- Conforms to BS EN 61439-2. $I_{NA} = 250A$, $I_{nc} = 125A$, $I_{cc} = 25kA$.
- Supplied without incoming kit, JN 250A incomer kit must be used.
- Form 3B type 2 using outgoing terminal shield (form 3A without terminal shield).
- Removable side gland plates are standard. Removable gland plates are provided top and bottom for ease of installation.
- For dimensions see page 77.

Cable Capacity Incomers & Outgoers

- Incomers: 3 and 4 pole incomers, cable capacity 150mm², max lug width 25mm, M8 bolt, direct connection kit.
- Outgoers: 1 & 3 pole MCCB 70mm² flexible, 95mm² solid.

Options

- Key lock, meter pack, DIN rail, extension box, spreader box.

Outgoing MCCBs

- Adjustable thermal options on triple pole devices.

Description	Cat ref. Plain door	Cat ref. Glazed door
4 Triple Pole Ways 250A Panelboard	JN204B	JN204BG
6 Triple Pole Ways 250A Panelboard	JN206B	JN206BG
8 Triple Pole Ways 250A Panelboard	JN208B	JN208BG
12 Triple Pole Ways 250A Panelboard	JN212B	JN212BG
16 Triple Pole Ways 250A Panelboard	JN216B	JN216BG

Incomer Kits

Description	Max cable capacity	Cat ref.
3 Pole 250A MCCB Incomer Kit (Adj. Thermal 0.63, 0.8, 1) 40kA (Magnetic 5, 7, 9, 11 x I_N)	M8 Lug	JN223BM
4 Pole 250A MCCB Incomer Kit (Adj. Thermal 0.63, 0.8, 1) 40kA (Magnetic 5, 7, 9, 11 x I_N)	M8 Lug	JN224BM
3 Pole 250A Non-Auto MCCB Incomer Kit	M8 Lug	JN223BS
4 Pole 250A Non-Auto MCCB Incomer Kit	M8 Lug	JN224BS
3 Pole 125A MCCB Incomer Kit	M8 Lug	JN213BM
4 Pole 125A MCCB Incomer Kit	M8 Lug	JN214BM
250A Direct Connection Kit	M8 Lug	JN224BD
Palm Kit for Larger Cable >50mm ² to 2 x 120mm ² with 10mm Bolt Fixing		JN250SL

250A JN Panelboard Surge Protection Device Kit

Characteristics

- SPD kit for direct integration within 250A Panelboards
- Fail safe design SPD facilitates direct connection to main busbars
- SPD suitable for TN / TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earthing systems
- Solid copper Earth link for enhanced U_D performance
- Supplied with mounting & connection set



JN201SPD
(Image shows Device only, kit includes connection links)

Description	Cat ref. Plain door
SPD kit Type 1+2 for JN Panelboards	JN201SPD
SPD kit Type 2 for JN Panelboards	JN202SPD

DIN Rail Extension Boxes

Characteristics

- Supplied with DIN Rail & without gland plate (utilise removed gland plate from panelboard)
- DIN rail extensions boxes have plain or glazed doors and DIN rail chassis.
- JK2 side extension boxes can be used with this range see page 25.
- For dimensions see page 71.



JN201BE

Description	Cat ref. Plain Door	Cat ref. Glazed Door
1 Row 26 Mod (300mm Height)	JN201BE	JN201BEG
2 Row 52 Mod (450mm Height)	JN203BE	JN203BEG

Cable Spreader Boxes & Door Kits

Characteristics

- Supplied without gland plates (utilise removed gland plate from panelboard)
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.



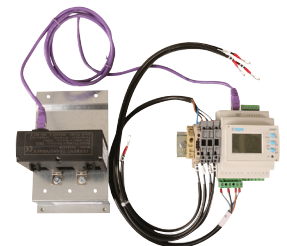
JN205BE

Description	Cat ref.
Small (300mm Height) (Door not included)	JN205BE
Large (450mm Height) (Door not included)	JN206BE
Door Kit for Small Cable Spreader Box	JN205DK
Door Kit for Large Cable Spreader Box	JN206DK

Meter Pack 250A

Characteristics

- Comprises of a digital multi function meter, three control circuit fuse carriers, wiring harness and CTs.
- The meter pack fits directly into the main panelboard.
- For metering incoming supply to the panelboard.



JN201MID

Description	Cat ref.
MID Multifunction Meter Pack 250A Pulsed & Modbus	JN201MID

Accessories

Description	Cat ref.
Allen Key Set	JF296A
Gland Plate for Invicta 3 (250A)	JN2PLATE
Key Lock with One Key	JK222PK
x125 Frame Blank (3x blanks required per triple pole way)	JN001BP
Multi Padlock Plate (for integral toggle lock, fits to toggle for up to 3 padlocks max ø8mm)	HXA039H
Neutral Barrier Kit	JN201NS



JN001BP

Outgoing Devices - See page 64 for more info

MCCBs - Single Pole

Rating.	18kA Fixed Thermal	25kA Fixed Thermal
16A	HDA014E	HHA014E
20A	HDA018E	HHA018E
25A	HDA023E	HHA023E
32A	HDA030E	HHA030E
40A	HDA038Z	HHA038Z
50A	HDA048Z	HHA048Z
63A	HDA061Z	HHA061Z
80A	HDA078Z	HHA078Z
100A	HDA098Z	HHA098Z
125A	HDA123Z	HHA123Z

MCCBs - Triple Pole Adjustable Thermal

Rating.	18kA Adjustable Thermal 0.63, 0.8, 1 x I _n	25kA Adjustable Thermal 0.63, 0.8, 1 x I _n
25A	HDA025U	HHA025U
40A	HDA040U	HHA040U
63A	HDA063U	HHA063U
80A	HDA080U	HHA080U
100A	HDA100U	HHA100U
125A	HDA125U	HHA125U

Panelboards 400A Rated

400A Incoming 125A Outgoing, DIN Extension Boxes



JF406B

Invicta 3 Panelboards (400A Incoming 125A Outgoing)

Characteristics

- Comprises of IP3XD enclosure, pan assembly, neutral bar and earth bar.
- Conforms to BS EN 61439-2. $I_{NA} = 400A$, $I_{NC} = 125A$, $I_{CC} = 50kA$.
- Supplied without incoming kit, one of the incomer kits listed below must be used.
- Form 3B type 2 using outgoing terminal shield (form 3A without terminal shield).
- Removable gland plates are provided top and bottom for ease of installation.
- For dimensions see page 78.

Cable Capacity Incomers & Outgoers

- Incomers: 3 and 4 pole incomers, cable capacity: M12 bolt, direct connection kit: M10 hexagonal bolt.
- Outgoers: 1 & 3 pole MCCB: 70mm² flexible/ 95mm² solid.

Options

- Key lock, meter pack, DIN rail, extension box, spreader box.

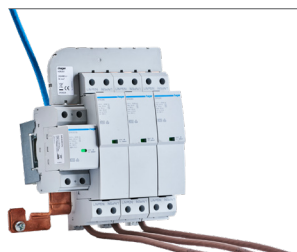
Outgoing MCCBs

- Adjustable thermal options on triple pole.

Description	Cat ref. Plain Door	Cat ref. Glazed door
6 Triple Pole Ways 400A Panelboard	JF406B	JF406BG
8 Triple Pole Ways 400A Panelboard	JF408B	JF408BG
12 Triple Pole Ways 400A Panelboard	JF412B	JF412BG
16 Triple Pole Ways 400A Panelboard	JF416B	JF416BG
18 Triple Pole Ways 400A Panelboard	JF418B	JF418BG

Incomer Kits for 400A Panelboards

Description	Max cable capacity solid	Cat ref.
3 Pole 400A MCCB Incomer Kit 50kA Electronic LSI MCCB, Ir adjustable 0.4 – 1.0 x I_N	M12 Lug	JF443BM
4 Pole 400A MCCB Incomer Kit 50kA Electronic LSI MCCB, Ir adjustable 0.4 – 1.0 x I_N	M12 Lug	JF444BM
3 Pole 400A Switch Disconnecter Incomer Kit	M12 Lug	JF443BS
4 Pole 400A Switch Disconnecter Incomer Kit	M12 Lug	JF444BS
400A Direct Connection Kit	M10 Lug	JF444BD



JF861SPD

400A JF Panelboard Surge Protection Device Kit

Characteristics

- SPD kit for direct integration within 400A Panelboards
- Type 1 + 2 SPD with Integrated fuses facilitates direct connect to main busbars
- SPD suitable for TN / TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earthing systems
- Solid copper Earth link for assured lower U_p performance

Description	Cat ref.
SPD kit Type 1 + 2 for JF Panelboards	JF861SPD



JF801E

DIN Rail Extension Boxes for 400A Panelboards

Characteristics

- DIN rail extension boxes have plain or glazed doors and DIN rail chassis.
- Cable spreader boxes are used for additional cabling space therefore do not require doors. If doors are desired optional door kits are available.
- Supplied with DIN Rail and without gland plate (utilise removed gland plate from panelboard).
- For dimensions see page 78.

Description	Cat ref. Plain Door	Cat ref. Glazed Door
1 Row 34 Mod (300mm Height)	JF801E	JF801EG
2 Row 68 Mod (450mm Height)	JF803E	JF803EG

Cable Spreader Boxes & Door Kits for 400A Panelboards

Characteristics

- Supplied without gland plates (utilise removed gland plate from panelboard).
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.



JF805E

Description	Cat ref.
Small (300mm Height) (Door not included)	JF805E
Large (450mm Height) (Door not included)	JF806E
Small Cable Spreader Box Door Kit	JF805DK
Large Cable Spreader Box Door Kit	JF806DK

Meter Pack 400A

Characteristics

- These meter packs fit directly into the main panelboard. Suitable for single incoming cable.

Description	Cat ref.
MID Multifunction Meter Pack 400A Pulsed & Modbus	JF403MID
- Requires spreader box from above, order separately	

Accessories

Description	Cat ref.
Locking Kit for Incoming Device (All Ratings)	HXD039H
Allen Key Set	JF296A
Gland Plate for Invicta 3 400A Range	JFPLATE
Key Lock with One Key	JK222PK
x125 Frame 1 Pole Blank (3x blanks required per triple pole)	JN001BP
Outgoer Locking Kit (fits to toggle for up to 3 padlocks max ø 8mm²)	HXA039H
Terminal Cover x160 1 Pole Long	HYA029H
Terminal Cover x160 3 Pole Long	HYA021H



JN001BP



HXD039H

Outgoing Devices - See page 64 for more info

MCCBs - Single Pole

Rating.	18kA Fixed Thermal	25kA Fixed Thermal
16A	HDA014E	HHA014E
20A	HDA018E	HHA018E
25A	HDA023E	HHA023E
32A	HDA030E	HHA030E
40A	HDA038Z	HHA038Z
50A	HDA048Z	HHA048Z
63A	HDA061Z	HHA061Z
80A	HDA078Z	HHA078Z
100A	HDA098Z	HHA098Z
125A	HDA123Z	HHA123Z

MCCBs - Triple Pole Adjustable Thermal

Rating.	18kA Adjustable Thermal 0.63, 0.8, 1 x I _n	25kA Adjustable Thermal 0.63, 0.8, 1 x I _n
25A	HDA025U	HHA025U
40A	HDA040U	HHA040U
63A	HDA063U	HHA063U
80A	HDA080U	HHA080U
100A	HDA100U	HHA100U
125A	HDA125U	HHA125U



JF608B

Invicta 3 Panelboards (630A/800A Incoming 125A Outgoing)

Characteristics

- Comprises of IP3XD enclosure, pan assembly, neutral bar and earth bar.
- Conforms to BS EN 61439-2. $I_{nA} = 630/800A$, $I_{nC} = 125A/250A$, $I_{CC} = 50kA$.
- Supplied without incoming kit, one of the incomer kits listed below must be used.
- Form 3B type 2 using outgoing terminal shield (form 3A without terminal shield).
- Removable gland plates are provided top and bottom for ease of installation.
- Switch Disconnect: 630A/800A, MCCB: 400A/630A, Direct connection: 800A.
- Incoming cable lugged via M12 hexagonal bolt.
- For dimensions see page 78.

Cable Capacity Incomers & Outgoers

- Incomers: 400A: 2 x 240mm², 630A/800A: 2 x 240mm² / 2 x 300mm².
- Outgoers: X160 devices: up to 125A - 70mm² flexible, 95mm² solid, X250 devices: 150mm² rigid cables, palm lug max. width: 25mm

Description	Cat ref. Plain Door	Cat ref. Glazed door
8 Triple Pole Ways 630A Panelboard	JF608B	JF608BG
12 Triple Pole Ways 630A/800A Panelboard	JF812B	JF812BG
18 Triple Pole Ways 630A/800A Panelboard	JF818B	JF818BG

¹ Max allowed incomer of 630A on this panelboard.

Invicta 3 Panelboards (630A/800A Incoming 125A/250A Outgoing)

Characteristics

- These boards will accept a range of MCCB frame sizes: 125A frame: 16-125A single pole/triple pole, 250A frame: 80-250A triple pole only
- $I_{nA} = 630/800A$, $I_{nC} = 250A$, $I_{CC} = 50kA$.

Outgoing MCCBs

- X160 adjustable thermal option.
- X250 adjustable thermal / magnetic option.

Description	Cat ref. Plain Door	Cat ref. Glazed door
6 Triple Pole Ways Panelboard (2 x 250A  + 4 x 125A )	JF60204B ¹	JF60204BG ¹
8 Triple Pole Ways Panelboard (2 x 250A  + 6 x 125A )	JF80206B	JF80206BG
8 Triple Pole Ways Panelboard (4 x 250A  + 4 x 125A )	JF80404B	JF80404BG
12 Triple Pole Ways Panelboard (2 x 250A  + 10 x 125A )	JF80210B	JF80210BG
12 Triple Pole Ways Panelboard (4 x 250A  + 8 x 125A )	JF80408B	JF80408BG
18 Triple Pole Ways Panelboard (4 x 250A  + 14 x 125A )	JF80414B	JF80414BG
18 Triple Pole Ways Panelboard (6 x 250A  + 12 x 125A )	JF80612B	JF80612BG

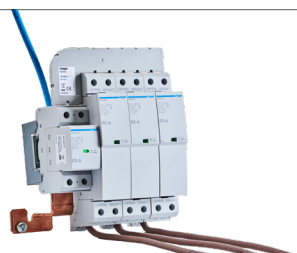
* Select the required 630A/800A rated panelboard (e.g. **JF80206BG**) and add the suffix **800LBS** e.g. **JF80206BG800LBS**

Incomer Kits for 630A/800A Panelboards

Characteristics

- A 300mm cable spreader box (**JF805E**) is required for all incomer kits.

Description	Max cable capacity	Cat ref.
4 Pole 400A Load Break Switch 25kA	M10 Lug	JF844BSW
4 Pole 630A Load Break Switch 25kA	M12 Lug	JF864BSW
4 Pole 800A Load Break Switch	M12 Lug	*800LBS
800A Direct Connection Kit 4 Pole	M12 Lug	JF884BD
3 Pole 630A MCCB Incomer Kit 50kA Electronic LSI MCCB, I_r adjustable 0.4 – 1.0 x I_n	M12 Lug	JF863BM
4 Pole 630A MCCB Incomer Kit 50kA Electronic LSI MCCB, I_r adjustable 0.4 – 1.0 x I_n	M12 Lug	JF864BM



JF861SPD

630/800A JF Panelboard Surge Protection Device Kit

Characteristics

- SPD kit for direct integration within JF Panelboards
- Type 1 + 2 SPD with Integrated fuses facilitate direct connect to main busbars
- SPD suitable for TN / TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earthing systems

Description	Cat ref.
SPD kit Type 1 + 2 for JF Panelboards	JF861SPD

DIN Rail Extension Boxes for 630A/800A Panelboards

Characteristics

- DIN rail extension boxes have plain or glazed doors and DIN rail chassis.
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.
- Supplied with DIN rail and without gland plate (utilise removed gland plate from panelboard).



JF801E

Description	Cat ref. Plain Door	Cat ref. Glazed door
1 Row 34 Mod (300mm Height)	JF801E	JF801EG
2 Row 68 Mod (450mm Height)	JF803E	JF803EG

Cable Spreader Boxes & Door Kits for 630A/800A Panelboards

Characteristics

- Supplied without gland plates (utilise removed gland plate from panelboard).
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.

Description	Cat ref.
Small (300mm Height) (Door not included)	JF805E
Large (450mm Height) (Door not included)	JF806E
Small Cable Spreader Box Door Kit	JF805DK
Large Cable Spreader Box Door Kit	JF806DK

Meter Pack for 630A/800A Panelboards

Characteristics

- These meter packs fit directly into the main panelboard.
- For Meter Enclosures see page 39.

Description	Cat ref.
MID Multifunction Meter Pack 800A Pulsed & Modbus	JF803MID
- Spreader box required to mount CT's.	

Outgoing MCCB devices - See page 64 - 66 for more info

❶ MCCB's 250A 40kA Tripple Pole - Thermal Magnetic

Rating.	Adjustable Thermal & Magnetic
100A	HNB100H
125A	HNB125H
160A	HNB160H
200A	HNB200H
250A	HNB250H

❶ & ❷ - Please see left hand page for corresponding numbers.

❷ MCCBs - 125A Single Pole - Thermal Magnetic

Rating.	18kA Fixed Thermal	25kA Fixed Thermal
16A	HDA014E	HHA014E
20A	HDA018E	HHA018E
25A	HDA023E	HHA023E
32A	HDA030E	HHA030E
40A	HDA038Z	HHA038Z
50A	HDA048Z	HHA048Z
63A	HDA061Z	HHA061Z
80A	HDA078Z	HHA078Z
100A	HDA098Z	HHA098Z
125A	HDA123Z	HHA123Z

❷ MCCB's - 125A Tripple Pole Adjustable Thermal

Rating.	18kA Adjustable Thermal 0.63, 0.8, 1 x I _n	25kA Adjustable Thermal 0.63, 0.8, 1 x I _n
25A	HDA025U	HHA025U
40A	HDA040U	HHA040U
63A	HDA063U	HHA063U
80A	HDA080U	HHA080U
100A	HDA100U	HHA100U
125A	HDA125U	HHA125U



JHF812B

Invicta 3 Panelboards (800A Incoming, 125A Outgoing)

Characteristics

- Comprises of IP3XD enclosure, pan assembly, neutral bar and earth bar
- Conforms to BS EN 61439-2. $I_{NA} = 800A$, $I_{NC} = 125A/250A$, $I_{CC} = 50kA$.
- Supplied without incoming kit, one of the incomer kits listed below must be used.
- Form 3B type 2 using outgoing terminal shield (form 3A without terminal shield).
- Removable gland plates are provided top and bottom for ease of installation.
- MCCB: 800A 3 or 4 pole.
- Incoming cable lugs 44mm pad with 2 x M12 hexagonal bolt.
- For dimensions see page 79.

Cable Capacity Incomers & Outgoers

Incomers: 800A MCCB: 2 x 300mm²,

Outgoers: Single pole up to 125A - 70mm² flexible, 95mm² solid.

Outgoing MCCBs

- Adjustable thermal options on triple pole.

Description	Cat ref. Plain Door	Cat ref. Glazed door	
12 Triple Pole Ways 800A Panelboard	JHF812B	JHF812BG	125A outgoers only
18 Triple Pole Ways 800A Panelboard	JHF818B	JHF818BG	125A outgoers only



JHF80408B

Invicta 3 Panelboards (800A Incoming 125A / 250A Outgoing)

- These boards will accept two MCCB frame sizes: 125A frame: 16 - 125A, 250A frame: 100 - 250A.
- $I_{NA} = 800A$, $I_{NC} = 250A$, $I_{CC} = 50kA$.
- Triple pole up to 250A - 150mm² flexible.

Description	Cat ref. Plain Door	Cat ref. Glazed door
8 Triple Pole Ways 800A Panelboard (2 x 250A ① + 6 x 125A ②)	JHF80206B	JHF80206BG
8 Triple Pole Ways 800A Panelboard (4 x 250A ① + 4 x 125A ②)	JHF80404B	JHF80404BG
12 Triple Pole Ways 800A Panelboard (2 x 250A ① + 10 x 125A ②)	JHF80210B	JHF80210BG
12 Triple Pole Ways 800A Panelboard (4 x 250A ① + 8 x 125A ②)	JHF80408B	JHF80408BG
18 Triple Pole Ways 800A Panelboard (4 x 250A ① + 14 x 125A ②)	JHF80414B	JHF80414BG
18 Triple Pole Ways 800A Panelboard (6 x 250A ① + 12 x 125A ②)	JHF80612B	JHF80612BG

MCCB Incomer Kits for 800A Panelboards

Description	Palm lug max (width)	Cat ref.
800A 3 Pole MCCB Incomer Auto 50kA	60mm	JHF883BM
800A 4 Pole MCCB Incomer Auto 50kA	60mm	JHF884BM



JN001BP

Accessories

Description	Cat ref.
Locking Kit for MCCB Incoming Device (All Ratings)	HXD039H
Allen Key Set	JF296A
End Plate for Invicta 3 800A Range	JFPLATE
Key Lock with One Key	JK222PK
x125 Frame 1 Pole Blank (3x blanks required per triple pole)	JN001BP
x250 Frame 3 Pole Blank (1x blank required per triple pole)	JF003BP
Outgoer Locking Kit (fits to toggle for up to 3 padlocks max ø 8mm ²)	HXA039H

800A JHF Panelboard Surge protection device kit

Characteristics:

- SPD kit for direct integration within JHF Panelboards
- Type 1 + 2 SPD with integrated fuses to facilitate direct connection to main busbars
- SPD suitable for TN/TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earth arrangements

Description	Cat ref.
SPD kit Type 1 + 2 for JHF Panelboards	JHF861SPD

DIN Rail Extension Boxes for 800A Panelboards

- DIN rail extension boxes have plain or glazed doors and DIN rail chassis.
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.
- Supplied with DIN rail and without gland plate (utilise removed gland plate from panelboard).

Description	Cat ref. Plain Door	Cat ref. Glazed door
1 Row 34 Mod (300mm Height)	JF801E	JF801EG
2 Row 68 Mod (450mm Height)	JF803E	JF803EG

Cable Spreader Boxes for 800A Panelboards

- Supplied without gland plates (utilise removed gland plate from panelboard).
- Cable spreader boxes are used for additional cabling space therefore do not require doors. Optional door kits are available.

Description	Cat ref.
Small (300mm Height) (Door not included)	JF805E
Large (450mm Height) (Door not included)	JF806E
Small Cable Spreader Box Door Kit	JF805DK
Large Cable Spreader Box Door Kit	JF806DK

Meter Pack for 800A Panelboards

- These meter packs fit directly into the main panelboard.
- For Meter Enclosures see page 39.

Description	Cat ref.
MID Multifunction Meter Pack 800A MID Pulsed & Modbus	JF803MID

- Spreader box required to mount CT's.

Outgoing Devices Thermal Magnetic - See page 64 - 66 for more info.

1 MCCBs x250 40kA - Triple Pole

Rating.	Adjustable Thermal & Magnetic
100A	HNB100H
125A	HNB125H
160A	HNB160H
200A	HNB200H
250A	HNB250H

2 MCCBs - 125A 18kA Single Pole

Rating.	18kA Fixed Thermal	25kA Fixed Thermal
16A	HDA014E	HHA014E
20A	HDA018E	HHA018E
25A	HDA023E	HHA023E
32A	HDA030E	HHA030E
40A	HDA038Z	HHA038Z
50A	HDA048Z	HHA048Z
63A	HDA061Z	HHA061Z
80A	HDA078Z	HHA078Z
100A	HDA098Z	HHA098Z
125A	HDA123Z	HHA123Z

2 MCCBs - 125A 25kA Triple Pole Adjustable Thermal

Rating.	18kA Adjustable Thermal 0.63, 0.8, 1 x I _n	25kA Adjustable Thermal 0.63, 0.8, 1 x I _n
25A	HDA025U	HHA025U
40A	HDA040U	HHA040U
63A	HDA063U	HHA063U
80A	HDA080U	HHA080U
100A	HDA100U	HHA100U
125A	HDA125U	HHA125U



JF12504SM



JF450CF



JF4508TM

Meter Enclosures for JF Panelboards

- Gland plates not included (utilise removed Gland plate from panelboard).
- When selecting outgoing metering, the panelboard metering system is easily configured by selecting a side, top or combination that matches the panelboard (e.g. for the **JF406B/G** board, you can select a **JF12504SM** side mounted meter enclosure that can house 4 **ECM01** panel mount meters). When using both side and top/bottom meter enclosures, corner filler enclosures are available.
- Meter blanky plates **JF96BP** are required for each unused meter way.
- For help choosing your metering solution see the Method Chart on page 79.
- Please contact us for any non-standard requirements or assembly.
- For dimensions see page 81.

Suitable for board type / Description	Spaces for Meters	Cat ref.
Side Meter Enclosures		
6/8 Way JF Board	4 x Din 96 Cut-Outs	JF12504SM
12 Way JF Board	6 x Din 96 Cut-Outs	JF14006SM
16 Way JF Board	8 x Din 96 Cut-Outs	JF15508SM
18 Way JF Board	9 x Din 96 Cut-Outs	JF17009SM
Blanking Plate DIN 96	-	JF96BP
Top/Bottom Meter Enclosures		
300mm Enclosure	4 x DIN 96 Cut-Outs	JF3004TM
450mm Enclosure	8 x DIN 96 Cut-Outs	JF4508TM
Meter Blanking Plate DIN 96	-	JF96BP
Corner Filler Enclosures		
300mm Corner Filler Side Enclosure	-	JF300CF
450mm Corner Filler Side Enclosure	-	JF450CF



JN11004SM



JN3003TM

Side/Top/Bottom Meter Enclosures for JN Panelboards

Characteristics

- Blanking plates not included.
- For meters see page 39.
- For dimensions see page 81.

Suitable for board type / Description	Apertures for Meters	Cat ref.
Side Meter Enclosures		
4 Way JN Board	2 x DIN 96 Cut-Outs	JN9502SM
6/8 Way JN Board	4 x DIN 96 Cut-Outs	JN11004SM
12 Way JN Board	6 x DIN 96 Cut-Outs	JN12506SM
16 Way JN Board	8 x DIN 96 Cut-Outs	JN15508SM
Top/Bottom Meter Enclosures		
300mm Enclosure	3 x DIN 96 Cut-Outs	JN3003TM
450mm Enclosure	6 x DIN 96 Cut-Outs	JN4506TM
Meter Blanking Plate	-	JF96BP
Corner Filler Enclosures		
300mm Corner Filler Side Enclosure JN	-	JN300CF
450mm Corner Filler Side Enclosure JN	-	JN450CF

Single Phase Direct Connect kWh Meters - MID Approved

Description:

- MID approved meter range (except EC...180T)
- A range of both direct connect and CT supplied din rail mounted meters

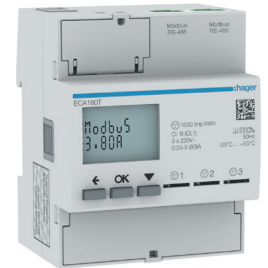
Characteristics:

- CT supplied meters compatible with 1 A / 5A CT's (not suitable for use with cables / ct's from page 38)
- Choice of communication options – pulse output kWh, Modbus or Mbus

Description	Width (1 Mod =17.5mm)	Cat ref.
40A kWh Meters		
1Ph kWh Meter Direct 40A Pulsed Output 1M	1 Mod	ECN140D
1Ph kWh Meter Direct 40A 1M Pulsed Output MID	1 Mod	ECP140D
1Ph kWh Meter Direct 40A 1M MBUS MID	1 Mod	ECM140D
1Ph kWh Meter Direct 40A 1M MODBUS MID	1 Mod	ECR140D
3 x 80A kWh Meters - Not MID Approved		
1Ph kWh Meter Direct 3x80A 4M Pulsed Output	4 Mod	ECP180T
1Ph kWh Meter Direct 3x80A 4M MBUS	4 Mod	ECM180T
1Ph kWh Meter Direct 3x80A 4M MODBUS	4 Mod	ECR180T
80A kWh Meters		
1Ph kWh Meter Direct 80A 2M Pulsed Output MID	2 Mod	ECP180D
1Ph kWh Meter Direct 80A 2M MBUS MID	2 Mod	ECM180D
1Ph kWh Meter Direct 80A 2M MODBUS MID	2 Mod	ECR180D



ECN140D



ECA180T

Three Phase Direct Connect kWh Meters - MID Approved

Description	Width (1 Mod =17.5mm)	Cat ref.
80A kWh Meters		
3Ph kWh Meter Direct 80A 4M MID	4 Mod	ECP380D
3Ph kWh Meter Direct 80A 4M MBUS MID	4 Mod	ECM380D
3Ph kWh Meter Direct 80A 4M MODBUS MID	4 Mod	ECR380D
125A kWh Meters		
3Ph kWh Meter Direct 125A 6M S0 MID	6 Mod	ECP310D
3Ph kWh Meter Direct 125A 6M MBUS MID	6 Mod	ECM310D
3Ph kWh Meter Direct 125A 6M MODBUS MID	6 Mod	ECR310D



ECM310D

Three Phase CT Fed kWh Meters

Description	Width (1 Mod =17.5mm)	Cat ref.
1-5A kWh Meters		
3Ph kWh Meter via CT 1-5A 4M Pulsed Output MID	4 Mod	ECP300C
3Ph kWh Meter via CT 1-5A 4M MBUS MID	4 Mod	ECM300C
3Ph kWh Meter via CT 1-5A 4M MODBUS MID	4 Mod	ECR300C



ECM300C



HGR96EWC

Panel Mounted DIN 96 x 96 Meters

- Panel mounted meters suitable for use with Hager MCCB Panelboard enclosures
- DIN 96 x 96 mounting
- Cables not supplied with meters
- CT, CT cable & voltage reference cables to be selected from 38 - 39

Description	Cat ref.
Panel Mounted Multifunction Meter Pulse/Modbus	ECM01
Hager by Rayleigh MID Panel Mounted Meter Pulse/Modbus	HGR96EWC
Hager by Rayleigh MID Panel Mounted Meter Mbus	HGR96EWMB

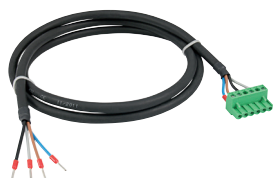


HGR41EWC

DIN Rail Mounted Meters

- Cables & CT supplied separately
- CT, CT Cable & voltage reference cables to be selected from this page.

Description	Cat ref.
DIN Rail Mounted Plug-in Meter CT Fed	JKM01
DIN Rail Mounted Plug-in Meter CT Fed - Dual Channel Input	JKM02
Hager by Rayleigh MID DIN Rail Mounted Plug-in Meter CT Fed Pulse/Modbus	HGR41EWC



PGMF300



PGMFT300

Meter Cables

Description	Cat ref. Meter to Meter Supply Cable	Cat ref. Voltage Supply Cable
Meter Supply Cable - PVC		
1m - Voltage Supply Cable with Fuse Carrier (For JF Meter Enclosures)	-	JF130VMF
1m - Voltage Supply Cable with Fuse Carrier (For JN Meter Enclosures)	-	JN130VMF
0.15m - Hi Flex Supply Cable	PGMFT150	-
0.30m - Hi Flex Supply Cable	PGMFT300	PGMF300
0.50m - Hi Flex Supply Cable	PGMFT500	PGMF500
1.00m - Hi Flex Supply Cable	PGMFT1000	PGMF1000
1.30m - Hi Flex Supply Cable	PGMFT1300	PGMF1300
2.00m - Hi Flex Supply Cable	PGMFT2000	PGMF2000
3.00m - Hi Flex Supply Cable	PGMFT3000	PGMF3000



PGRJ1000

RJ45 Connection Cable

Description	Cat ref.
0.30m - RJ45 Connector Cable 67 7003	PGRJ300
0.50m - RJ45 Connector Cable 67 L7005 LSZH	PGRJ500
1.00m - RJ45 Connector Cable 67 L7005 LSZH	PGRJ1000
1.50m - RJ45 Connector Cable 67 L7005 LSZH	PGRJ1500
2.00m - RJ45 Connector Cable 67 L7005 LSZH	PGRJ2000
3.00m - RJ45 Connector Cable 67 L7005 LSZH	PGRJ23000

Plug-in CTs

- No leads supplied with these CTs (RJ45 connection cable)
- For technical data see page 86.
- Suitable for use with ECM01, JKM01, JKM02 & Hager by Rayleigh meters.

Description	Cat ref. 125A	Cat ref. 250A	Cat ref. 400A
60A 3 Phase CT	EC1260CT	EC2560CT	-
100A 3 Phase CT	EC12100CT	EC25100CT	-
125A 3 Phase CT	EC12125CT	EC25125CT	-
160A 3 Phase CT	EC12160CT	EC25160CT	-
200A 3 Phase CT	-	EC25200CT	-
250A 3 Phase CT	-	EC25250CT	EC40250CT
400A 3 Phase CT	-	-	EC40400CT
630A 3 Phase CT	-	-	EC40630CT
800A 3 Phase CT	-	-	EC80800CT



EC1260CT

Converter

Description	Cat ref.
Standard CT to plug in adapter	JFA03



JFA03



JFD306U



JFG412U

Cable Capacity

20A = 16mm²
 32A = 16mm²
 63A = 25mm²
 100A = 95mm² = M8 Lug
 125A = 95mm² = M8 Lug
 160A = 95mm² = M8 Lug
 200A = 240mm² = M10 Lug
 250A = 240mm² = M10 Lug
 315A = 240mm² = M10 Lug
 400A = 240mm² = M10 Lug
 630A = 2 x 300mm² = M12 Lug
 800A = 2 x 300mm² = M12 Lug

Spare Fuse types

20A = NIT20
 32A = NIT32
 63A = TIS63
 100A = TCP100
 125A = TF125
 160A = TF160
 200A = TF200
 250A = TKF250
 315A = TKF315
 400A = TMF400
 630A = TTM630
 800A = TLM800

Fuse Combination Switches 20 - 800A

Characteristics

- Provides individual protection and control of circuits.
- Enclosures up to 800A have been designed to provide adequate cabling space without the need for additional cable spreader boxes.
- Operation of the device is through a door mounted rotary handle which is mechanically interlocked to prevent access to live conductors when the switch is in the on position. The handle is padlockable in the off position.
- All versions will accept standard BS 88 fuse links and can be converted to switch disconnectors by fitting copper links.

Utilisation category

- AC22A : 20 - 250A
- AC22B : 315A - 800A

Product features

- Conforms to: BS EN 60947-3
- Rated IP41.

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

Note: Copper links for conversion to isolating switches

- For dimensions see page 88.

- For technical information see page 89.

Description	Cat ref.	Cat ref. Cable extension boxes if required
Fuse Combination Switches Single Pole & Switched Neutral		
20A Fuse Combination Switch SP&SN	JFB202U	-
32A Fuse Combination Switch SP&SN	JFB203U	-
63A Fuse Combination Switch SP&SN	JFD206U	-
100A Fuse Combination Switch SP&SN	JFE210U	-
Fuse Combination Switches Triple Pole & Neutral		
20A Fuse Combination Switch TP&N	JFB302U	-
32A Fuse Combination Switch TP&N	JFB303U	-
63A Fuse Combination Switch TP&N	JFD306U	-
100A Fuse Combination Switch TP&N	JFE310U	-
125A Fuse Combination Switch TP&N	JFG312U	JZA701
160A Fuse Combination Switch TP&N	JFG316U	JZA701
200A Fuse Combination Switch TP&N	JFG320U	JZA701
250A Fuse Combination Switch TP&N	JFG325U	JZA701
315A Fuse Combination Switch TP&N	JFH331U	JZA702
400A Fuse Combination Switch TP&N	JFH340U	JZA702
630A Fuse Combination Switch TP&N	JFI363U	JZA703
800A Fuse Combination Switch TP&N	JFI380U	JZA703
Fuse Combination Switches Triple Pole & Switched Neutral		
20A Fuse Combination Switch TP&SN	JFB402U	-
32A Fuse Combination Switch TP&SN	JFB403U	-
63A Fuse Combination Switch TP&SN	JFD406U	-
100A Fuse Combination Switch TP&SN	JFE410U	-
125A Fuse Combination Switch TP&SN	JFG412U	JZA701
160A Fuse Combination Switch TP&SN	JFG416U	JZA701
200A Fuse Combination Switch TP&SN	JFG420U	JZA701
250A Fuse Combination Switch TP&SN	JFG425U	JZA701
315A Fuse Combination Switch TP&SN	JFH431U	JZA702
400A Fuse Combination Switch TP&SN	JFH440U	JZA702
630A Fuse Combination Switch TP&SN	JFI463U	JZA703
800A Fuse Combination Switch TP&SN	JFI480U	JZA703
Copper Links		
63A	JC60L	-
100A	JC10L	-
125 / 250A	JC20L	-
315 / 400A	JC40L	-

Switch Fuses

Characteristics

- Amendment 3 compliant switch fuses have a full metal construction to comply with BS 7671, when used in residential applications
- For dimensions see page 91.

Description	Cat ref.	Cat ref. Amd 3 door
4 Module Metal Unit 1 x 100A Isolator, AC22A. Connection Capacity: 50mm ² Rigid Conductor, 35mm ² Flexible Conductor, 1 x 63A Fuse	IU44-16	IU44-16D
4 Module Metal Unit 1 x 100A Isolator, AC22A. Connection Capacity: 50mm ² Rigid Conductor, 35mm ² Flexible Conductor, 1 x 80A Fuse	IU44-18	IU44-18D
4 Module Metal Unit 1 x 100A Isolator, AC22A. Connection Capacity: 50mm ² Rigid Conductor, 35mm ² Flexible Conductor, 1 x 100A Fuse	IU44-11	IU44-11D



IU44-11

Switch Disconnectors 20-800A

Characteristics

- Designed to provide individual isolation of circuits up to 800A.
- Provides adequate cabling space without the need for additional cable spreader boxes.
- Operation of the device is through a door mounted rotary handle which is mechanically interlocked to prevent access to live conductors when the switch is in the on position. The handle is padlockable in the off position.

Utilisation category

- AC-22A

Product features

- Conforms to: BS EN 60947-3
- IP rating: IP41.
- For technical information see page 88 - 92.

Rating	Cat ref.	Cat ref. Cable extension boxes if required
Switch Disconnectors Triple Pole & Neutral		
160A	JAC316	JZA700
200A	JAE320	JZA701
250A	JAE325	JZA701
315A	JAG331	JZA701
400A	JAG340	JZA701
630A	JAH363	JZA702
800A	JAH380	JZA702



JAE420



JAH363

Switch Disconnectors Triple Pole & Switched Neutral

20A	JAB402B	-
32A	JAB403B	-
63A	JAB406B	-
100A	JAB410B	-
125A	JAC412B	-
160A	JAC416	JZA700
200A	JAE420	JZA701
250A	JAE425	JZA701
315A	JAG431	JZA701
400A	JAG440	JZA701
630A	JAH463	JZA702
800A	JAH480	JZA702

Cable Capacity

- 20A = 16mm²
- 32A = 16mm²
- 63A = 25mm²
- 100A = 95mm² = M8 Lug
- 125A = 95mm² = M8 Lug
- 160A = 95mm² = M8 Lug
- 200A = 240mm² = M10 Lug
- 250A = 240mm² = M10 Lug
- 315A = 240mm² = M10 Lug
- 400A = 240mm² = M10 Lug
- 630A = 2 x 300mm² = M12 Lug
- 800A = 2 x 300mm² = M12 Lug



JG01S

Cable Capacity
 20 - 40A = 16mm²
 63 - 100A = 35mm²

IP65 Switch Disconnectors

- A range of enclosed switch disconnectors to IP65 for individual isolation.
- The devices are padlockable in three positions and offer plenty of cabling space. Clip on auxiliary contacts can be fitted retrospectively.

Product features

- Conforms to: BS EN 60947-3.
- IP65 to BS EN 60529.

Range: TPN 10, 16, 25, 40, 63 & 80A.

Utilisation category

- AC- 21.
- AC- 22.
- For technical information see page 91.

I _n AC 21	I _n AC 22	Cat ref.
20A	10A	JG00S
25A	16A	JG01S
40A	25A	JG02S
63A	40A	JG03S
80A	63A	JG04S
100A	80A	JG05S

Auxiliary Changeover Contacts

Description	Cat ref.
1 Normally Open / 1 Normally Closed Auxiliary Contacts 16-80A	JG10A
2 Normally Open / 2 Normally Closed Auxiliary Contacts 16-80A	JG20A



JG440DC

Cable Capacity
 20 - 40A = 16mm²
 63 - 100A = 35mm²

IP65 Switch Disconnectors - DC

- Used in applications such as photovoltaic installations where they isolate the incoming side of the inverter.
- They are supplied in grey with a black handle so that it is easy to distinguish them from the yellow/red A.C. switches used on the outgoing side of the inverter.

Product Features

- Conforms to: BS EN 60947-3 IP65 to BS EN 60529.
- An interlock ensures that the cover cannot be removed in both the ON and PADLOCKED OFF positions.

Rating	Utilisation Category	Cat ref.
12A at 500V DC-21B, 10A at 600V DC-21B 8A at 800V DC-21B, 6A at 440V DC-22B	DC-21B	JG416DC
16A at 500V DC-21B, 12A at 600V DC-21B 10A at 800V DC-21B, 6A at 440V DC-22B	DC-21B DC-22B	JG425DC
20A at 500V DC-21B, 16A at 600V DC-21B 12A at 800V DC-21B, 16A at 440V DC-22B	DC-21B DC-22B	JG440DC

Enclosed MCCBs

- The devices are mounted in IP31 enclosures, with removable cable entry plates located on the top and bottom.
- Single & triple pole devices are equipped with fully rated neutral links.

Non-Auto MCCB

- Triple pole: 125A - 250A - 400A - 630A.
- Four pole: 125A - 250A - 400A - 630A.

Specification

- Conforms to BS EN 61439-2.

Cable Capacity

- 63 - 125A: Flexible cable: min 6mm², max 70mm², Rigid cable: min 6mm², max 95mm².
- RCD add-on adjustable from 0.03A, 0.1A, 0.3A, 1A, 3A, 6A.
- Time delay - Instantaneous, 60ms, 150ms, 300ms, 500ms, 1s.
- For technical details and dimensions see page 94.

Description	I _{cu}	Cat ref.
Enclosed MCCBs Single Pole & Neutral		
63A Single Pole Enclosed MCCB	18kA	JG25BM
100A Single Pole Enclosed MCCB	18kA	JG28BM
125A Single Pole Enclosed MCCB	18kA	JG31BM
Enclosed MCCBs Triple Pole and Neutral (63-125A)		
63A 3-Pole Enclosed MCCB (40A-50A 63A)	18kA	JG26BM
100A 3-Pole Enclosed MCCB (63A-80A-100A)	18kA	JG29BM
125A 3-Pole Enclosed MCCB (80A-100-125A)	18kA	JG32BM
125A 3-Pole Enclosed Non-Auto MCCB	Non-Auto	JG34BS
Enclosed MCCBs Triple Pole and Neutral (160-250A)		
160A 3-Pole Enclosed MCCB (Adjustable)	25kA	JG36BM
250A 3-Pole Enclosed MCCB (Adjustable)	25kA	JG40BM
250A 3-Pole Enclosed Non-Auto MCCB	Non-Auto	JG42BS
Enclosed MCCBs Triple Pole and Neutral (400-630A)		
400A 3-Pole Enclosed MCCB (Adjustable)	50kA	JG44BM
400A 3-Pole Enclosed Non-Auto MCCB	Non-Auto	JG46BS
630A 3-Pole Enclosed MCCB (Adjustable)	50kA	JG48BM
630A 3-Pole Enclosed Non-Auto MCCB	Non-Auto	JG50BS
Enclosed MCCBs Four Pole (63-125A)		
63A 4-Pole Enclosed MCCB (Adjustable)	18kA	JG27BM
63A 4-Pole Enclosed MCCB (Adjustable) + RCD Add-on	18kA	JG27BR
100A 4-Pole Enclosed MCCB (Adjustable)	18kA	JG30BM
100A 4-Pole Enclosed MCCB (Adjustable) + RCD Add-on	18kA	JG30BR
125A 4-Pole Enclosed MCCB (Adjustable)	18kA	JG33BM
125A 4-Pole Enclosed Non-Auto MCCB	Non-Auto	JG35BS
Enclosed MCCBs Four Pole (160-250A)		
160A 4-Pole Enclosed MCCB (Adjustable)	25kA	JG37BM
160A 4-Pole Enclosed MCCB RCD Add-on	25kA	JG37BR
200A 4-Pole Enclosed MCCB RCD Add-on	25kA	JG38BR
250A 4-Pole Enclosed MCCB (Adjustable)	25kA	JG41BM
250A 4-Pole Enclosed Non-Auto MCCB	Non-Auto	JG43BS
Enclosed MCCBs Four Pole (400-630A)		
400A 4-Pole Enclosed MCCB (Adjustable)	50kA	JG45BM
375A 4-Pole Enclosed MCCB RCD Add-on	50kA	JG45BR
400A 4-Pole Enclosed Non-Auto MCCB	Non-Auto	JG47BS
630A 4-Pole Enclosed MCCB (Adjustable)	50kA	JG49BM
630A 4-Pole Enclosed Non-Auto MCCB	Non-Auto	JG51BS



JG38BR



JG41BM



JG45BM



NCN116A

MCBs 10kA

Characteristics

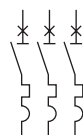
- Provides protection against short circuits, protection against overload current, control, isolation, trip free mechanism.

Isolation

- The state of isolation is clearly indicated by the "OFF" mechanical position on the toggle with the green colour.
- Connection capacity: 25mm² flexible conductor, 35mm² rigid conductor.
- Conforms to: BS EN 60898-2 (10kA), BS EN 60947-2 (15kA).

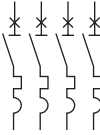


Rating	Width (1 Mod = 17.5mm)	Cat ref. "B" Curve	Cat ref. "C" Curve	Cat ref. "D" Curve
Single Pole MCBs				
0.5A	1 Mod	-	NCN100A	NDN100A
1A	1 Mod	-	NCN101A	NDN101A
2A	1 Mod	-	NCN102A	NDN102A
3A	1 Mod	-	NCN103A	NDN103A
4A	1 Mod	-	NCN104A	NDN104A
6A	1 Mod	NBN106A	NCN106A	NDN106A
10A	1 Mod	NBN110A	NCN110A	NDN110A
16A	1 Mod	NBN116A	NCN116A	NDN116A
20A	1 Mod	NBN120A	NCN120A	NDN120A
25A	1 Mod	NBN125A	NCN125A	NDN125A
32A	1 Mod	NBN132A	NCN132A	NDN132A
40A	1 Mod	NBN140A	NCN140A	NDN140A
50A	1 Mod	NBN150A	NCN150A	NDN150A
63A	1 Mod	NBN163A	NCN163A	NDN163A



Triple Pole MCBs				
0.5A	3 Mod	-	NCN300A	NDN300A
1A	3 Mod	-	NCN301A	NDN301A
2A	3 Mod	-	NCN302A	NDN302A
3A	3 Mod	-	NCN303A	NDN303A
4A	3 Mod	-	NCN304A	NDN304A
6A	3 Mod	NBN306A	NCN306A	NDN306A
10A	3 Mod	NBN310A	NCN310A	NDN310A
16A	3 Mod	NBN316A	NCN316A	NDN316A
20A	3 Mod	NBN320A	NCN320A	NDN320A
25A	3 Mod	NBN325A	NCN325A	NDN325A
32A	3 Mod	NBN332A	NCN332A	NDN332A
40A	3 Mod	NBN340A	NCN340A	NDN340A
50A	3 Mod	NBN350A	NCN350A	NDN350A
63A	3 Mod	NBN363A	NCN363A	NDN363A

MCBs 10kA (Continued)

	Rating	Width (1 = 17.5mm)	Cat ref. "B" Curve	Cat ref. "C" Curve	Cat ref. "D" Curve
	Double Pole MCBs				
	0.5A	2 Mod	-	NCN200A	NDN200A
	1A	2 Mod	-	NCN201A	NDN201A
	2A	2 Mod	-	NCN202A	NDN202A
	3A	2 Mod	-	NCN203A	-
	4A	2 Mod	-	NCN204A	NDN204A
	6A	2 Mod	NBN206A	NCN206A	NDN206A
	10A	2 Mod	NBN210A	NCN210A	NDN210A
	16A	2 Mod	NBN216A	NCN216A	NDN216A
	20A	2 Mod	NBN220A	NCN220A	NDN220A
	25A	2 Mod	NBN225A	NCN225A	NDN225A
	32A	2 Mod	NBN232A	NCN232A	NDN232A
	40A	2 Mod	NBN240A	NCN240A	NDN240A
	50A	2 Mod	NBN250A	NCN250A	NDN250A
	63A	2 Mod	NBN263A	NCN263A	NDN263A
	Four Pole MCBs				
	0.5A	4 Mod	-	NCN400A	NDN400A
	1A	4 Mod	-	NCN401A	NDN401A
	2A	4 Mod	-	NCN402A	NDN402A
	3A	4 Mod	-	NCN403A	NDN403A
	4A	4 Mod	-	NCN404A	NDN404A
	6A	4 Mod	NBN406A	NCN406A	NDN406A
	10A	4 Mod	NBN410A	NCN410A	NDN410A
	16A	4 Mod	NBN416A	NCN416A	NDN416A
	20A	4 Mod	NBN420A	NCN420A	NDN420A
	25A	4 Mod	NBN425A	NCN425A	NDN425A
	32A	4 Mod	NBN432A	NCN432A	NDN432A
	40A	4 Mod	NBN440A	NCN440A	NDN440A
	50A	4 Mod	NBN450A	NCN450A	NDN450A
	63A	4 Mod	NBN463A	NCN463A	NDN463A



NCN316A



NCN416A

Accessories

Description	Cat ref.
Padlockable Locking Kit for MCB, RCCB & RCBO	MZN175
Padlock with 2 keys 3/4"	JK25A



MZN175
(device & padlock
not included)

RCBOs - Single Pole - 10kA B & C Curve Type A

Characteristics

- Compact protection devices which combine the overcurrent functions of an MCB with the earth fault functions of an RCCB in a single unit.
- These devices are single pole & solid neutral.
- Locking kit = Cat ref.: **MZN175**.
- New D Curve RCBO options specifically suitable for final circuits with high inrush current characteristics

Technical Data

- Conforms to IEC 61009-1, IEC 61009-2-2, EN 61009-1.

Sensitivities (fixed)

- 10mA, 30mA & 100mA.
- Flying neutral lead: 700mm.
- Terminal Capacities, 25mm² rigid, 16mm² flexible.

Operating Voltage

Current rating	Width (1 Mod = 17.5mm)	B Curve Cat ref.	C Curve Cat ref.	D Curve Cat ref.
Sensitivity 30mA (10kA) B / C Curve, Type A				
6A RCBO Single Pole 30mA 10kA	1 Mod	ADB406U	ADC406U	ADD406U
10A RCBO Single Pole 30mA 10kA	1 Mod	ADB410U	ADC410U	ADD410U
16A RCBO Single Pole 30mA 10kA	1 Mod	ADB416U	ADC416U	ADD416U
20A RCBO Single Pole 30mA 10kA	1 Mod	ADB420U	ADC420U	ADD420U
25A RCBO Single Pole 30mA 10kA	1 Mod	ADB425U	ADC425U	ADD425U
32A RCBO Single Pole 30mA 10kA	1 Mod	ADB432U	ADC432U	ADD432U
40A RCBO Single Pole 30mA 10kA	1 Mod	ADB440U	ADC440U	-
45A RCBO Single Pole 30mA 10kA	1 Mod	ADB445U	ADC445U	-
50A RCBO Single module 30mA 10kA	1 Mod	ADB450U	ADC450U	-
Sensitivity 10mA (10kA) B / C Curve, Type A				
6A RCBO Single Pole 10mA 10kA	1 Mod	ACA106U	ACA156U	
16A RCBO Single Pole 10mA 10kA	1 Mod	ACA116U	ACA166U	
25A RCBO Single Pole 10mA 10kA	1 Mod	ACA125U	ACA175U	
32A RCBO Single Pole 10mA 10kA	1 Mod	ACA132U	ACA182U	
40A RCBO Single Pole 10mA 10kA	1 Mod	ACB440U	ACC440U	
45A RCBO Single Pole 10mA 10kA	1 Mod	ACB445U	ACC445U	
Sensitivity 100mA (10kA) C Curve, Type A				
6A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC406U	
10A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC410U	
16A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC416U	
20A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC420U	
25A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC425U	
32A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC432U	
45A RCBO Single Pole 100mA 10kA	1 Mod	-	AEC445U	

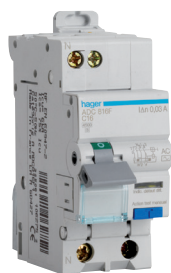
Arc Fault Detection Devices

Characteristics:

- Single Module Protection device that combines RCBO with Arc fault detection
- Conforms to BS EN 62606
- Rated short circuit breaking capacity Inc AC to BS EN 60898 - 6kA
- Current ratings 6A - 32A
- Available in B curve only
- Connection capacity - Rigid 25mm², 16mm² flexible
- Neutral cable length 1.0m
- Advanced diagnostic and firmware update on your phone, via Bluetooth through the Hager App
- Coordinated short circuit breaking capacity in conjunction with upstream Hager X160 frame size MCCB's - 10kA

Description	size	Cat ref.
6A	1 Mod	ARL906U
10A	1 Mod	ARL910U
13A	1 Mod	ARL916U
16A	1 Mod	ARL920U
20A	1 Mod	ARL925U
25A	1 Mod	ARL932U
32A	2 Mod	ARC532U (10kA)





ADC816F

RCBOs - Single Pole & Switched Neutral - 4.5kA C Curve

Characteristics

- Compact protection devices which provide MCB overcurrent protection and RCCB earth fault protection in a single unit.
- The device switches both the line and neutral conductors. All ratings have 30mA earth fault protection. The units feature indicators which show whether a trip is due to an overcurrent or earth fault.

Technical Data

- Breaking capacity: 4.5kA.
- Conforms to EN 61009-1.
- Operating Voltage: 230V A.C. -15% +10% 50Hz.
- Mechanical life: 20,000 operations.
- Connection Capacity: Rigid conductor 25mm², Flexible conductor 16mm²
- **Note:** Not for use in fixed busbar consumer units or distribution boards.

Current rating	Width (1 Mod = 17.5mm)	C Curve Cat ref.
6A RCBO SPSN 4.5kA	2 Mod	ADC806F
10A RCBO SPSN 4.5kA	2 Mod	ADC810F
16A RCBO SPSN 4.5kA	2 Mod	ADC816F
20A RCBO SPSN 4.5kA	2 Mod	ADC820F
25A RCBO SPSN 4.5kA	2 Mod	ADC825F
32A RCBO SPSN 4.5kA	2 Mod	ADC832F



ADA990U

RCBOs - Single Pole & Switched Neutral - 6kA B & C Curve Type A

Characteristics

- Compact protection devices which provide MCB overcurrent protection and RCCB earth fault protection in a single unit.
- The device switches both the line and neutral conductors. All ratings have 30mA earth fault protection. The units feature indicators which show whether tripping is due to an overcurrent or earth fault.

Technical Data

- Breaking capacity: 6kA.
- Conforms to EN 61009-1.
- Operating Voltage: 230V A.C. +10%/-15% 50Hz.
- Mechanical life: 20,000 operations.
- Connection Capacity: Rigid conductor 25mm², Flexible conductor 16mm²
- Neutral connection flying lead - 700mm.

Current rating	Width (1 Mod = 17.5mm)	B Curve Cat ref.	C Curve Cat ref.
6A RCBO SPSN 6kA	2 Mod	ADA906U	ADA956U
10A RCBO SPSN 6kA	2 Mod	ADA910U	ADA960U
16A RCBO SPSN 6kA	2 Mod	ADA916U	ADA966U
20A RCBO SPSN 6kA	2 Mod	ADA920U	ADA970U
25A RCBO SPSN 6kA	2 Mod	ADA925U	ADA975U
32A RCBO SPSN 6kA	2 Mod	ADA932U	ADA982U
40A RCBO SPSN 6kA	2 Mod	ADA940U	ADA990U



BD163T

Triple Pole RCD Add-On Blocks for MCB Devices

Characteristics

- Compatible with **NBN, NCN & NDN** range of MCB devices.
- Can be used in combination with any Hager 3 pole 10kA MCB up to 63A. Requires the use of the adjacent outgoing way.
- Type A RCD provides added protection against 'pulsating D.C. current'
- 3 Phase earth leakage protection up to 63A.
- One module add-on block + MCB combinations suit all Hager distribution boards.
- BS EN 61009-1 Appendix G.

Sensitivity I _{Δn}	I _n A	Width (35mm)	Cat ref.
30mA	63A	4 Mod	BD163T
100mA	63A	4 Mod	BE163T
300mA	63A	4 Mod	BF163T

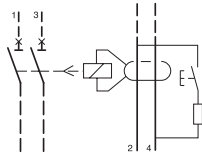
RCCB Add-On Blocks for MCB Devices

Characteristics

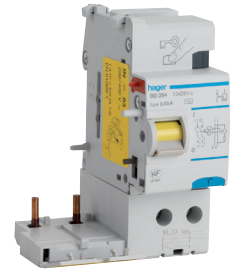
- Provide earth fault protection when associated with the 10kA (types **NBN**, **NCN**, **NDN**) range of MCBs.
- Designed to be fitted to the right hand side of 2 and 4 pole MCBs and the completed unit provides protection against overload, short circuit & earth faults.
- Protection against nuisance tripping.
- All devices have a test facility.
- Note: Not for use in fixed busbar distribution boards.

Technical Data

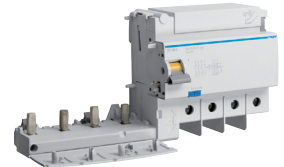
- Nominal voltage 230 - 400V.
- Selective (time delay) versions are available in 100mA & 300mA.
- Connection Capacity: 16mm² Flexible, 25mm² Rigid.
- Conforms to BS EN 61009 Appendix G



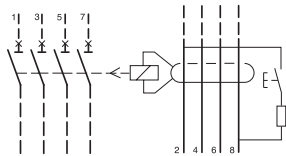
Sensitivity $I_{\Delta n}$	I_n A	Width (1 Mod = 17.5mm)	Cat ref.
Double Pole RCCB Add-On Blocks			
30mA	63A	2 Mod	BD264
100mA	63A	2 Mod	BE264
300mA	63A	2 Mod	BF264
Time Delayed  100mA	63A	2 Mod	BN264
Time Delayed  300mA	63A	2 Mod	BP264



BD264



BD464



Four Pole RCCB Add-On Blocks			
30mA	63A	3 Mod	BD464
100mA	63A	3 Mod	BE464
300mA	63A	3 Mod	BF464
Time Delayed  100mA	63A	3 Mod	BN464
Time Delayed  300mA	63A	3 Mod	BP464

One Module Add-On Blocks for MCB Devices

Characteristics

- Compatible with **NBN**, **NCN** & **NDN** range of MCB devices.
- Can be used in combination with any Hager 3 pole 10kA MCB up to 63A. Requires the use of the adjacent outgoing way.
- Type A RCD provides added protection against 'pulsating D.C. current'
- 3 Phase earth leakage protection up to 63A.
- One module add-on block + MCB combinations suit all Hager distribution boards.
- BS EN 61009-1 Appendix G.
- For technical details see page 105.

Sensitivity $I_{\Delta n}$	I_n A	Width (1 Mod = 17.5mm)	Cat ref.
30mA	63A	4 Mod	BD163T
100mA	63A	4 Mod	BE163T
300mA	63A	4 Mod	BF163T



BD163T

1 1/2 Mod MCBs

80 - 125A 10kA C Curve, 15kA C & D Curve



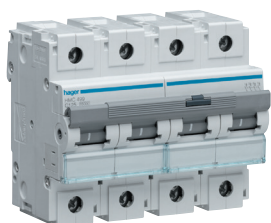
HMF199T



HMF299T



HMF399T



HMF499T

MCBs 80 - 125A

- Suitable for isolation (according to BS EN 60947-2). The isolation of the circuit breakers is indicated by a green indicator on the toggle.

Standards

- 10 kA: BS EN 60898-1, 10 kA BS EN 60947-2
- 15 kA: BS EN 60898-1, 15 kA BS EN 60947-2
- I_n 80 to 125A

Connection Capacity

- 35mm² flexible (50mm² possible with some cable pin lugs).
- 70mm² rigid.

Nominal Voltage

- 230/415 V A.C.
- Calibration setting: 30 °C
- (BS EN 60898-1)
- Insulation voltage: 500 V

Lockable Toggle

- MCB can be locked in "Off" position by the integrated locking facility on the toggle.
- This lock allows the insertion of a 2.5-3.5mm plastic cable tie where you can fit a warning card if necessary, allowing a safer working environment.
- Compatible with RCD Add-On Blocks.

Rating	Width (1 = 17.5mm)	Cat ref. 10kA C Curve	Cat ref. 15kA C Curve	Cat ref. 15kA D Curve
Single Pole MCBs				
80A	1 1/2 Mod	HMF180T	HMC180T	HMD180T
100A	1 1/2 Mod	HMF190T	HMC190T	HMD190T
125A	1 1/2 Mod	HMF199T	HMC199T	HMD199T

Double Pole MCBs

80A	3 Mod	HMF280T	HMC280T	HMD280T
100A	3 Mod	HMF290T	HMC290T	HMD290T
125A	3 Mod	HMF299T	HMC299T	HMD299T

Triple Pole MCBs

80A	4 1/2 Mod	HMF380T	HMC380T	HMD380T
100A	4 1/2 Mod	HMF390T	HMC390T	HMD390T
125A	4 1/2 Mod	HMF399T	HMC399T	HMD399T

Four Pole MCBs

80A	6 Mod	HMF480T	HMC480T	HMD480T
100A	6 Mod	HMF490T	HMC490T	HMD490T
125A	6 Mod	HMF499T	HMC499T	HMD499T



MZN130

Terminal Covers Screw Cap

Description

To cover connection terminals and screws of circuit breaker.
The screw covers can be sealed.

Cat ref.

MZN130



MZN131

Phase Barrier

Description

1 Set of 3 Phase Separators

Cat ref.

MZN131

Single Pole & Switched Neutral MCB - 6kA C Curve

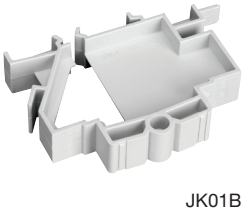
- Description**
- For protection and control of circuits against overloads and short circuits.
- Technical Data**
- Conforms to BS EN 60898
- Voltage rating - 230V A.C.
- Connection Capacity**
- Rigid 16mm²
- Flexible 10mm²
- Locking kit = Cat ref.: **MZN175**

Rating	Width (1 = 17.5mm)	Cat ref.
6A SPSN MCB 6kA	1 Mod	MLN706A
10A SPSN MCB 6kA	1 Mod	MLN710A
16A SPSN MCB 6kA	1 Mod	MLN716A
20A SPSN MCB 6kA	1 Mod	MLN720A
32A SPSN MCB 6kA	1 Mod	MLN732A
40A SPSN MCB 6kA	1 Mod	MLN740A



Single Module Blank

Description	Cat ref.
Shrouds busbar and blanks spare ways	JK01B





CDC225U



CFC425U

2 & 4 Pole RCCBs

Characteristics

- To open a circuit automatically in the event an earth fault between line and earth, and/or neutral and earth.

Technical Data

- Conforms to BS EN 61008, IEC1008
- Terminal capacities: 16-63A Rigid 25mm², Flexible 16mm² / 80 & 100A Rigid 50mm², Flexible 35mm²

Features

- Positive contact indication is provided by the rectangular flag indicator
- Red = Closed
- Green = Open
- Indication of trip is provided by the flag indicator
- Yellow = Tripped
- All RCCBs have trip free mechanisms and can be padlocked either on or off with the use of a **MZN175**.

Operating Voltage

- 2P 127- 230V A.C.
- 4P 230 - 400V A.C.

Sensitivity type A	2 Pole Type F Cat ref.	4 Pole Type F Cat ref.	2 Pole Type B Cat ref.	4 Pole Type B Cat ref.	2 Pole Type A Cat ref.	4 Pole Type A Cat ref.
RCCBs Sensitivity 30mA						
RCCB 25A 30mA	CDF525U ★	CDF625U ★	CDB525E ★	-	CDA225U	CDA425U
RCCB 40A 30mA	CDF540U ★	CDF640U ★	CDB540E ★	CDB640E ★	CDA240U	CDA440U
RCCB 63A 30mA	CDF563U ★	CDF663U ★	-	CDB663E ★	CDA263U	CDA463U
RCCB 80A 30mA	-	-	-	-	CDA580U ★	CDA680U ★
RCCB 100A 30mA	-	-	-	-	CDA584U ★	CDA684U ★
RCCB 125A 30mA	-	-	-	-	-	CDA690 ★
RCCBs Sensitivity 100mA						
RCCB 25A 100mA	-	-	-	-	CEA225U	-
RCCB 40A 100mA	-	-	-	-	CEA240U	CE440J
RCCB 63A 100mA	-	-	-	-	CEA263U	CE463J
RCCB 80A 100mA	-	-	-	-	CEA580U ★	CEA680U ★
RCCB 100A 100mA	-	-	-	-	CEA584U ★	CEA684U ★
RCCBs Sensitivity 300mA						
RCCB 25A 300mA	-	-	-	-	CFA225U	CF425J
RCCB 40A 300mA	-	-	-	-	CFA240U	CF440J
RCCB 63A 300mA	-	-	-	-	CFA263U	CF463J
RCCB 80A 300mA	-	-	-	-	-	CFA680U ★
RCCB 100A 300mA	-	-	-	-	CFA584U ★	CFA684U ★
RCCB 125A 300mA	-	-	-	-	-	CFA690 ★
RCCBs Time Delayed						
RCCB 100A 100mA	-	-	-	-	CNA584U ★	CNA684U ★
RCCB 100A 300mA	-	-	-	-	CPA584U ★	CPA684U ★



CZN006

Terminal Covers

Current Rating	2 Pole Cat ref.	4 Pole Cat ref.
16 - 63A	CZN005	CZN006
80 - 100A	CZ007	CZ008

RCCB Auxiliaries

Auxiliary Interface

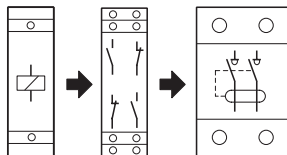
- Indicates the position of the associated RCCB on, off or tripped. Also acts as RCCB interface with standard MCB auxiliaries **MZ203-MZ206**.

Shunt Trip

- Allows remote tripping of the associated device, operation of the coil is indicated by a flag on the front of the device.

Under Voltage Release

- Allows RCCB to be closed, only when voltage is above 85% of U_n . RCCB will automatically trip when voltage falls to between 70-35% of U_n (230V). Operation of the release is indicated by a flag on the front of the device.



MZ203 **CZ001** **RCCB**
to **MZ206**



CZ001



MZ203

Description	Width (1 Mod = 17.5mm)	Cat. ref.
Auxiliary Interface 2 Normally Open / 2 Normally Closed 6A A.C.1 230V	1 Mod	CZ001

Auxiliaries for MCBs & RCCBs

Characteristics

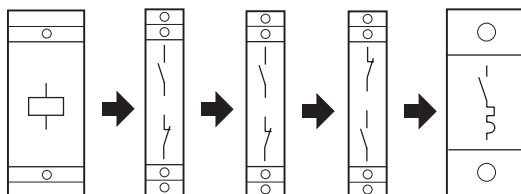
- All auxiliaries are common to both single and multi-pole 10kA circuit breakers and RCCBs.

Connection capacity

- 4mm² flexible, 6mm² rigid

Shunt Trip: Allows remote tripping of devices. Operation of the coil is indicated by a flag on the front of the device.

Under Voltage Release: Allows MCB to be closed only when voltage is above 85% of U_n . MCB will automatically trip when voltage falls to between 70-35% of U_n . Operation of the coil is indicated by a flag on the front of the device.



MZ203 to + **MZ201** + **MZ201** + **MZ202** + **MCB**
MZ206 **MZ201** **MZ201** **MZ201**



MZ201

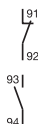


MZ202



MZ204

Description	Width (1 Mod = 17.5mm)	Cat. ref.
Auxiliary Contacts 5A - 230V A.C. 1NO + 1NC Allows remote indication of main contact status	½ Mod	MZ201
Auxiliary Contacts & Alarm Induction Allows indication of MCB status when turned off or tripped	½ Mod	MZ202
Shunt Trip 230V - 415V A.C. 110V - 130V D.C. 24 - 48V A.C. 12 - 48V D.C.	1 Mod	MZ203
Under Voltage Release 230V A.C. 48V D.C.	1 Mod	MZ206
	1 Mod	MZ205





EPN510



EPN520



EPN518

Latching Relays

Description

- Operate when impulsed by a signal voltage.
- The impulse can be provided via a pushbutton or pushswitch. The first pulse operates the relay and latches it to its set (opposite) state, the next operation of the pushbutton returns the relay to its reset (original) state.
- Auxiliary contacts (**EPN050, EPN051**).
- Are available for remote signalling and centralised control applications and can be easily combined with the latching relays.
- Connection: 10mm² flexible, 6mm² rigid.

Coil	Power Circuit AC1	Width (1 Mod =17.5mm)	Cat ref.
Latching Relay 1 NO			
230V 50Hz	16A - 250V A.C.	1 Mod	EPN510
24V 50Hz	16A - 250V A.C.	1 Mod	EPN513
Latching Relay 2 NO			
230V 50Hz	16A - 250V A.C.	1 Mod	EPN520
24V 50Hz	16A - 250V A.C.	1 Mod	EPN524
12V 50Hz	16A - 250V A.C.	1 Mod	EPN521
Latching Relay 1 NC + 1 NO			
230V 50Hz	16A - 250V A.C.	1 Mod	EPN515
24V 50Hz	16A - 250V A.C.	1 Mod	EPN518
12V 50Hz	16A - 250V A.C.	1 Mod	EPN519
Latching Relay 2 NC + 2 NO			
230V 50Hz	16A - 250V A.C.	2 Mod	EPN525
24V 50Hz	16A - 250V A.C.	2 Mod	EPN528
12V 50Hz	16A - 250V A.C.	2 Mod	EPN529
Latching Relay 4 NO			
230V 50Hz	16A - 400V A.C.	2 Mod	EPN540
24V 50Hz	16A - 400V A.C.	2 Mod	EPN541

Auxiliary Contacts

Description	Power Circuit	Width (1 Mod =17.5mm)	Cat ref.
Auxiliary Contact	2A - 250V A.C.	½ Mod	EPN051
Auxiliary Contacts for Centralised Control	110-230V A.C.	½ Mod	EPN050



EPN050

Relays

Characteristics

- To provide control of low power circuits max 16A; associated with switches, time switches etc for remote control applications.
- The relays will accept an auxiliary contact for remote signalling applications (**ESC080**).
- For the command of ELV circuits use interface relays **EN145** and **EN146**.
- For the command of high power circuits (20, 40 & 63 Amps) use contactors as shown on page 55.



ERD218

Coil AC Voltage	Power Circuit AC1	Width (1 Mod =17.5mm)	Cat ref.
Relays 1 NC + 1 NO			
230V 50Hz	16A - 250V~	1 Mod	ERC218
24V 50Hz	16A - 250V~	1 Mod	ERD218
8/12V 50Hz	16A - 250V~	1 Mod	ERL218
Relays 2 NC + 2 NO			
230V 50Hz	16A - 250V~	2 Mod	ERC418
24V 50Hz	16A - 250V~	2 Mod	ERD418
8/12V 50Hz	16A - 250V~	1 Mod	ERL418

Low Noise Contactors

Description

- For the remote switching and control of power circuits where noise may be a concern i.e. hotel bedrooms etc.

Technical Data

- The choice of contactor depends upon a number of parameters, e.g. The nature of the supply, the power it is switching, the characteristics of the load, the control voltage required & number of operations.
- All contactor ratings are for AC1 loads only – if the load differs from AC1 the contactor may need de-rating
- The use of **LZ060** (heat dissipation inserts) between all contactors installed or between contactors and adjacent devices is required.
- For technical data, see page 107.

Options

- Contact choice: Normally open (NO), Normally closed (NC).

Description	Coil AC Voltage	Power Circuit	Width (1 Mod =17.5mm)	Cat ref.
25A 2NO	230V 50Hz	25A - 400V A.C.	1 Mod	ESC225S
40A 2NO	230V 50Hz	40A - 400V A.C.	3 Mod	ESC240S
63A 2NO	230V 50Hz	63A - 400V A.C.	3 Mod	ESC263S
25A 3NO	230V 50Hz	25A - 400V A.C.	2 Mod	ESC325S
40A 3NO	230V 50Hz	40A - 400V A.C.	3 Mod	ESC340S
25A 3NO + 1NC	230V 50Hz	25A - 400V A.C.	2 Mod	ESC428S
25A 4NO	230V 50Hz	25A - 400V A.C.	2 Mod	ESC425S
40A 4NO	230V 50Hz	40A - 400V A.C.	3 Mod	ESC440S
63A 4NO	230V 50Hz	63A - 400V A.C.	3 Mod	ESC463S
25A 4NC	230V 50Hz	25A - 400V A.C.	2 Mod	ESC426S



ESC225S



ESC463S

Auxiliaries & Accessories

Description	Power Circuit	Width (1 Mod =17.5mm)	Cat ref.
Heat Dissipation Insert	-	½ Mod	LZ060
Sealable Terminal Cover for 1 Module Contactors	-	-	ESC001
Sealable Terminal Cover for 2 Module Contactors	-	-	ESC002
Sealable Terminal Cover for 3 Module Contactors	-	-	ESC003
1NO + 1NC Auxiliary Contact	6A - 250V A.C.	½ Mod	ESC080



ESC001



ESC002



ESC080



ESC225



ESC425

Standard Contactors

Description

- For the remote switching and control of power circuits (25A-63A AC1)

Technical Data

- The choice of contactor depends upon a number of parameters, e.g. the nature of the supply, the power it is switching, the characteristics of the load, the control voltage required, number of operations.
- All contactor ratings are for AC1 loads only – if the load differs from AC1 the contactor may need de-rating (see technical characteristics on page 108).
- The use of **LZ060** (heat dissipation inserts) between all contactors installed or between contactors and adjacent devices is required.

Options

- Contact choice
- Normally open (NO)
- Normally closed (NC)

Auxiliary

- All contactors will accept auxiliary, **ESC080** contact.

Description	Coil AC voltage	Power circuit AC1	Width (1 Mod =17.5mm)	Cat ref.
25A 1NO	230V 50Hz	25A - 250V~	1 Mod	ESC125
25A 2NO	230V 50Hz	25A - 250V~	1 Mod	ESC225
25A 2NO Manual Override	230V 50Hz	25A - 250V~	1 Mod	ERC225
40A 2NO	230V 50Hz	40A - 400V~	3 Mod	ESC240
63A 2NO	230V 50Hz	63A - 400V~	3 Mod	ESC263
25A 2NO	24V 50Hz	25A - 250V~	1 Mod	ESD225
25A 2NO Manual Override	24V 50Hz	25A - 250V~	1 Mod	ERD225
40A 2NO	24V 50Hz	40A - 250V~	3 Mod	ESD240
25A 2NO	24V 50Hz	25A - 250V~	1 Mod	ESD225 ★
63A 2NO	24V AC 50Hz	63A - 250V~	3 Mod	ESD263 ★
25A 2NC	230V 50Hz	25A - 250V~	1 Mod	ESC226
25A 2NO + 2NC	230V 50Hz	25A - 400V~	2 Mod	ESC427 ★
40A 2NO + 2NC	230v 50Hz	40A - 400V~	3 Mod	ESC442 ★
25A 1NO + 1NC	24V 50Hz	25A - 250V~	1 Mod	ESD227
25A 1NO + 1NC	230V 50Hz	25A - 250V~	1 Mod	ESC227 ★
25A 3NO	230V 50Hz	25A - 400V~	2 Mod	ESC325
25A 3NO Manual Override	230V 50Hz	25A - 400V~	3 Mod	ERC326
40A 3NO	230V 50Hz	40A - 400V~	3 Mod	ESC340
40A 3NO + 1NC	230V 50Hz	40A - 400V~	3 Mod	ESC443
63A 3NO + 1NC	230V 50Hz	63A - 400V~	3 Mod	ESC466
25A 4NO	230V 50Hz	25A - 400V~	2 Mod	ESC425
40A 4NO	230V 50Hz	40A - 400V~	3 Mod	ESC440
63A 4NO	230V 50Hz	63A - 400V~	3 Mod	ESC463
25A 4NO	24V 50Hz	25A - 400V~	2 Mod	ESD425
25A 4NC	230V 50Hz	25A - 400V~	2 Mod	ESC426
40A 4NC	230V 50Hz	40A - 400V~	3 Mod	ESC441
63A 4NC	230V 50Hz	63A - 400V~	3 Mod	ESC464
63A 2NC + 2NO	230V 50Hz	63A - 250V~	3 Mod	ESC465

Override Contactors

Description

- Manual override facility allows temporary override, with automatic return at next coil energisation. Permanent off can also be selected. **ETC225S** is a low noise version.

Technical Data

- The choice of contactor depends upon a number of parameters, e.g. the nature of the supply, the power it is switching, the characteristics of the load, the control voltage required, number of operations.
- All contactors ratings are for AC1 loads only – if the load differs from AC1 the contactor may need de-rating (see technical characteristics on page 108).
- The use of **LZ060** (heat dissipation inserts) between all contactors installed or between contactors and adjacent devices is recommended.

Options

- Contact choice
- Normally open (NO)
- Normally closed (NC)

Auxiliary

Coil AC voltage	Power circuit AC1	Width (1 Mod =17.5mm)	Cat ref.
2 NO			
230V 50 Hz	25A - 250V~	1 Mod	ETC225S
230V 50 Hz	25A - 250V~	1 Mod	ETC225
3 NO			
230V 50 Hz	20A - 400V~	2 Mod	ETC325
230V 50 Hz	40A - 400V~	3 Mod	ETC340
4 NO			
230V 50 Hz	20A - 400V~	2 Mod	ETC425
230V 50 Hz	40A - 400V~	3 Mod	ETC440



ETC225S



ETC340



ETC425

Auxiliary for 25A Contactors

Power circuit AC1	Width (1 Mod =17.5mm)	Cat ref.
2A - 250V~	½ Mod	ESC080

Accessories

Description	Width (1 Mod =17.5mm)	Cat ref.
Heat Dissipation Insert	½ Mod	LZ060



MM501N

Motor Starters

- To ensure localised control and protection of single and three phase motors.

Technical Data

- Adjustable thermal relay

- AC 3 utilisation category

Connection capacity

- 2 conductors: Max size flexible 1 to 4mm², rigid 1.5 to 6mm²

Options

- Conforms to IEC 947-1, IEC 947-2 (appropriate parts of)

Current setting	Standard power ratings of 3 phase motors 50/60Hz (A.C. 3 category)		Width (1 Mod = 17.5mm)	Cat ref.
	230V (kW)	400V (kW)		
0.1 - 0.16A	-	-	-	MM501N
0.16 - 0.25A	-	0.06	2 ½ Mod	MM502N
0.25 - 0.4A	0.06	0.09	2 ½ Mod	MM503N
0.4 - 0.6A	0.09	0.12	2 ½ Mod	MM504N
0.6 - 1.0A	0.09	0.12	2 ½ Mod	MM505N
1.0 - 1.6A	0.25	0.55	2 ½ Mod	MM506N
1.6 - 2.5A	0.55	0.8	2 ½ Mod	MM507N
2.5 - 4A	0.8	1.5	2 ½ Mod	MM508N
4 - 6A	1.5	2.5	2 ½ Mod	MM509N
6 - 10A	2.5	4	2 ½ Mod	MM510N
10 - 16A	4	7.5	2 ½ Mod	MM511N
16 - 20A	5.5	9	2 ½ Mod	MM512N
20 - 25A	7.5	12.5	2 ½ Mod	MM513N



MZ520N

Auxiliary & Alarm Contacts for Motor Starters

- Auxiliary Contacts - Act as an indicating device to monitor the ON or OFF position.

- Alarm Contact - Mounted inside the motor starter

Characteristics	Width (1 Mod = 17.5mm)	Cat ref.
Auxiliary Contacts 1 Normally Closed + 1 Normally Open 2A AC 1 - 400V A.C.	½ Mod	MZ520N
Alarm Contact 1 Normally Closed 1A AC 1 - 400V A.C. / 2A AC 1 - 230V A.C.	½ Mod	MZ527N



MZ528N

Under Voltage Release for Motor Starters

- To prevent automatic restarting of the controlled device

Characteristics	Cat ref.
230V A.C. 50Hz	MZ528N
400V A.C. 50Hz	MZ529N



MZ521N

Surface Mounting Enclosure for Motor Starters

Description	Dimensions (H x W x D mm)	Cat ref.
IP55 Surface Mounting Enclosure for Motor Starter	78 x 150 x 95	MZ521N



MZ530N

Emergency Stop Button

Description	Cat ref.
IP65 External Emergency Stop Button	MZ530N

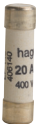
SPSN Fuse Carriers (supplied without cartridge fuse)

- Characteristics**
- Protection and control of circuits against overloads and short-circuits.
- Technical Data**
- Characteristics type (fuse) gF
 - Short-circuit rating: 4kA (10-20A), 6kA (25 & 32A).
 - Voltage rating - 250V A.C.
 - Connection Capacity: Rigid 16mm², Flexible 10mm²

Rating	Width (1 = 17.5mm)	Cat. ref. SPSN Fuse Carrier	Cat. ref. Fuse Type gF
10A	1 Mod	L12401	LF138
16A	1 Mod	L12501	LF139
20A	1 Mod	L12601	LF140
25A	1 Mod	L12701	LF141
32A	1 Mod	L12801	LF142



L12401



LF140



LF138

Surge Protection Kits

Characteristics

- Developed to ensure effective protection of end equipment from fast transient overvoltages, where supplied from Hager Commercial distribution boards.
- Solid copper Earth links on all SPD kits and other design principles ensure optimum protection of end equipment through validated low U_p effective SPD performance.
- For more information on these Surge Protection Kits see distribution board pages.

Surge Protection Kits for 125A TP&N Boards

	Cat ref.
Type 1 & 2 Surge Protection Kit for 125A Boards (& power and lighting boards *TM)	JK101SPD
Type 2 Surge Protection Kit for 125A Boards (& power and lighting boards *TM)	JK102SPD

Surge Protection Kits for 250A TP&N Boards

Type 1 & 2 Surge Protection Kit for 250A Boards (& tri board - JKD2884TM)	JK201SPD
Type 2 Surge Protection Kit for 250A Boards (& tri board - JKD2884TM)	JK202SPD
Type 1 & 2 SPD kit for side by side 250A TPN boards	JKD201SPD
Type 2 SPD kit for side by side 250A TPN boards	JKD202SPD

Surge Protection Kits for JN Panelboards

SPD kit Type 1+2 for JN Panelboards	JN201SPD
SPD kit Type 2 for JN Panelboards	JN202SPD

Surge Protection Kit for JF Panelboards

SPD kit Type 1 + 2 for JF Panelboards	JF861SPD
---------------------------------------	-----------------

800A JHF Panelboard Surge protection device kit

Characteristics:

- SPD kit for direct integration within JHF Panelboards
- Type 1 + 2 SPD with integrated fuses to facilitate direct connection to main busbars
- SPD suitable for TN/TT Earth arrangements including TNC-S (PME)
- CT2 type SPD to accommodate multiple Earth arrangements

Description	Cat ref.
SPD kit Type 1 + 2 for JHF Panelboards	JHF861SPD



VME02SPD

Type A SP&N Distribution Board SPD Kit Type 2

- Consists of: 6mm earth cables, 1x double pole surge protection device with lifetime indicator & Busbar.

Poles	I_n kA L-N	I_n kA N-PE	U_p kV	Width (mm)	Cat ref.
2	5	15	≤ 1.2	35	VME02SPD

Consumer Unit Type 1+2 Surge Protection Kit

- Consists of: 6mm earth cables, 1x double pole surge protection device with lifetime indicator & Busbar.

Poles	I_n kA L-N	I_n kA N-PE	U_p kV	Width (mm)	Cat ref.
2	15	25	≤ 1.2	35	VME01SPD

(Does not work with 100A RCCB incomer)

Devices

(Note: 3 x SPA180 + 1x SPA180N are required for 3 Phase supply)

	SPD Type	Suitable for Earthing system	Modules	I_{imp} L-N	I_{imp} N-PE	U_p kV	I_n	Single or three phase system	Width (mm)	Remote contact	Integrated back-up fuse	Cat ref.
	1+2	TNS/TT	4	25kA		1.5kV	3		142.4	Yes	No	SPA801
	1+2	TNS/TT		12.5kA	50kA	1.2kV	3		71.2	Yes	No	SPA932
Type 2	2	TNS/TT	4			1.5kV	40kA	3		No	No	SPB440D
	2	TNS/TT	4			1.5kV	40kA	3	71.2	Yes	No	SPB440R
Type 3	3	TNS/TT	1	5kA		1.5kV		Single	17.5	Yes	Yes	SPC203N
Type 3	3	TNS/TT	2	3kA				3Phase	35.2	Yes	Yes	SPC403N

Description	Cat ref.
Linking busbar	KBN381

DC SPD

Type 2	N/A	TNS/TT	3	N/A	N/A	1.9kV	N/A	51.0	No	No	SPV340
--------	-----	--------	---	-----	-----	-------	-----	------	----	----	---------------



SPA180



SPA180N



SPA801



SPA932



SPB440R

Replacement Cartridges

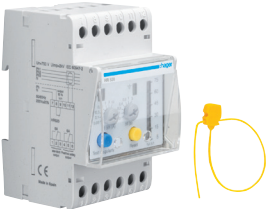
SPD part number	Cartridge part number
SPV340	SPV040
SPA180	SPA080
SPA180N	SPA001N
SPA801	L/N SPA801 N/PE SPA001N
SPA932	L/N SPA091 N/PE SPB091N
SPB440D	L/N SPB040D
SPB440R	N/PE SPB040N



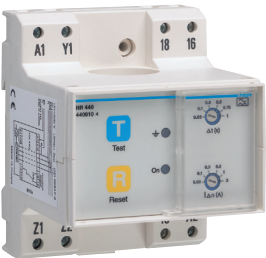
HR500



HR510



HR520



HR440



HR441

Earth Fault Relays

Characteristics

- Provides monitoring of earth fault currents. When the fault current rises above the selected level, the output contacts of the product operate.
- Depending on the relay selected, it can have either fixed or adjustable sensitivity. A time delay is also available for selectivity purposes. The relays are linked with detection torroids, available in circular and rectangular variants.
- Positive safety: the relay trips in the event of a break in the relay/torroid link.
- Positive reset required after a fault is detected.
- Test button for simulation of a fault.
- Protected against nuisance tripping from transients.
- Conforms to BS EN 61008.

Technical Data

- Type A RCD protection.
- Output: 1 C/O contact, 250V A.C. 5/6A AC1.
- Visual display of fault by red LED.

Specific device features of HR525 & HR534.

- Display of fault current before it triggers the relay (5% to 75%).
- Extra output contact (250V 0.1A max.) to enable remote indication if fault currents over 50% of $I_{\Delta n}$.
- Remote test and reset

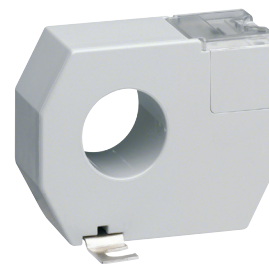
Connection capacity

- Relay - 1.5 to 6mm²
- Relay - torroid link: 2 wires, 25m max.
- Test and remote reset link: 3 wires, 20m max.

Description	Characteristics	Width	Cat ref.
Earth Fault Relay with Separate Detection Torroids			
Earth fault relay C/O contact 5A A.C.1	Instant trip, fixed sensitivity $I_{\Delta n} = 30\text{mA}$	1 Mod	HR500
Earth fault relay C/O contact 5A A.C.1	Instant trip, fixed sensitivity $I_{\Delta n} = 300\text{mA}$	1 Mod	HR502
Earth fault relay C/O contact 6A A.C.1	Adjustable sensitivity $I_{\Delta n} = 30\text{mA}, 100\text{mA}, 300\text{mA}$ 500mA, 1A, 3A, 10A Instant trip or time delay 0.1 - 0.3 - 0.4 - 0.5 - 1 - 3 secs	3 Mod	HR510
Earth fault relay C/O contact 6A A.C.1	Adjustable sensitivity $I_{\Delta n} = 30\text{mA}, 100\text{mA}, 300\text{mA}$ 500mA, 1A, 3A, 10A LED optical scale Instant trip or time delay 0.1 - 0.3 - 0.4 - 0.5 - 1 - 3 secs	3 Mod	HR520
Earth fault relay C/O contact 6A A.C.1	Adjustable sensitivity $I_{\Delta n} = 500\text{mA}, 1\text{A}, 3\text{A}, 5\text{A},$ 10A, 20A & 30A LED optical scale Instant trip or time delay 0.1 - 0.2 - 0.25 - 0.3 - 0.4 - 0.5 secs	3 Mod	HR523
Earth fault relay C/O contact 6A A.C.1 Trip / reclose input feature	Adjustable sensitivity $I_{\Delta n} = 30\text{mA}, 100\text{mA}, 300\text{mA},$ 500mA, 1A, 3A, 5A, 10A & 30A LCD Display Instant trip or time delay 0.02 - 0.1 - 0.3 - 0.4 - 0.5 - 1 - 3 - 5 - 10 secs	3 Mod	HR525

Circular Section Torroids

Characteristics	Cat ref.
30mm Diameter	HR700
35mm Diameter	HR701
70mm Diameter	HR702
105mm Diameter	HR703
140mm Diameter	HR704
210mm Diameter	HR705



HR702

Rectangular Section Torroids

Dimensions	Cat ref.
70 x 175mm	HR830
115 x 305mm	HR831
150 x 350mm	HR832



HR830

Rectangular Split Torroids

Characteristics	Cat ref.
20 x 30mm	HR820
50 x 80mm	HR821
80 x 80mm	HR822
80 x 121mm	HR823
80 x 161mm	HR824



HR820



HDA125Z

Moulded Case Circuit Breakers x160 18kA

Characteristics

- Thermal magnetic trip unit, two versions: Z/E version: fixed thermal and fixed magnetic. U version: adjustable thermal and fixed magnetic.
- Access to mechanical test button on cover.
- Lockable cover protects MCCB settings.
- Integrated padlocking handle: Ø 4mm.
- Connection capacity: 95mm² rigid cables, 70mm² flexible cables.
- Cage terminals
- Conforms to BS EN 60947-2.
- Fixed thermal: 1x I_n
- Adjustable thermal: 0.63 - 0.8 - 1 x I_n
- For technical details see table on page 121.

Description	Breaking Capacity	Cat ref. 1 pole	Cat ref. 3 pole
Moulded Case Circuit Breakers, 18kA, Fixed Thermal			
MCCBs x160 - 16A	I _{cu} / I _{cs} : 18 kA	HDA014E ★	HDA016Z
MCCBs x160 - 20A	I _{cu} / I _{cs} : 18 kA	HDA018E ★	HDA020Z
MCCBs x160 - 25A	I _{cu} / I _{cs} : 18 kA	HDA023E ★	HDA025Z
MCCBs x160 - 32A	I _{cu} / I _{cs} : 18 kA	HDA030E ★	HDA032Z
MCCBs x160 - 40A	I _{cu} / I _{cs} : 18 kA	HDA038Z ★	HDA040Z
MCCBs x160 - 50A	I _{cu} / I _{cs} : 18 kA	HDA048Z ★	HDA050Z
MCCBs x160 - 63A	I _{cu} / I _{cs} : 18 kA	HDA061Z ★	HDA063Z
MCCBs x160 - 80A	I _{cu} / I _{cs} : 18 kA	HDA078Z ★	HDA080Z
MCCBs x160 - 100A	I _{cu} / I _{cs} : 18 kA	HDA098Z ★	HDA100Z
MCCBs x160 - 125A	I _{cu} / I _{cs} : 18 kA	HDA123Z ★	HDA125Z

Moulded Case Circuit Breakers, 18kA, Adjustable Thermal

MCCBs x160 - 25A	I _{cu} / I _{cs} : 18 kA	-	HDA025U
MCCBs x160 - 40A	I _{cu} / I _{cs} : 18 kA	-	HDA040U
MCCBs x160 - 63A	I _{cu} / I _{cs} : 18 kA	-	HDA063U
MCCBs x160 - 80A	I _{cu} / I _{cs} : 18 kA	-	HDA080U
MCCBs x160 - 100A	I _{cu} / I _{cs} : 18 kA	-	HDA100U
MCCBs x160 - 125A	I _{cu} / I _{cs} : 18 kA	-	HDA125U

Moulded Case Circuit Breakers 25kA Fixed Thermal

MCCBs x160 - 16A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA014E ★	HHA016Z
MCCBs x160 - 20A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA018E ★	HHA020Z
MCCBs x160 - 25A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA023E ★	HHA025Z
MCCBs x160 - 32A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA030E ★	HHA032Z
MCCBs x160 - 40A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA038Z ★	HHA040Z
MCCBs x160 - 50A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA048Z ★	HHA050Z
MCCBs x160 - 63A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA061Z ★	HHA063Z
MCCBs x160 - 80A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA078Z ★	HHA080Z
MCCBs x160 - 100A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA098Z ★	HHA100Z
MCCBs x160 - 125A	I _{cs} : 20 kA, I _{cu} : 25 kA	HHA123Z ★	HHA125Z

Moulded Case Circuit Breakers 25kA Adjustable Thermal

MCCBs x160 - 25A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA025U
MCCBs x160 - 40A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA040U
MCCBs x160 - 63A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA063U
MCCBs x160 - 80A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA080U
MCCBs x160 - 100A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA100U
MCCBs x160 - 125A	I _{cs} : 20 kA, I _{cu} : 25 kA	-	HHA125U

Accessories for x160 Devices

Indication contacts

- 1 changeover switch (ON/OFF): indicates the position of the MCCB "open" or "close".
- 1 changeover alarm contact: indicates MCCB tripped.

Coil connection

- Connection capacity: 0.75 mm² flexible or rigid cables
- The cable capacity of the terminals is 0.5 to 1.25mm².

Shunt trip

- Remote tripping of MCCBs
- Operating voltage: 0.7 to 1.1 x U_N

Under voltage release

- Enables tripping of MCCBs or moulded case switches when voltage level drop between 35 and 70% of U_N. Pick up voltage 0.85 x U_N.
- Padlockable direct rotary handle is equipped with front cover and handle, fixing without additional screws.

Description	Cat ref.
Auxiliary Contacts	
1 Changeover contact (On/Off), 250V A.C. / 3A, 125V D.C. / 0.4A, 1 NO+ 1 NC	HXA021H
1 Changeover alarm contact, 250 V A.C. / 3A, 125 V D.C. / 0.4A, NO + 1 NC	HXA024H
Low level contact (On/Off), 125V A.C. , NO + 1 NC	HXA025H
Low Level alarm contact, 125 V A.C. , NO + 1 NC	HXA026H
Shunt Trips	
24V DC	HXA001H
48V DC	HXA002H
100-120V A.C.	HXA003H
200-240V A.C.	HXA004H
380-450V A.C.	HXA005H
Undervoltage Releases	
24V DC	HXA011H
100-120V A.C.	HXA013H
200-240V A.C.	HXA014H
380-450V A.C.	HXA015H
Delayed Undervoltage Releases	
24V DC	HXA051H
100-120V A.C.	HXA053H
200-240V A.C.	HXA054H
380-450V A.C.	HXA055H
Accessories	
Locking Device to Mount on MCCB for Handle Locking for 3 Padlock Max ø 8mm	HXA039H
Set of Three Extended Spreader Connections	HYA014H
Pair of Terminal Covers for Extended Straight Connections 1 Pole	HYA029H
Pair of Terminal Covers for Extended Straight Connections 3 Pole	HYA021H
Pair of Terminal Covers for Extended Spreader Connections	HYA023H



HXA021H

HXA024H



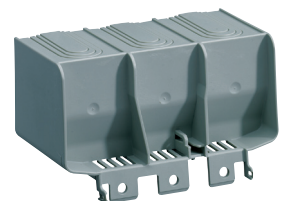
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HXA039H



HYA021H



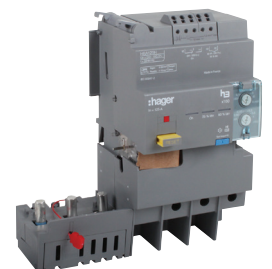
HYA023H

Add-On Blocks for x160 Devices

Characteristics

- These devices are intended to be fixed on the right side of the devices.
- Type A RCD protection for protection against pulsating D.C.
- High Immunity reduces unexpected tripping (generated by micro-processing, electronic ballast etc.).
- Fixed version: 300 mA sensitivity and instantaneous tripping, adjustable version: adjustable sensitivity and time delay.
- Test button for electrical functioning check.
- LED fault indication and auxiliary output for remote indication - (25-50% I_{ΔN}).
- Assembly and disassembly facilitated by the drawer assembly system.
- Connection capacity: 95 mm² rigid cables, 70 mm² flexible cables.
- Sensitivity I_{ΔN}, adjustable: 0.03 - 0.1 - 0.3 - 1 - 3 - 6A
- Adjustable tripping: instantaneous or time delay: 0.06 - 0.15 - 0.3, 0.5 - 1s
- Conforms to BS EN 60947-2.

Description	Cat ref. 3P
Fixed Add-on Block - 125A	HBA127H
Adjustable Add-on Block - 125A	HBA125H
Adjustable Add-on Block - 160A	HBA160H



HBA125H



HNB100Z

Moulded Case Circuit Breakers x250 25kA

Characteristics

- Thermal magnetic trip unit, two versions: Z version: fixed thermal and fixed magnetic. H version: adjustable thermal magnetic.
- Access to mechanical test button on cover.
- Lockable cover protects MCCB settings.
- Integrated padlocking handle: Ø 4mm.
- Connection capacity: 150mm² rigid cables, palm lug max. width: 25mm
- Conforms to BS EN 60947-2
- AC 22/23A.
- For technical data see page 131.

x250 25kA

- Fixed thermal: $1 \times I_n$
- Fixed magnetic: $> 10 \times I_n$

x250 40kA

- Adjustable thermal: 0.63, 0.8, $1 \times I_n$
- Adjustable magnetic: 6 - 8 - 10 - $13 \times I_n$ (100 - 200A). 5 - 7 - 9 - $11 \times I_n$ (250A).

Description	Breaking capacity	Cat ref. 3P
Moulded Case Circuit Breakers 25kA - Fixed		
MCCBs x250 - 100A	I_{cs} : 20 kA, I_{cu} : 25 kA	HNB100Z
MCCBs x250 - 125A	I_{cs} : 20 kA, I_{cu} : 25 kA	HNB125Z
MCCBs x250 - 160A	I_{cs} : 20 kA, I_{cu} : 25 kA	HNB160Z
MCCBs x250 - 200A	I_{cs} : 20 kA, I_{cu} : 25 kA	HNB200Z
MCCBs x250 - 250A	I_{cs} : 20 kA, I_{cu} : 25 kA	HNB250Z
Moulded Case Circuit Breakers 40kA - Fixed		
MCCBs x250 - 100A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB100Z
MCCBs x250 - 125A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB125Z
MCCBs x250 - 160A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB160Z
MCCBs x250 - 200A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB200Z
MCCBs x250 - 250A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB250Z
Moulded Case Circuit Breakers 40kA - Adjustable		
MCCBs x250 - 100A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB100H
MCCBs x250 - 125A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB125H
MCCBs x250 - 160A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB160H
MCCBs x250 - 200A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB200H
MCCBs x250 - 250A	I_{cs} : 20 kA, I_{cu} : 40 kA	HNB250H

Accessories for x250 Devices

Indication contacts

- 1 changeover switch (ON/OFF): indicates the position of the MCCB "open" or "close".
- 1 changeover alarm contact: indicates MCCB tripped.

Coil connection

- Connection capacity: 0.75 mm² flexible or rigid cables
- The cable capacity of the terminals is 0.5 to 1.25mm².

Shunt trip

- Remote tripping of MCCBs
- Operating voltage: 0.7 to 1.1 x U_N

Under voltage release

- Enables tripping of MCCBs or moulded case switches when voltage level drop between 35 and 70% of U_N. Pick up voltage 0.85 x U_N
- Padlockable direct rotary handle is equipped with front cover and handle, fixing without additional screws.

Description	Cat ref.
Auxiliary Contacts	
1 Changeover contact (On/Off), 250V A.C. / 3A, 125V D.C. / 0.4A, 1 NO+ 1NC	HXA021H
1 Changeover alarm contact, 250 V A.C. / 3A, 125 V D.C. / 0.4A, NO + 1 NC	HXA024H
Low level contact (On/Off), 125V A.C. , NO + 1 NC	HXA025H
Low Level alarm contact, 125 V A.C. , NO + 1 NC	HXA026H
Shunt Trips	
24V DC	HXA001H
48V DC	HXA002H
100-120V A.C.	HXA003H
200-240V A.C.	HXA004H
380-450V A.C.	HXA005H
Undervoltage Releases	
24V DC	HXA011H
100-120V A.C.	HXA013H
200-240V A.C.	HXA014H
380-450V A.C.	HXA015H
Delayed Undervoltage Releases	
24V DC	HXA051H
100-120V A.C.	HXA053H
200-240V A.C.	HXA054H
380-450V A.C.	HXA055H
Accessories	
Locking Device to Mount on MCCB for Handle Locking for 3 Padlock Max ø 8mm	HXA039H
Set of Four Extended Straight Connections	HXB010H
Set of Four Extended Spreader Connections	HYB011H
Set of Three Interphase Barriers	HYB019H
Pair of Terminal Covers for Extended Straight Connections	HYB021H
Pair of Terminal Covers for Extended Spreader Connections	HYB023H



HXA021H

HXA024H



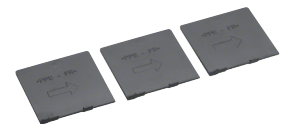
HXA014H



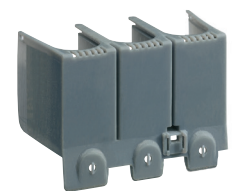
HXA039H



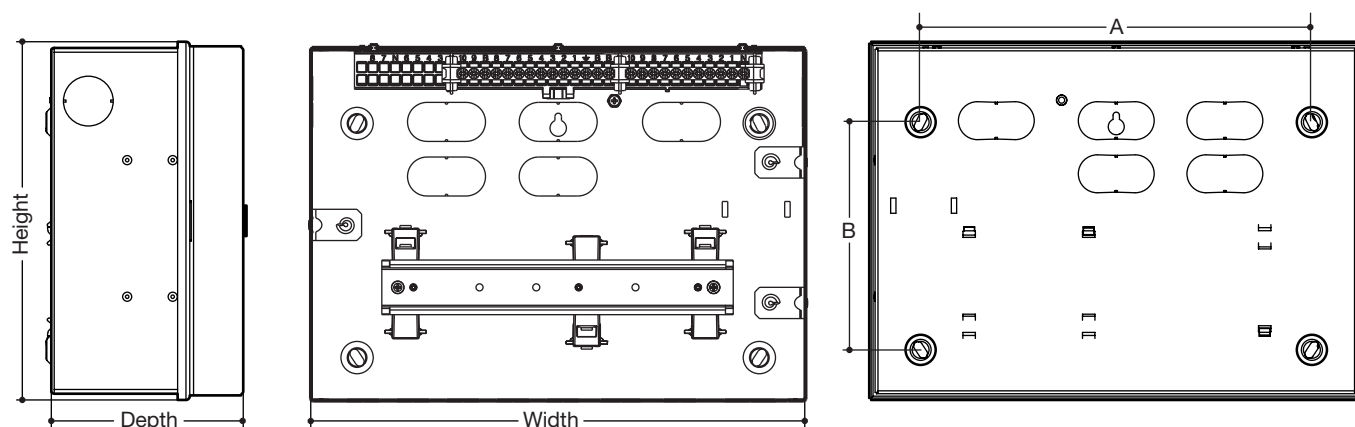
HYB010H



HYB019H



HYB021H

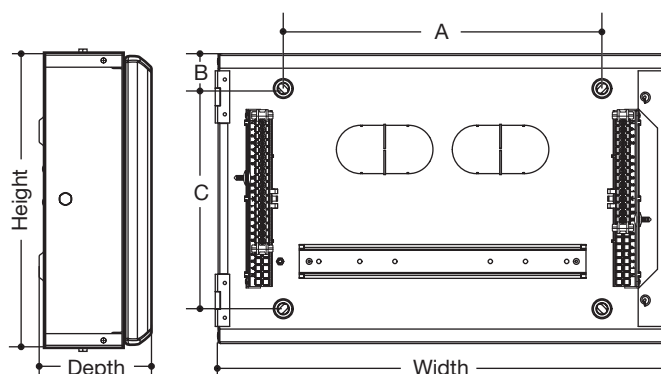


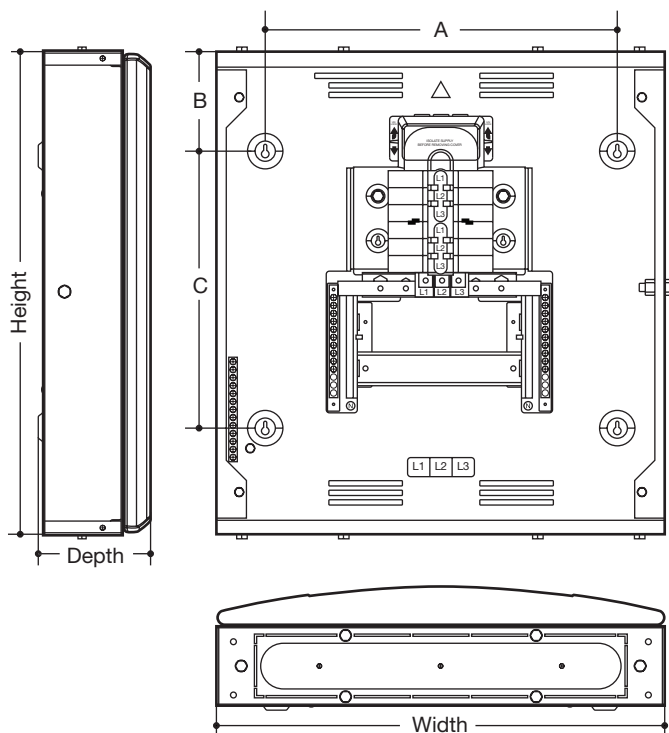
SP&N A Boards

Enclosure Size	Dimensions			Fixing Centres		Knockout Size	N° of Knockouts				
	Width	Height	Depth	A	B		Top	Bottom	Left	Right	Back
3	254	236	125	186	150	ø 20	3	3	-	-	-
						ø 32	1	1	1	1	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	3
4	326	236	125	258	150	ø 20	6	6	-	-	-
						ø 32	1	1	1	1	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	5
5	398	236	125	330	150	ø 20	8	8	-	-	-
						ø 32	1	1	1	1	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	7
7	505	236	125	437	150	ø 20	11	11	-	-	-
						ø 32	1	1	1	1	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	9
4 (2)	326	472	125	258	388	ø 20	6	6	-	-	-
						ø 32	1	1	2	2	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	6
5 (2)	398	472	125	330	388	ø 20	8	8	-	-	-
						ø 32	1	1	2	2	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	8
7 (2)	505	472	125	437	388	ø 20	11	11	-	-	-
						ø 32	1	1	2	2	-
						ø 25	1	1	-	-	-
						25 x 50	-	-	-	-	10

Invicta 3 SP&N A Boards

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK114A/AG	300	465	107.7	350	35	228
JK129A/AG	450	465	107.7	330	35	378





125A Primary Boards

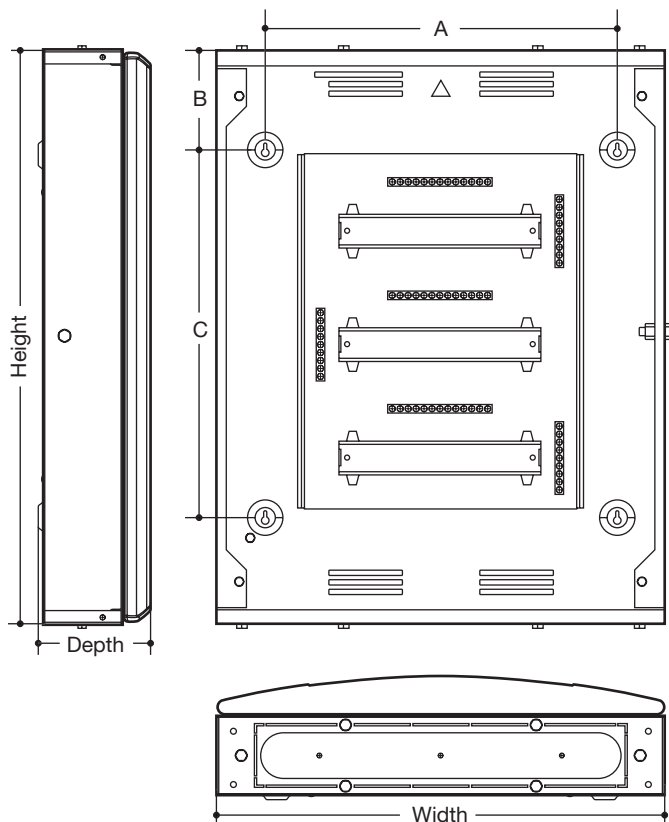
	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK104B/BG/A3	500	465	132.5	365	100	300
JK106B/BG/A3	550	465	132.5	365	100	350
JK108B/BG/A3	625	465	132.5	365	100	425
JK112B/BG/A3	850	465	132.5	365	100	650
JK116B/BG/A3	950	465	132.5	365	100	750
JK118B/BG/A3	1100	465	132.5	365	100	900
JK124B/BG/A3	1250	465	132.5	365	100	1050

250A Primary Boards

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK208B/BG/A3	950	465	165.5	365	100	750
JK212B/BG/A3	1100	465	165.5	365	100	900
JK216B/BG/A3	1250	465	165.5	365	100	1050
JK218B/BG/A3	1400	465	165.5	365	100	1200
JK224B/BG/A3	1550	465	165.5	365	100	1350

Contactor Incomers

	Dimensions (mm)		
	Height	Width	Depth
JK10634C	300	465	165.5
JK11004C	450	465	234.5
JK21604C	450	465	234.5

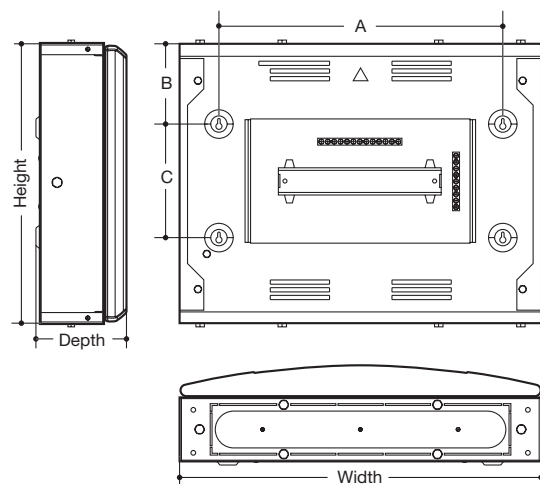


125A Side DIN Enclosures

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK104BDFG	500	465	132.5	365	100	300
JK106BDFG	550	465	132.5	365	100	350
JK108BDFG	625	465	132.5	365	100	425
JK112BDFG	850	465	132.5	365	100	650
JK116BDFG	950	465	132.5	365	100	750

250A Side DIN Enclosures

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK208BDFG	950	465	165.5	365	100	750
JK212BDFG	1100	465	165.5	365	100	900
JK216BDFG	1250	465	165.5	365	100	1050
JK218BDFG	1400	465	165.5	365	100	1200
JK224BDFG	1550	465	165.5	365	100	1350



125A DIN Extension Boxes

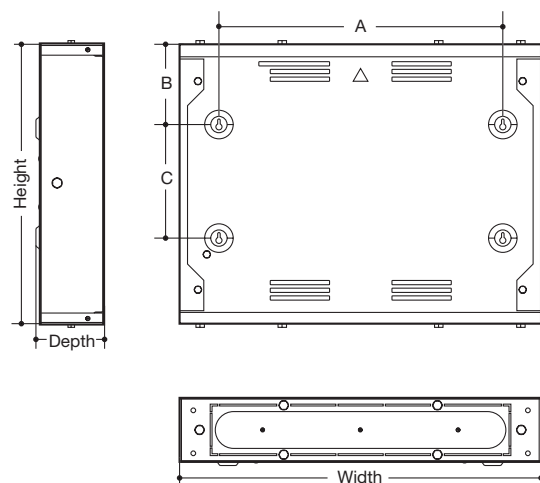
	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK116E/EG	300	465	132.5	365	150	-
JK132E/EG	450	465	132.5	365	80	290

250A DIN Extension Boxes

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK216E/EG	300	465	165.5	365	150	-
JK232E/EG	450	465	165.5	365	80	290

Door Kits

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK116EG/DK	300	465	165.5	365	150	-
JK132EG/DK	450	465	165.5	365	80	290

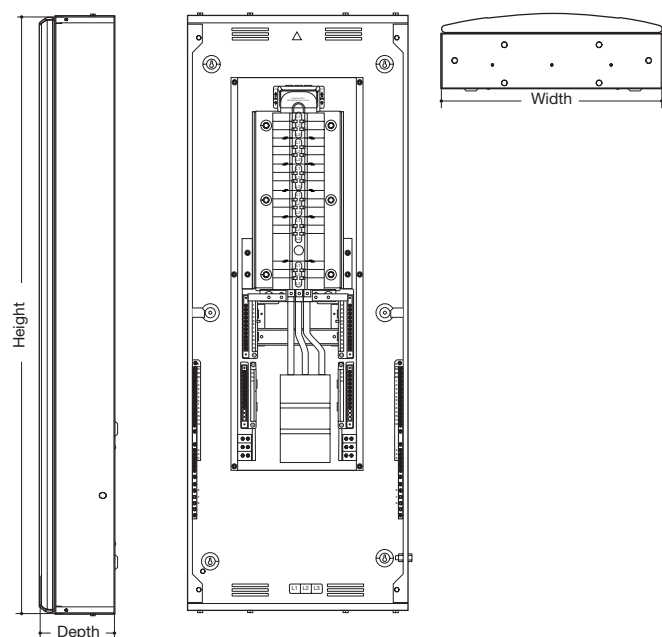


125A Cable Spreader Boxes

	Dimensions (mm)				Fixing Centres (mm)		
	Height	Width	Depth	Depth with optional door	A	B	C
JK101SE	300	465	91.5	132.5	365	150	-
JK102LE	450	465	91.5	132.5	365	80	290

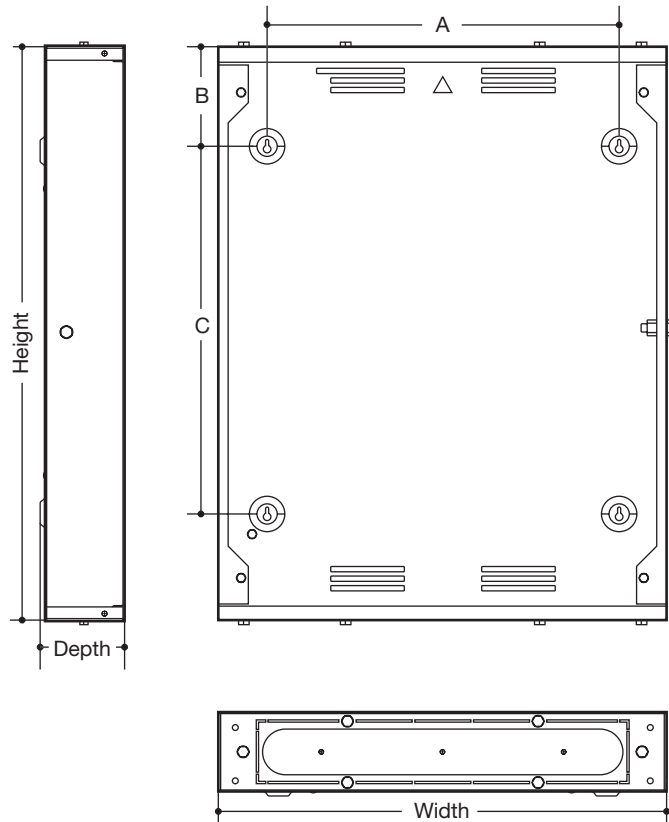
250A Cable Spreader Boxes

	Dimensions (mm)				Fixing Centres (mm)		
	Height	Width	Depth	Depth with optional door	A	B	C
JK201SE	300	465	124.5	165.5	365	150	-
JK202LE	450	465	124.5	165.5	365	80	290



Hybrid 250A TPN Distribution Boards

	Dimensions (mm)		
	Height	Width	Depth
JK20210B/BG	1250	465	165.5
JK20216B/BG	1400	465	165.5
JK20220B/BG	1400	465	165.5
JK20210B/BGSD	1250	465	165.5
JK20216B/BGSD	1400	465	165.5
JK20220B/BGSD	1400	465	165.5



125A Side Extension Boxes

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK104BSF	500	465	91.5	365	100	300
JK106BSF	550	465	91.5	365	100	350
JK108BSF	625	465	91.5	365	100	425
JK112BSF	850	465	91.5	365	100	650
JK116BSF	950	465	91.5	365	100	750

250A Side Extension Boxes

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK208BSF	950	465	124.5	365	100	750
JK212BSF	1100	465	124.5	365	100	900
JK216BSF	1250	465	124.5	365	100	1050
JK218BSF	1400	465	124.5	365	100	1200
JK224BSF	1550	465	124.5	365	100	1350

125A Half Width Side Extension Boxes

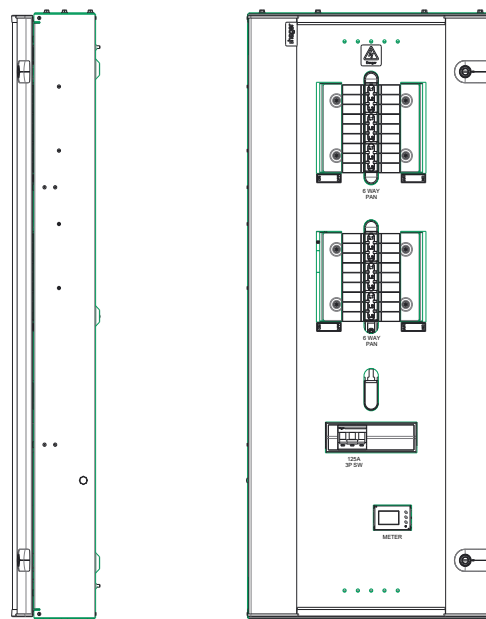
	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK104BSH	500	232.5	91.5	170	100	300
JK106BSH	550	232.5	91.5	170	100	350
JK108BSH	625	232.5	91.5	170	100	425
JK112BSH	850	232.5	91.5	170	100	650
JK116BSH	950	232.5	91.5	170	100	750
JK101BSH	300	232.5	91.5	170	100	100

250A Half Width Side Extension Boxes

	Dimensions (mm)			Fixing Centres (mm)		
	Height	Width	Depth	A	B	C
JK208BSH	950	232.5	124.5	170	100	750
JK212BSH	1100	232.5	124.5	170	100	900
JK216BSH	1250	232.5	124.5	170	100	1050
JK218BSH	1400	232.5	124.5	170	100	1200
JK224BSH	1550	232.5	124.5	170	100	1350
JK201BSH	300	232.5	124.5	170	100	100

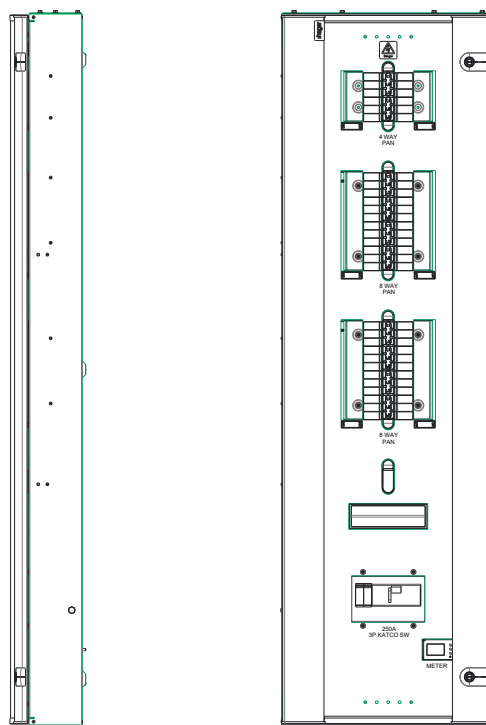
Dual Power & Lighting Boards

	Dimensions (mm)		
	Height	Width	Depth
JKD146TM	1100	465	165.5
JKD166TM	1100	465	165.5
JKD164TM	1100	465	165.5
JKD168TM	1250	465	165.5
JKD188TM	1250	465	165.5
JKD186TM	1250	465	165.5
JKD1416TM	1400	465	165.5
JKD1164TM	1400	465	165.5
JKD1812TM	1400	465	165.5
JKD1128TM	1400	465	165.5
JKD11212TM	1400	465	165.5



Triple Power, Lighting & Services Board

	Dimensions (mm)		
	Height	Width	Depth
JKD2884TM	1550	465	165.5



Torque Settings

			Cables >1.5mm ² Tightening torque (N.m)		Cables ≤1.5mm ² Tightening torque (N.m)		Cable Stripping (mm)
	Pz No.	(mm)	Single Cable	Multi Cables	Single Cable	Multi Cable	
Consumer unit terminals							
Earth and neutral terminal bars	2	6.5	2	2	1.5	1.5	10
Isolation							
Switch Disconnectors / Surge	2	6.5	3.6	3.6	3.6	3.6	15
Circuit protection							
MCB	2	6.5	2.8	2.8	2.8	2.8	13
RCBO	2	5.5	2.1	2.1	2.1	2.1	13
RCCB	2	5.5	2.8	2.8	2.8	2.8	13
AFDD	2	2	2.1	2.1	2.1	2.1	13

Meter Characteristics

Supply	60 to 300V AC, 50/60Hz (±5%)
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Serial Communication

Interface Standard and Protocol	RS485 and MODBUS RTU
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Input (CT)

Pluggable RJ45	Input 1/ Input 2
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Output

Pulse Output:	Voltage Range : 24V DC max
Current Capacity :	100mA max
Pulse Duration :	Selectable Between 0.1 to 2.0sec
Pulse Weight :	Selectable between 0.01 to 9.99kWh

Accuracy of meter

Measurement	Accuracy
Voltage VL-N	0.5% of full range
Voltage VL-L	0.5% of full range
Current A	0.5% of full range
Frequency For L-N Voltage > 20V For L-L Voltage > 35V"	0.1% of full range
Active power	1.0% of full range
Apparent Power	1.0% of full range
Reactive Power	1.0% of full range
Power Factor	±0.01% of full Range
Active Energy	1.0% of full range
Reactive Energy	1.0% of full range
Max/Min Active Power	1.0% of full range
Max/Min Reactive Power	1.0% of full range
Max Apparent Power	1.0% of full range
Power Consumption	Less than 8VA

Characteristics	JK1**	JK2**
Standards	Designed, manufactured and tested to BS EN 61439-3	Designed, manufactured and tested to BS EN 61439-3
Busbar Current Rating	125A	250A
Busbar Type	Fully shrouded copper	Fully shrouded copper
Busbar Rating	25kA Conditional	25kA Conditional
Incoming	100A Switch	250A MCS
	125A Switch	250A MCCB
	63A contactor AC3	160A contactor AC3
	100A contactor AC3	Direct connection
	Direct connection	
	RCCB incomers	
Outgoing Ways	4, 6, 8, 12, 16, 18, 24 Triple pole outgoing ways	8, 12, 16, 18, 24 Triple pole way outgoing ways
Outgoing Protection	Type B MCB (6A to 63A, 1P & 3P) Type C, D MCB, (0.5A to 63A, 1P & 3P) 1Mod and 2Mod RCBO	Type B MCB (6A to 63A, 1P & 3P) Type C, D MCB, (0.5A to 63A, 1P & 3P) 1Mod and 2Mod RCBO
Voltage Rating in AC	230 / 415V	230 / 415V
IP Protection	IP3X to BS EN 60529	IP3X to BS EN 60529
Enclosure Body Type	Steel	Steel
Enclosure Paint Type	Powder Coat Grey White BS4800 00A01	Powder Coat Grey White BS4800 00A01
Cable Entry	Obround protected cable entry points	Obround protected cable entry points

Terminal Connection Capacity

Incoming Line Terminal	50mm ²	120mm ²
Incoming Earth Terminal	M8 stud	M8 stud
Incoming Neutral Terminal	50mm ² cage or M6 stud	M8 Stud
Outgoing Earth Terminals	16mm ²	16mm ²
Outgoing Neutral Terminals	16mm ²	16mm ²
Enclosure Earth Stud	M8	M8

Installation

Mounting	4 x key hole fixing holes plus central top key hole for one fixing hanging / levelling Surface Wall Mount	4 x key hole fixing holes plus central top key hole for one fixing hanging / levelling Surface Wall Mount
Gland Plate	Top and bottom removable	Top and bottom removable
Integrated Locking System	Coin lock as standard, key lock as accessory	Coin lock as standard, key lock as accessory

Interface Characteristics	Dual Power & Lighting Boards	Triple Power, Lighting & Services Board
Rated & operational voltage (U_N / U_e)	415V A.C. 50Hz	415V A.C. 50Hz
Rated insulation voltage (U_i)	690V A.C. 50Hz	690V A.C. 50Hz
Rated impulse withstand voltage (U_{imp})	4kV	4kV
Rated current of the Assembly (I_{NA})	125A	200A
Rated current of pan assembly	Lower Pan (I_N) = 125A (RDF=1) Upper Pan (I_N) = 125A (RDF=1)	Lower Pan (I_N) = 125A (RDF=1) Middle Pan (I_N) = 125A (RDF=1) Upper Pan (I_N) = 125A (RDF=1)
Rated current of an Outgoing Circuit (I_{NC})	MCB 0.5A - 63A (marked rated current on device) RCBO 6A - 45A (marked rated current on device)	MCB 0.5A - 63A (marked rated current on device) RCBO 6A - 45A (marked rated current on device)
Rated conditional short-circuit current of the assembly (I_{CC})	10kA with equipment and arrangements specified in Hager's technical documentation/catalogue	10kA ¹ with equipment and arrangements specified in Hager's technical documentation/catalogue
Protection against electric shock	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671
Rated Diversity Factor (RDF) / Values of assumed loading	10 way to 24 way = 0.5 Note: RDF only applies to continuously and simultaneously loaded circuits.	10 way to 24 way = 0.5 Note: RDF only applies to continuously and simultaneously loaded circuits.
Rated frequency (f_N)	50 Hz	50 Hz
Pollution degree	2	2
Types of system earthing for which the assembly is designed	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671
Intended locations	Indoor use only	Indoor use only
Stationary Assembly		
Degree of protection	IP3XD with Door Closed IP2XC with Door Open	IP3XD with Door Closed IP2XC with Door Open
Intended use	Distribution boards intended to be operated by ordinary persons (DBO)	Distribution boards intended to be operated by ordinary persons (DBO)
Electromagnetic compatibility (EMC) classification	EMC Environment B	EMC Environment B
External design	Wall-mounted, surface type, enclosed assembly.	Wall-mounted, surface type, enclosed assembly.
Mechanical impact protection	IK05	IK05
The type of construction	Fixed parts	Fixed parts
DBO Type	Type B DBO	Type B DBO
Incoming Line Terminal	70mm ² (switch disconnecter)	70mm ² (switch disconnecter)
Incoming Neutral Terminal	50mm ² Cage	50mm ² Cage
Enclosure Earth Stud	M8	M8
Standards	BS EN 61439-3	BS EN 61439-3

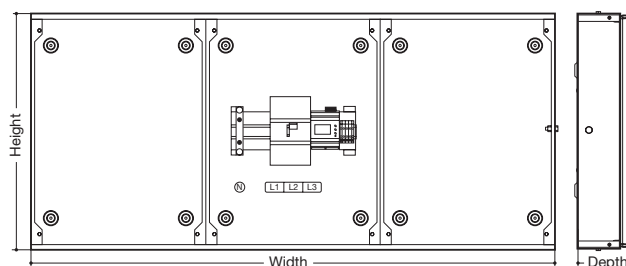
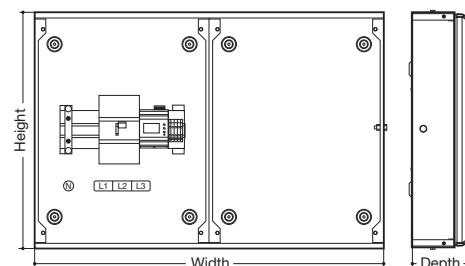
Interface Characteristics	JKD125MID	JKD125TMID	JKD250MID	JKD250TMID
Rated & operational voltage (U_N / U_E)	415V A.C. 50Hz	415V A.C. 50Hz	415V A.C. 50Hz	415V A.C. 50Hz
Rated insulation voltage (U_i)	690V A.C. 50Hz	690V A.C. 50Hz	690V A.C. 50Hz	690V A.C. 50Hz
Rated impulse withstand voltage (U_{imp})	4kV	4kV	4kV	4kV
Rated current of the Assembly (I_{nA})	125A Right Side Pan Assembly (I_n) 125A Left Side Pan Assembly (I_n) 125A	125A Right Side Pan Assembly (I_n) 125A Middle Pan Assembly (I_n) 125A Left Side Pan Assembly (I_n) 125A	250A Right Side Pan Assembly (I_n) 250A Left Side Pan Assembly (I_n) 250A	250A Right Side Pan Assembly (I_n) 200A Middle Pan Assembly (I_n) 200A Left Side Pan Assembly (I_n) 200A
Rated conditional short-circuit current of the assembly (I_{cc})	10kA with equipment and arrangements specified in Hager's technical documentation/catalogue	10kA with equipment and arrangements specified in Hager's technical documentation/catalogue	10kA with equipment and arrangements specified in Hager's technical documentation/catalogue	10kA with equipment and arrangements specified in Hager's technical documentation / catalogue
Protection against electric shock	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671	Equipment shall be installed in an electrical system conforming to IEC 60364 / BS 7671
Rated frequency (f_n)	50 Hz	50 Hz	50 Hz	50 Hz
Pollution degree	2	2	2	2
Types of system earthing for which the ASSEMBLY is designed	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671
Intended locations	Indoor use only	Indoor use only	Indoor use only	Indoor use only
Degree of protection	IP3XD with Door Closed IP2XC with Door Open	IP3XD with Door Closed IP2XC with Door Open	IP3XD with Door Closed IP2XC with Door Open	IP3XD with Door Closed / IP2XC with Door Open
Intended use	Distribution boards intended to be operated by ordinary persons (DBO)	Distribution boards intended to be operated by ordinary persons (DBO)	Distribution boards intended to be operated by ordinary persons (DBO)	Distribution boards intended to be operated by ordinary persons (DBO)
Electromagnetic compatibility (EMC) classification	EMC Environment B	EMC Environment B	EMC Environment B	EMC Environment B
External design	Wall-mounted, surface type, enclosed assembly.	Wall-mounted, surface type, enclosed assembly.	Wall-mounted, surface type, enclosed assembly.	Wall-mounted, surface type, enclosed assembly.
Mechanical impact protection	IK05	IK05	IK05	IK05
The type of construction	Fixed parts	Fixed parts	Fixed parts	Fixed parts
Incoming Line Terminal	M8	M8	M8	M8
Incoming Neutral Terminal	M8 Lug	M8 Lug	M8 Lug	M8 Lug
Enclosure Earth Stud	M8	M8	M8	M8

Meter Characteristics

Supply	60 to 300V AC, 50/60Hz (±5%)
Serial Communication	
Interface Standard and Protocol	RS485 and MODBUS RTU
Input (CT)	
Pluggable RJ45	Input 1/ Input 2
Output	
Pulse Output:	Voltage Range : 24V DC max
Current Capacity :	100mA max
Pulse Duration :	Selectable Between 0.1 to 2.0sec
Pulse Weight :	Selectable between 0.01 to 9.99kWh
Accuracy of meter	
Measurement	Accuracy
Voltage VL-N	0.5% of full range
Voltage VL-L	0.5% of full range
Current A	0.5% of full range
Frequency For L-N Voltage >20V For L-L Voltage >35V"	0.1% of full range
Active power	1.0% of full range
Apparent Power	1.0% of full range
Reactive Power	1.0% of full range
Power Factor	±0.01% of full Range
Active Energy	1.0% of full range
Reactive Energy	1.0% of full range
Max/Min Active Power	1.0% of full range
Max/Min Reactive Power	1.0% of full range
Max Apparent Power	1.0% of full range
Power Consumption	Less than 8VA

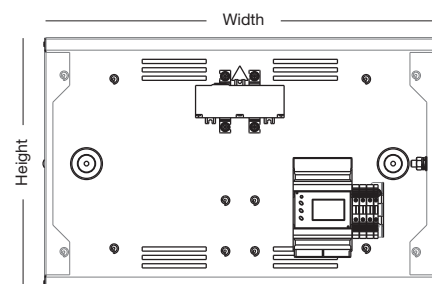
Dual & Triple Meter Incomers

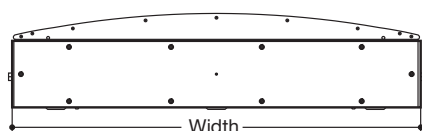
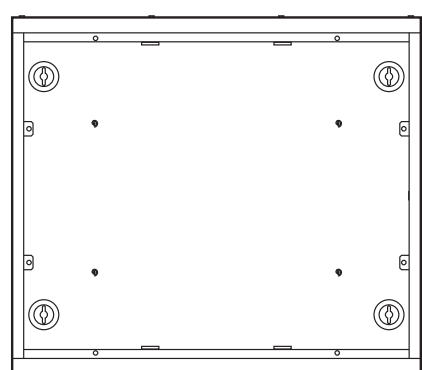
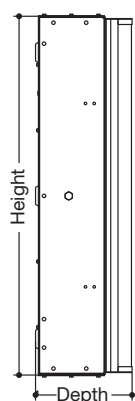
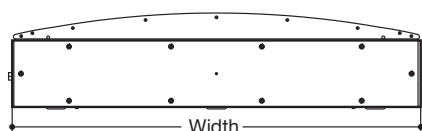
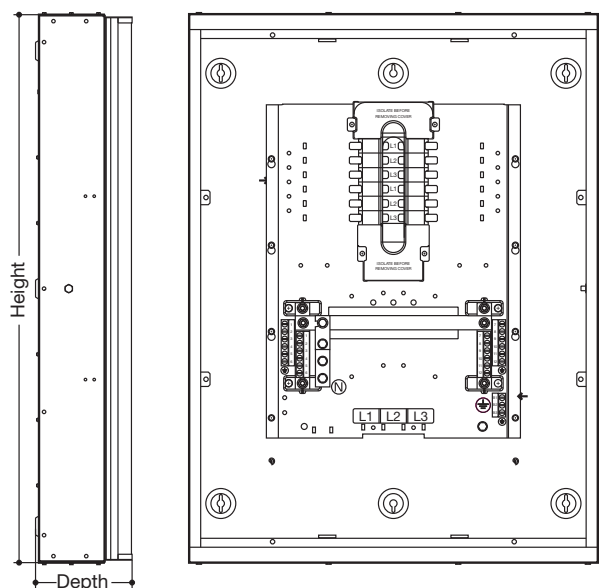
	Dimensions (mm)		
	Height	Width	Depth
JKD125MID	450	930	132.5
JKD125TMID	450	1395	132.5
JKD250MID	625	930	165.5
JKD250TMID	625	1395	165.5



TP&N Board Meter Enclosures

JKD1125MID	300	465	132.5
JKD2250MID	300	465	165.5





Extension Boxes

	Dimensions (mm)		
	Height	Width	Depth
JN201BE/G	300	710	160
JN203BE/G	450	710	160
JN205BE	300	710	130
JN206BE	450	710	130

Primary Boards

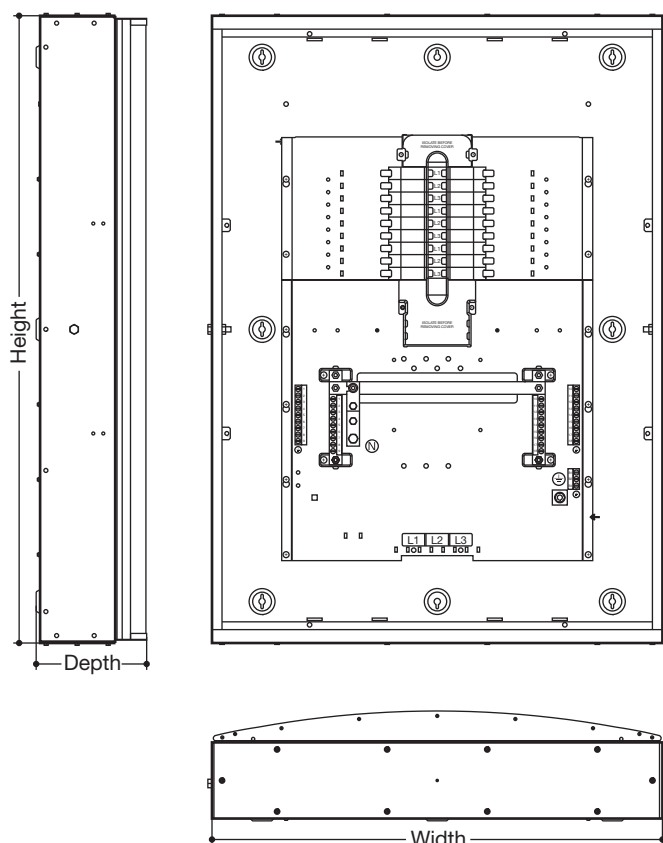
	Dimensions (mm)			Spare Door Cat Refs
	Height	Width	Depth	
JN204B/G	950	710	160	JN204BG/D
JN206B/G	1100	710	160	JN206BG/D
JN208B/G	1100	710	160	JN208BG/D
JN212B/G	1250	710	160	JN212BG/D
JN216B/G	1550	710	160	JN216BG/D

Terminals

Neutral	Earth	Bond
2 x 6 x 50mm	2 x 6 x 50mm	1 x 3 x 50mm
2 x 9 x 50mm	2 x 9 x 50mm	1 x 3 x 50mm
2 x 12 x 50mm	2 x 12 x 50mm	1 x 3 x 50mm
2 x 18 x 50mm	2 x 18 x 50mm	1 x 3 x 50mm
2 x 24 x 50mm	2 x 24 x 50mm	1 x 3 x 50mm

Cables outgoing ways:
 25 - 50mm² CSA Flex
 25 - 70mm² CSA Solid

MCCB Connections	M8
Earth	M8
Neutral	M8



Primary Boards

	Dimensions (mm)			Spare Door Cat Refs
	Height	Width	Depth	
JF406B/G	1250	900	220	JF812BG/D
JF408B/G	1250	900	220	JF812BG/D
JF412B/G	1400	900	220	JF814BG/D
JF416B/G	1550	900	220	JF815BG/D
JF418B/G	1700	900	220	JF817BG/D
JF808B/G	1250	900	220	JF812BG/D
JF812B/G	1400	900	220	JF814BG/D
JF818B/G	1700	900	220	JF817BG/D
JF60204B/G	1250	900	220	JF812BG/D
JF80206B/G	1250	900	220	JF812BG/D
JF80404B/G	1250	900	220	JF812BG/D
JF80210B/G	1400	900	220	JF814BG/D
JF80408B/G	1400	900	220	JF814BG/D
JF80414B/G	1700	900	220	JF817BG/D
JF80612B/G	1700	900	220	JF817BG/D

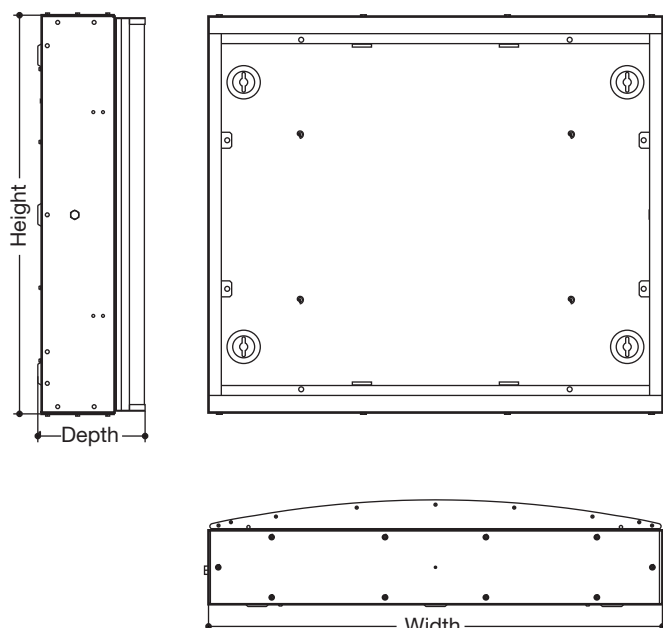
Terminals

Neutral		Earth	Bond
2 x 9 x 50mm		2 x 9 x 50mm	1 x 3 x 50
2 x 12 x 50mm		2 x 12 x 50mm	1 x 3 x 50
2 x 18 x 50mm		2 x 18 x 50mm	1 x 3 x 50
2 x 24 x 50mm		2 x 24 x 50mm	1 x 3 x 50
2 x 12 x 50mm		2 x 12 x 50mm	1 x 3 x 50
2 x 18 x 50mm		2 x 18 x 50mm	1 x 3 x 50
2 x 27 x 50mm		2 x 27 x 50mm	1 x 3 x 50
2 x 6 x 50mm	2 x M8 Bolt	2 x 9 x 50mm	1 x 3 x 50
2 x 9 x 50mm	2 x M8 Bolt	2 x 12 x 50mm	1 x 3 x 50
2 x 6 x 50mm	4 x M8 Bolt	2 x 12 x 50mm	1 x 3 x 50
2 x 15 x 50mm	2 x M8 Bolt	2 x 18 x 50mm	1 x 3 x 50
2 x 12 x 50mm	4 x M8 Bolt	2 x 18 x 50mm	1 x 3 x 50
2 x 21 x 50mm	4 x M8 Bolt	2 x 27 x 50mm	1 x 3 x 50
2 x 18 x 50mm	6 x M8 Bolt	2 x 27 x 50mm	1 x 3 x 50

Cables outgoing ways:
25 - 50mm² CSA Flex
25 - 70mm² CSA Solid

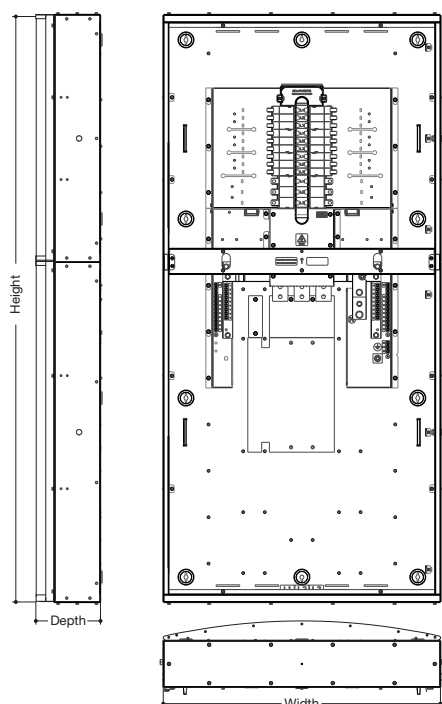
MCCB Connections:
400A M10
630A M12

Earth:
400A M10
630A M10



Extension Boxes

	Dimensions (mm)		
	Height	Width	Depth
JF801E/G	300	900	220
JF803E/G	450	900	220
JF805E	300	900	158
JF806E	450	900	158



Primary Boards

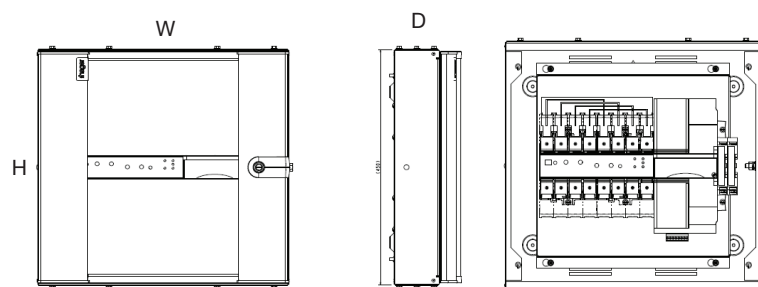
	Dimensions (mm)		
	Height	Width	Depth
JHF812B/G	2050	900	220
JHF818B/G	2200	900	220
JHF80206B/G	1900	900	220
JHF80404B/G	1900	900	220
JHF80210B/G	2050	900	220
JHF80408B/G	2050	900	220
JHF80414B/G	2200	900	220
JHF80612B/G	2200	900	220

Invicta 3 Panelboard Metering Example

Example below: 250A, 6 way panelboard, requiring 4 outgoing meters (not including incomers & outgoers).

Step	Selection method	Order code	Quantity
1	Select panelboard eg. 6 way with glazed door	JN206BG	1
2	Identify quantity of meters required eg. 4 metered ways modbus (If MID required, use HGR96EWC)	ECM01	4
3	Select position for meter enclosure (Top or side) eg. Side - 6/8 Way JN Board 4xDIN 96 Cut-Outs (If top mount required, use JN4506TM)	JN11004SM	1
4	Number of blanking plates required eg. Side - 6/8 Way JN Board 4xDIN 96 Cut-Outs	JF96BP	2
5	Meter voltage supply cable.	JN130VMF	1
6	Supply cable for remaining meters (Link meter to meter)	PGMFT150	3
7	Identify which CT's are required eg. 100 Amp	EC12100CT	4

Characteristics	250A	400A	630 / 800A	800A
Series	JN2**	JF4**	JF6**/JF8**	JHF8**
Busbar current rating	250A	400A	800A	800A (for 800A MCCB only)
Busbar type	Type B Fully Shrouded Copper			
Busbar rated short-time with-stand current	25kA for 1 sec	35kA for 1 sec	35kA for 1 sec	35kA for 1 sec
Internal separation	Form 3A			
Incoming	Up to 250A MCCB, MCS	Up to 400A MCCB, MCS	Up to 630A MCCB, 800A LBS	800A MCCB
Outgoing	16 - 125A max.	16 - 125A max.	16 - 125A 100A - 250A	16 - 125A 100A - 250A
Voltage rating in A.C.	415V	415V	415V	415V
IP Protection	IP30			
Enclosure body type	Steel			
Enclosure paint type	Powder coat Grey White BS 4800 00A01			
Cable entry	Via Gland Plates			
Terminal Connection capacity				
Incoming earth terminal	M8	M10	M10	M10
Incoming neutral terminal	M8	M12	M12	M12
Outgoing earth terminals	Up to 50mm²	Up to 50mm²	Up to 50mm²	Up to 50mm²
Outgoing neutral terminals	Up to 50mm²	Up to 50mm²	16A - 125A: Up to 50mm² 100A - 250A: M8 Stud	16A - 125A: Up to 50mm² 100A - 250A: M8 Stud
Enclosure earth stud	M8	M10	M10	M10
Installation				
Mounting	Surface (Wall)			



Enclosed ATS

	Dimensions (mm)			
	Width	Height	Depth	Weight
JK140ATS	465	450	132.5	10.5
JK163ATS	465	450	132.5	10.5
JK180ATS	465	450	132.5	10.5
JK100ATS	465	450	132.5	10.5
JK125ATS	465	450	132.5	10.5

Corner Filler Enclosures

	Dimensions (mm)			
	Width	Height	Depth	Number of cutouts
JF				
JF300CF	350	300	160	-
JF450CF	350	450	160	-

JN

	Width	Height	Depth	Number of cutouts
JN300CF	300	710	160	-
JN450CF	450	710	160	-

Top/Bottom Enclosures

	Dimensions (mm)			
	Width	Height	Depth	Number of cutouts
JF				
JF3004TM	900	300	160	4
JF4508TM	900	450	160	8

JN

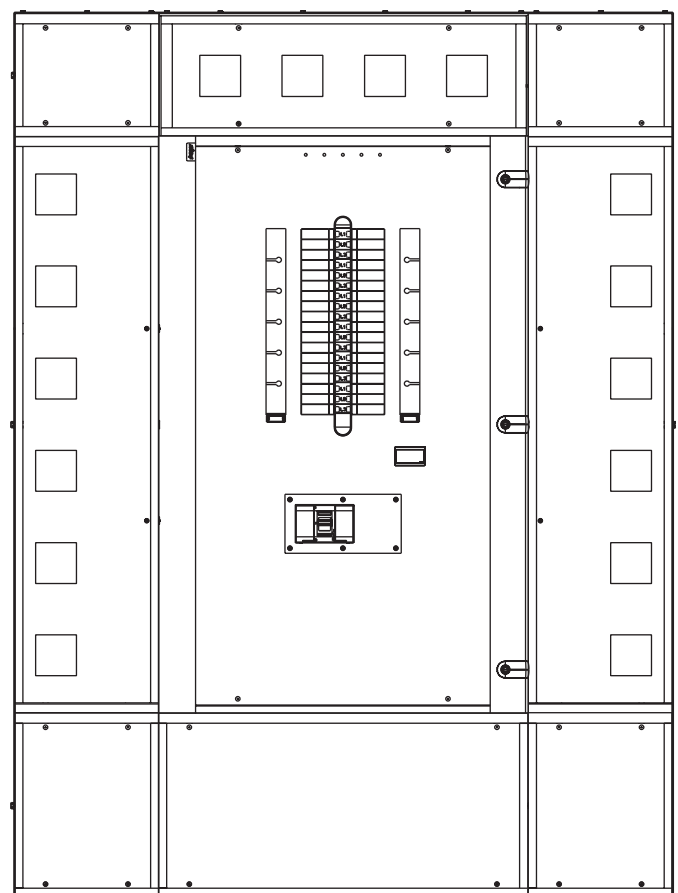
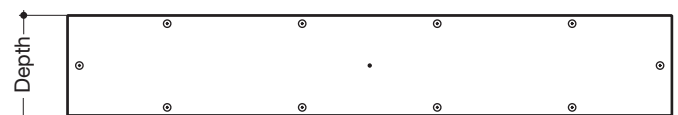
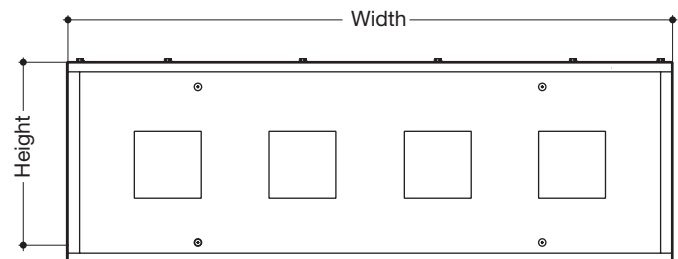
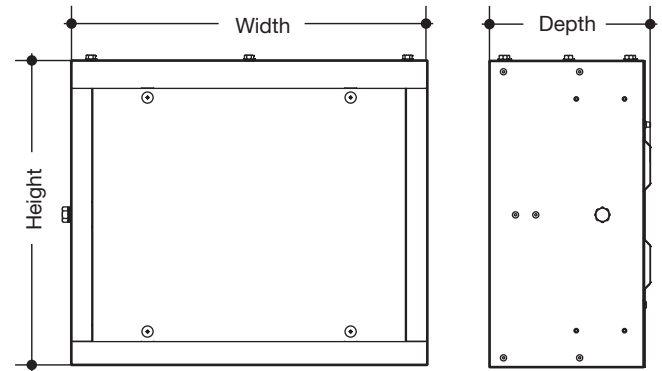
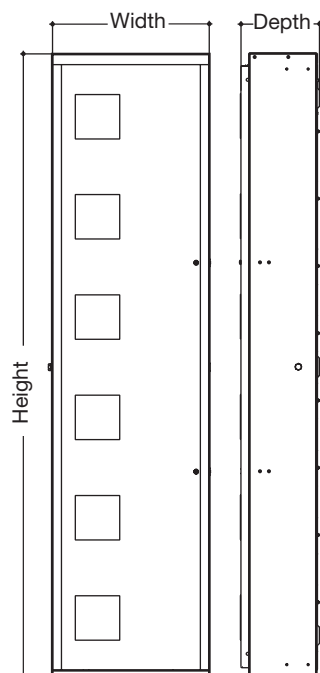
	Width	Height	Depth	Number of cutouts
JN3003TM	710	300	130	3
JN4506TM	710	450	130	6

Side Enclosures

	Dimensions (mm)			
	Width	Height	Depth	Number of cutouts
JF				
JF12504SM	350	1250	160	4
JF14006SM	350	1400	160	6
JF15508SM	350	1550	160	8
JF17009SM	350	1700	160	9

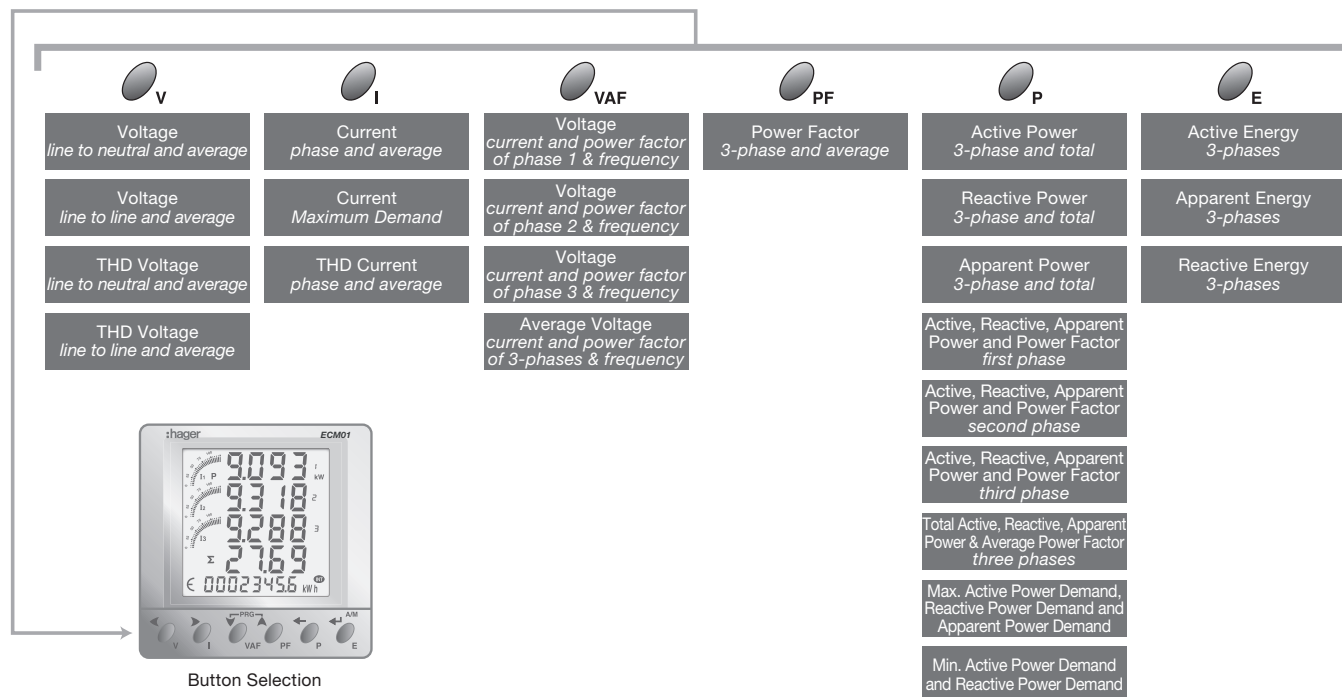
JN

	Width	Height	Depth	Number of cutouts
JN9502SM	350	950	143	2
JN11004SM	350	1100	143	4
JN12506SM	350	1250	143	6
JN15508SM	350	1550	143	8

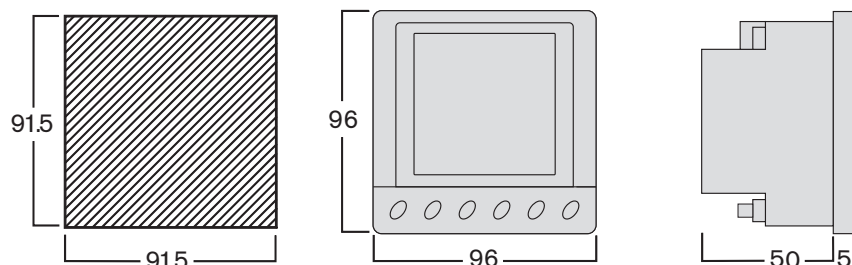


- 96 x 96mm Flush mounting
- Single phase or 3 phase (4 wire) network balanced or unbalanced load
- Built in energy pulsed output or with pulsed output and RS485 (modbus)
- Backlit LCD display with bargraph current indication on every page
- Automatic or manual scrolling display
- 330mV current transformer input
- Active energy class 1 (EN62053-21)
- Reactive energy class 2 (EN62053-23)
- Programmable VT ratio
- 3-phase: 140...460Vac measured voltage
- Single phase: 80...265Vac measured voltage
- THD up to 31st harmonic for voltage and current
- Self supplied auxiliary
- Programmable CT ratio 5 to 10,000A
- Frequency 45/65Hz
- Wide range of measured parameters (see table below)
- Selectable CT phase correction allows reversal of L1 and L3
- Weight 230g

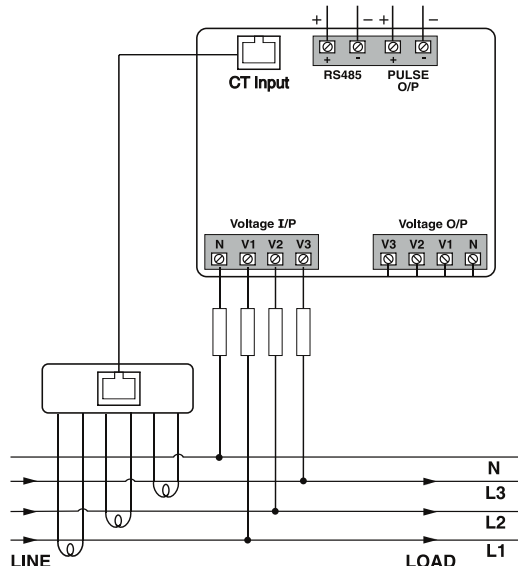
Function Diagram



Dimensions Diagram (mm)

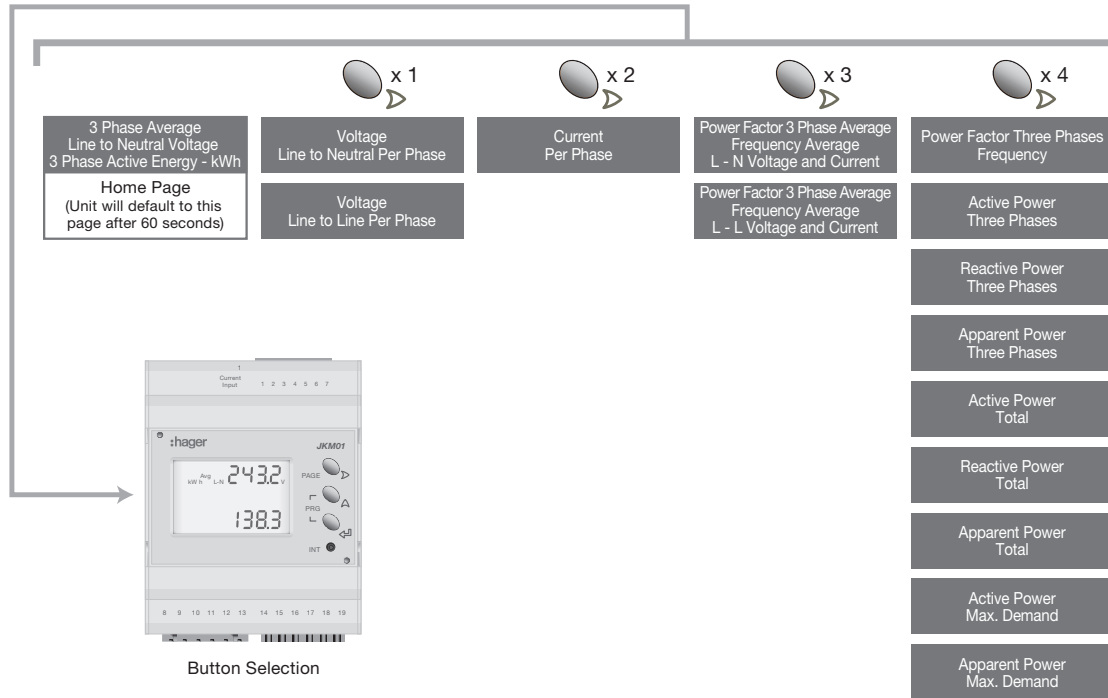


Please allow space at the rear of the meter for cable connections.

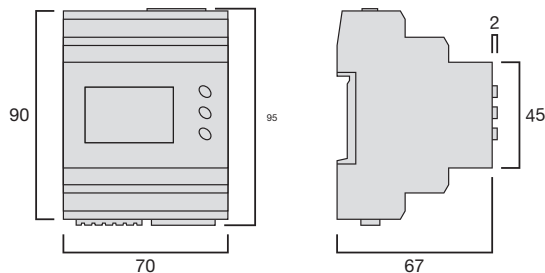


- 4 Module DIN rail mounting
- Single phase or 3 phase (4 wire) network balanced or unbalanced load
- Built-in energy pulse output and RS485 MODBUS communication
- Wide range of measured parameters (see table below)
- High quality backlit LCD display
- 330mV current transformer input
- Active energy class 1 (EN62053-21)
- Reactive energy class 2 (EN62053-23)
- THD up to 31st harmonic for voltage and current
- 3-phase: 140...460Vac measured voltage
- Single phase: 80...265Vac measured voltage
- Self supplied auxiliary
- Programmable CT ratio 5...10,000A
- Programmable VT ratio
- Frequency 45/65Hz
- Selectable CT phase correction allows reversal of L1 and L3
- Weight 190g

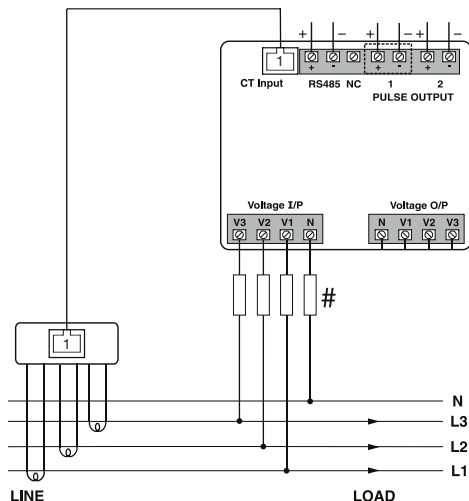
Function Diagram



Dimension Diagrams (mm)



Please allow space above and below the meter for cable connections.



Description

Designed for use with Hager x160 MCCBs and the plug-in multifunction power meters.

Internal safety circuitry is provided which limits the output voltage to a safe level, allowing the transformer secondary to be left disconnected under load.

Installation

The CT uses plug-in technology allowing much faster installation, saving you time and money. Additionally, all our three phase current transformers have been designed with hole centres and apertures to fit most standard industrial circuit breakers.

	EC1260CT, EC12100CT, EC12125CT, EC12160CT	EC2560CT, EC25100CT, EC2512CT, EC25160CT, EC25200CT, EC25250CT	EC40250CT, EC40400CT, EC40630CT	EC80800CT
Accuracy Class	1	1	1	1
Aperture	3 @ 15.5 x 30mm	3 @ 21 x 25mm	3 @ 31 x 31mm	3 @ 54 x 50mm
Width	75mm	105mm	140mm	215mm
Primary Current	60 to 160A	60 to 250A	250 to 630A	800A
Hole Centres	25mm	35mm	45mm	70mm
Housing Material	Self extinguishing Nylon IEC185 classification VO according to UL-94			
Reference Standard	EN6004-8			
Weight	500g	550g	680g	1200g

EC1260CT, EC12100CT, EC12125CT, EC12160CT

Current Transformer Ratios

Primary Current	Output	
60	330	060
100	330	100
125	330	125
160	330	160

330mV Secondary

EC2560CT, EC25100CT, EC2512CT, EC25160CT, EC25200CT, EC25250CT

Current Transformer Ratios

Primary Current	Output	
60	330	060
100	330	100
125	330	125
160	330	160
200	330	200
250	330	250

330mV Secondary

EC40250CT, EC40400CT, EC40630CT

Current Transformer Ratios

Primary Current	Output	
250	330	250
400	330	400
630	330	630

330mV Secondary

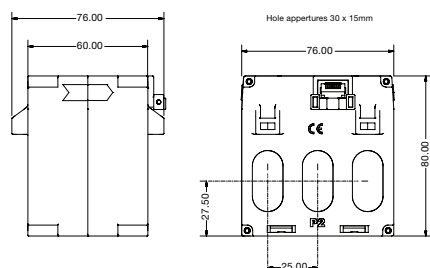
EC80800CT

Current Transformer Ratios

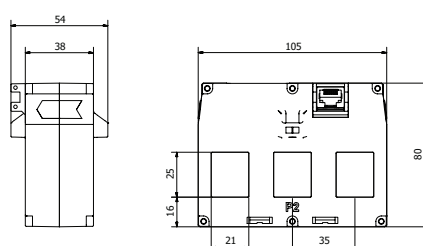
Primary Current	Output	Code
A	mV	
800	330	800

330mV Secondary

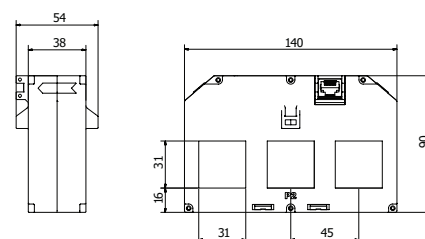
EC1260CT, EC12100CT, EC12125CT, EC12160CT



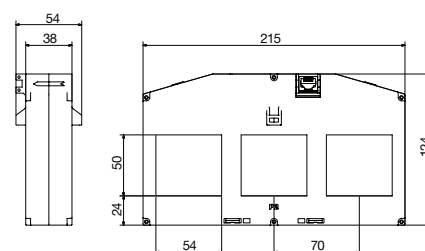
EC2560CT, EC25100CT, EC2512CT, EC25160CT, EC25200CT, EC25250CT



EC40250CT, EC40400CT, EC40630CT



EC80800CT



Fuse Combination Switches

All dimensions are in mm and exclude the handle.
Add 45mm to the depth to allow for the handle (110mm for 630 / 800A)

SPSN	Description	Dimensions (mm)		
		Width	Height	Depth
JFB202U	20A SPSN	200	250	150
JFB203U	32A SPSN	200	250	150
JFD206U	63A SPSN	300	325	150
JFE210U	100A SPSN	375	400	200

TPN	Description	Dimensions (mm)		
		Width	Height	Depth
JFB302U	20A TPN	200	250	150
JFB303U	32A TPN	200	250	150
JFD306U	63A TPN	300	325	150
JFE310U	100A TPN	375	400	200
JFG312U	125A TPN	375	500	200
JFG316U	160A TPN	375	500	200
JFG320U	200A TPN	375	500	200
JFG325U	250A TPN	375	500	200
JFH331U	315A TPN	500	650	300
JFH340U	400A TPN	500	650	300
JFI363U	630A TPN	600	800	350
JFI380U	800A TPN	600	800	350

TPSN	Description	Dimensions (mm)		
		Width	Height	Depth
JFB402U	20A TPSN	200	250	150
JFB403U	32A TPSN	200	250	150
JFD406U	63A TPSN	300	325	150
JFE410U	100A TPSN	375	400	200
JFG412U	125A TPSN	375	500	200
JFG416U	160A TPSN	375	500	200
JFG420U	200A TPSN	375	500	200
JFG425U	250A TPSN	375	500	200
JFH431U	315A TPSN	500	650	300
JFH440U	400A TPSN	500	650	300
JFI463U	630A TPSN	600	800	350
JFI480U	800A TPSN	600	800	350

Cable Extension Boxes

	Dimensions (mm)		
	Width	Height	Depth
JZA700	250	200	150
JZA701	375	200	200
JZA702	500	250	300
JZA703	600	300	350

Switch Disconnectors

All dimensions are in mm and exclude the handle.

3 Pole	Description	Dimensions (mm)			
		Width	Height	Depth	Handle Depth
JAC316	160A TPN	250	300	150	190
JAE320	200A TPN	375	400	200	240
JAE325	250A TPN	375	400	200	240
JAG331	315A TPN	375	500	200	240
JAG340	400A TPN	375	500	200	240
JAH363	630A TPN	500	650	300	340
JAH380	800A TPN	500	650	300	340

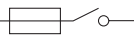
4 Pole	Description	Dimensions (mm)			
		Width	Height	Depth	Handle Depth
JAB402B	20A TPSN	175	232	65	78
JAB403B	32A TPSN	175	232	65	78
JAB406B	63A TPSN	175	232	65	81
JAB410B	100A TPSN	200	300	80	97
JAC412B	125A TPSN	200	300	80	97
JAC416	160A TPSN	250	300	150	190
JAE420	200A TPSN	375	400	200	240
JAE425	250A TPSN	375	400	200	240
JAG431	315A TPSN	375	500	200	240
JAG440	400A TPSN	375	500	200	240
JAH463	630A TPSN	500	650	300	340
JAH480	800A TPSN	500	650	300	340

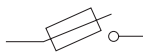
Thermal current I_{th} (40°C)	20A	32A	63A	100A	125A	160A	200A
Fuse size: BS	A1	A1	A2-A3	A4	B1-B2	B1-B2	B1-B2
Rated insulated voltage							
Ui (V)	800	800	800	800	800	800	800
Impulse voltages Uimp (V)	8000 8000	8000 8000	8000 8000	8000 8000	8000 8000	12000 12000	8000 8000
Operational current I_e (A) A = Frequent operation B = Infrequent operation	A B	A B	A B	A B	A B	A B	A B
415V ac AC-22A/AC-23B	20 20	32 32	63 63	100 100	125 125	160 160	200 200
Motor power (kW) 400V ac	9	15	30	51	63	80	100
Reactive power 400V ac (kVAr)	15	45	25	45	55	60	75
Overload capacity							
Short-circuit with fuses (kA RMS)	50	50	50	50	50	50	50
Fuse rating (A) BS 88	20	32	63	100	125	160	200
Making & Breaking Capacity							
Breaking capacity 400V AC-23B (A RMS)	160	256	500	800	1000	1280	1600
Making capacity 400V AC-22 (A RMS)	200	320	630	1000	1250	1600	2000
Withstand mechanical (number of operations)	20,000	20,000	10,000	10,000	10,000	10,000	10,000
Minimum tightening torque (Nm)	2	2	2.5	8.3	8.3	8.3	20
Connection (mm²)							
Minimum Cu cable section	2.5	2.5	10	25	50	50	95
Maximum Cu cable section	16	16	25	95	95	95	240
Maximum terminal lug selection	-	-	-	M8	M8	M8	M10
Fuse types	NIT20	NIT32	BA063	CEO100	DD125	DD160	DD200

Thermal current I_{th} (40°C)	250A	315A	400A	630A	800A
Fuse size: BS	B1-B3	B1-B3	B1-B4	C1-C2	C1-C3
Rated insulated voltage Uimp (V)	8000 8000	8000 8000	8000 8000	12000 12000	12000 12000
Operational current I_e (A) A = Frequent operation B = Infrequent operation	A B	A B	A B	A B	A B
415V A.C. AC-22A/AC-23B	250 250	315 315	400 400	630 630	800 800
Motor power (kW) 400V A.C.	-	160 160	220 220	355 355	-
Reactive power 400V A.C. (kVAR)	-	125	150	2 x 125	-
Overload capacity					
Short-circuit with fuses (kA Rms)	50	50	50	50	50
Fuse rating (A) BS 88	250	315	400	630	800
Making & Breaking Capacity					
Breaking capacity 400V AC-23B (A R.M.S)	2000	2520	3200	-	-
Making capacity 400V AC-23B (A R.M.S)	2500	3150	4000	-	-
Withstand mechanical (number of operations)	10,000	10,000	10,000	8000	8000
Minimum tightening torque (Nm)	20	20	20	40	40
Connection (mm²)					
Minimum Cu cable section	95	185	185	2 x 150	2 x 185
Maximum Cu cable section	240	240	240	3 x 300	3 x 300
Maximum terminal lug selection	M10	M10	M10	M12	M12
Fuse types	ED250	ED315	ED400	FF630	GF800

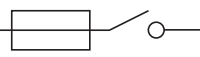
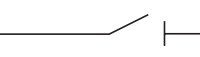
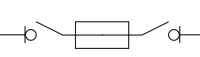
Fuse - Combination Units - BS EN 60947-3

Many people are attracted to fuse-combination units by their simplicity in application and their reliability in operation. They are particularly useful for use on very high prospective fault level systems where the high energy limiting characteristic of the HRC fuse can be effectively utilised. In the past fuse-combination units came in two forms:

Switch Fuse  A switch in which one or more poles have a fuse in series.

Fuse Switch  A switch in which one or more poles have a fuse carrier/link which forms the moving contact.

The definitions of these two basic types of fuse combination units have now been extended to include units suitable for making, breaking and isolation and units which are only suitable for providing isolation for maintenance work.

Definition	Symbol	Function
Switch Fuse		Making and breaking current
Disconnecter Fuse		Isolating
Switch Disconnecter Fuse		Making, breaking and isolating
Fuse Switch		Making and breaking current
Fuse Disconnecter		Isolating
Fuse Switch Disconnecter		Making, breaking and isolating

However, in order to keep the selection of fuse-combination units as simple as possible, Hager offer a range of high performance double break switch-fuses, which also satisfy the isolating requirement of the British standard. These are correctly shown as and defined as a Fuse Combination Switch.

Switch disconnectors - BS EN 60947-3. A range of switch disconnectors (isolators) are available for use on lower current ratings from 20A to 125A. These switches are rated at AC-22 and provide a cost effective alternative to the fuse combination switch, especially where the utilisation category AC-23 is not required. ie; mixed resistive and inductive loads.

Utilisation categories

Utilisation categories are not new but they are important because they help the designer or specifier identify the correct unit for a particular application.

The designation of the utilisation category is made up of three parts:

1. The prefix AC or DC, which indicates the nature of the current.
2. The two digit number, which indicates the type of application the unit is suitable for:
 - 20 Connecting and disconnecting under no-load.
 - 21 Switching of resistive loads.
 - 22 Switching of mixed resistive and inductive loads.
 - 23 Switching of highly inductive loads.
3. The suffix A or B, which indicates whether the unit is suitable for frequent or infrequent operation.
 - A Frequent operation
 - B Infrequent operation.

For example a fuse-combination unit feeding a 400V AC circuit of mixed resistive and inductive loads which would need to be operated frequently would require a minimum utilisation category of AC-22A.

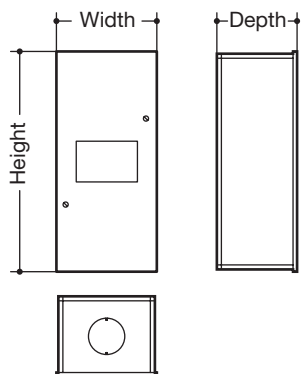
If the load was highly inductive, i.e. motor loads, then the minimum utilisation category would be AC-23A.

Generally, category AC-23 does not cover the switching of capacitors. Usually this is the subject of agreement between manufacturer and user.

Motor Power Circuit Protection

Fuse-combination units can be used very effectively for motor power circuit protection, the energy limiting HRC fuse offering very good protection to its associated starter. Category AC-23A should be specified for this duty. Special motor circuit protection fuse links are available which eliminate the need to fit a larger bodied fuse just to take care of the starting current of the motor.

The protection of motor power circuits should not be confused with the direct switching of a single motor. If a fuse-combination unit is required to perform this function then it must comply with the requirements of Appendix A of BS EN 60947-3 which makes provision for different utilisation categories for this application.



Switch Fuses

	Dimensions (mm)				
	Width	Height	Depth	Depth with Door	Knockouts
IU44-16	115	187	61.5	-	2 x 25mm
IU44-18	125	312	73.5	-	None
IU44-11	125	312	73.5	-	None
IU44-16-D	125	312	74	96	None
IU44-18-D	125	312	74	96	None
IU44-11-D	125	312	74	96	None

IP65 Enclosed Isolating Switch

All dimensions are in mm and exclude the handle.

Add 27mm to the depth to allow for the handle on 10-25A products.

Add 32mm to the depth to allow for the handle on 40-80A products.

Description	Dimensions (mm)		
	Width	Height	Depth
JG00S 10A TPN	100	136	74
JG01S 16A TPN	100	136	105
JG02S 25A TPN	100	136	105
JG03S 40A TPN	136	201	105
JG04S 63A TPN	136	201	118
JG05S 80A TPN	136	201	118

Enclosed thermal current I_{the}	16	25	40	63	80
Rated insulation voltage U_i (V)	690	690	690	690	690
Rated thermal current I_{the} (A)	25	40	63	80	100
Rated operational current					
AC21 400V I_e (A)	25	40	63	80	100
AC22 400V	16	25	40	63	100
AC22 400V $\cos \phi$ 0.65	16	20	32	63	100
AC23 400V	16	20	32	63	100
AC23 400V $\cos \phi$ 0.35	16	15	25	40	63
Rated operational power					
AC23 230V (kW)	4	5.5	7.5	11	15
AC23 400V	7.5	11	15	22	30
Rated fused short circuit current					
Back-up fuse (A)	63	63	63	80	100
R.M.S value I_k (kA)	50	50	50	50	50
Peak value (kA)	5.4	6.6	7.2	8.3	8.7
Rated short circuit making capacity (I_{cm}) (kA) 690V	2.5	2.5	2.5	3.3	3.3
Rated short time withstand current (I_{cw}) (kA) 690V (1s)	1	1.1	1.6	1.7	2.3
Rated breaking capacity I_{cn} (A) AC23					
400V $\cos \phi$ 0.35	250	270	320	480	504
Electrical endurance (number of operations)	3000	3000	3000	3000	-
Mechanical endurance (number of operations)	50,000	50,000	50,000	50,000	-
Terminals mm^2	1.5 - 16	1.5 - 16	1.5 - 16	2.5 - 35	2.3 - 35
Max. thermal torque (Nm)	1.8	1.8	1.8	2.5	2.5

Enclosed thermal current I_{the}	20	32	63	100	125	160	200	250	315	400	630	800
Rated insulation voltage U_i (V)	800	800	800	800	800	800	800	800	800	800	1000	1000
Rated thermal current I_{the} (A)	20	32	63	100	125	160	200	250	315	400	630	800
Rated operational current												
AC21A 500VAC	20	32	63	100	125	160	160	250	250	250	630	800
AC22A 500VAC	20	32	63	100	125	125	125	250	250	250	500	800
AC21A 690VAC	20	32	63	100	125	125	160	160	200	200	500	800
AC22A 690VAC	20	32	40	100	125	125	160	160	125	125	315	800
Overload capacity												
l _{cw} rated short time withstand value (kA)	1.26	1.26	1.5	2.75	7	7	9	9	9	9	13	35
R.M.S value (kA)	0.16	0.256	0.504	0.64	1	1.28	1.28	2	2	2	5.04	6.4
Peak withstand value (kA)	1.77	1.77	2.12	3.90	9.87	9.87	12.69	12.69	23.00	23.00	45.00	55.00
Rated short circuit making capacity (kA)	1.8	1.8	2.1	3.9	11.9	11.9	15.3	15.3	15.3	15.3	26	73.5
Rated impulse withstand voltage U_{imp} (kV)	8	8	8	8	8	8	8	8	8	8	12	12
Mechanical endurance (number of operations)	20,000	20,000	20,000	15,000	10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000
Maximum cable size	16	16	35	70	50	95	95	150	185	240	2 x 300	2 x 300
Tightening torque (Nm)	0.8	0.8	1.0	1.4	20	20	20	20	20	20	20	-

Product Reference	JAB402B	JAB403B	JAB406B	JAB410B	JAC412B
Thermal Current In	20A	32A	63A	100A	125A
Switch	3PSN	3PSN	3PSN	3PSN	3PSN
Rated Insulation Voltage U_i	800V	800V	800V	800V	800V
Rated Impulse Voltage U_{imp}	8kV	8kV	8kV	8kV	8kV

Dimensions

Height (mm)	232	232	232	232	300
Width (mm)	175	175	175	175	200
Depth (mm)	81	81	81	81	83

Operational Current I_e (A)

415V AC - AC21A / AC21B	20/20	32/32	63/63	100/100	125/125
415V AC - AC22A / AC22B	20/20	32/32	63/63	100/100	125/125
415V AC - AC23A / AC23B	20/20	32/32	63/63	100/100	125/125
500V AC - AC21A / AC21B	20/20	32/32	63/63	100/100	125/125
500V AC - AC22A / AC22B	20/20	32/32	63/63	100/100	125/125
500V AC - AC23A / AC23B	20/20	25/25	63/63	80/80	100/100
690V AC - AC21A / AC21B	20/20	32/32	63/63	100/100	125/125
690V AC - AC22A / AC22B	20/20	32/32	40/63	80/100	100/126
690V AC - AC23A / AC23B	20/20	25/25	40/40	63/63	63/63

Operational Power in AC-23 (kW)

At 415V AC	9	15	30	45	55
At 500V AC	9	15	30	45	55
At 690V AC	11	15	30	45	55

Overload Capacity

Fuse rating	20	32	63	100	125
Fused I _{cc}	50	50	50	25	25
I_{cw} (kA)	2.5 / 0.3s	2.5 / 0.3s	3.0 / 0.3s	5.0 / 0.3s	5.0 / 0.3s
I_{pk} (kA)	6	6	9	12	12

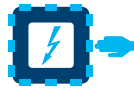
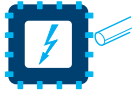
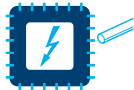
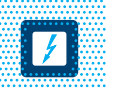
Cable Connection

Max Cu cable CSA mm ²	16	16	35	70	70
----------------------------------	----	----	----	----	----

The IP rating for all low voltage enclosures up to 1000 V A.C. and 1500 V D.C. is defined in identical fashion by the standards EN 60529 - IEC 529. It comprises the letters IP followed by two character numerals and or additional/ supplementary letters.

The first character numeral indicates the degree of protection provided by the enclosure against access to hazardous parts by preventing or limiting the ingress of a part of the human body or an object held by a person and ingress of solid foreign objects.

The first character numeral:
Protection against foreign objects

IP	Description	
0		Non-protected
1		Protected against solid objects $\geq$ than 50mm
2		Protected against solid objects $\geq$ than 12.5mm
3		Protected against solid objects $\geq$ than 2.5mm
4		Protected against solid objects $\geq$ than 1.0mm
5		Dust-protected
6		Dust-tight

Additional letter (optional)
Protection of people against access to hazardous parts

	Description
A	Protected against access to hazardous parts with the back of the hand
B	Protected against access to hazardous parts with a finger
C	Protected against access to hazardous parts with a tool - $\varnothing$ 2.5mm
D	Protected against access to hazardous parts with a tool - $\varnothing$ 1mm

The second character numeral indicates the degree of protection provided by the enclosure with respect to harmful effects on the equipment due to the ingress of water. An X signifies that the tests are not applicable to the product.

The second character numeral:
Protection against ingress of water with harmful effects

IP	Description	
0		Non-protected
1		Protected against dripping water
2		Protected against dripping water when tilted up to 15°
3		Protected against spraying water
4		Protected against splashing water
5		Protected against jetting
6		Protected against powerful jetting
7		Protected against the effect of temporary immersion
8		Protected against continuous immersion

Additional letter (optional)
Specific information on the product

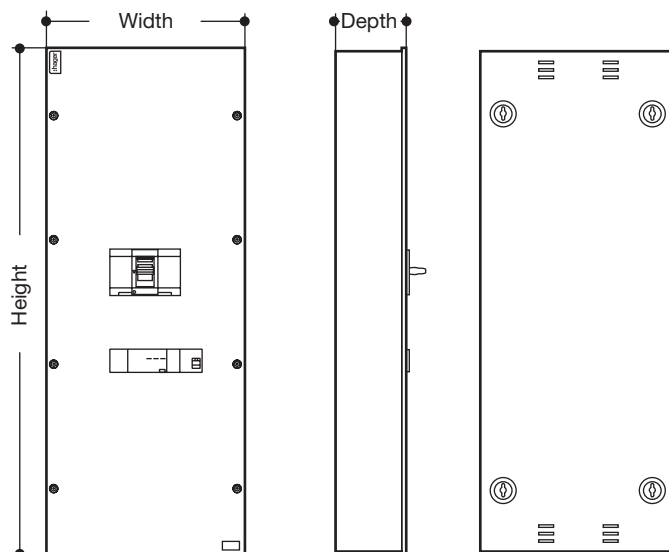
	Description
H	High voltage apparatus
M	Motion during water test
S	Stationary during water test
W	Weather conditions

Interface Characteristics	JG44BM, JG45BM, JG46BS, JG47BS	JG48BM, JG50BS, JG49BM, JG51BS	JG36BM, JG37BM, JG40BM, JG42BS, JG41BM, JG43BS	JG37BR, JG38BR	JG45BR
Rated & operational voltage (U _n / U _e)	415V A.C. 50Hz				
Rated insulation voltage (U _i)	690V A.C. 50Hz				
Rated impulse withstand voltage (U _{imp})	6kV				
Rated current of the Assembly (I _{nA})	400A	630A	JG36BM, JG37BBM -160A JG40BM, JG42BS, JG41BM, JG43BS - 250A	JG37BR - 160A JG38BR - 200A	375A
Rated conditional short-circuit current of the assembly (I _{cc})*	50kA		25kA		50kA
Standards - Enclosed MCCB assembly	BS EN 61439-2				
Standards - MCCB only	BS EN 60947-2				
Rated frequency (fn)	50 Hz				
Pollution degree	3				
Types of system earthing for which the ASSEMBLY is designed	TNC-S, TN-S and TT when installed in an electrical system conforming to BS 7671				
Intended locations	Indoor use only				
Stationary assembly external design	Wall mounted				
Degree of protection	IP30 with cover fitted				
Intended use	Skilled persons only				
Electromagnetic compatibility (EMC) classification	EMC Environment B				
External design	Wall-mounted, surface type, enclosed assembly.				
Mechanical impact protection	IK05				
Form of seperation	Form 2a				
Connection of functional unit: Incoming/outgoing circuit protection	F (fixed)				
Incoming Line Terminal(s)	M10 Bolt	M12 Bolt	M8 Socket Cap Screw		M10 Bolt
Incoming Neutral Terminal	M10 Bolt		JG37BM, JG41BM, JG43BS - M8 Socket Cap Screw JG36BM, JG40BM, JG42BS - M10 Bolt	M8 Socket Cap Screw	M10 Bolt
Enclosure Earth Stud	M10	M12	M8		M10

Enclosed MCCB (63A - 125A)

Characteristics

Series	JG25BM, JG26BM, JG27BM, JG27BR, JG28BM, JG29BM, JG30BM, JG31BM, JG32BM, JG33BM, JG30BR, JG34BS, JG35BS
MCCB	63A to 125A MCCB
MCCB + RCCB Add on block	63A & 100A
Voltage rating in AC	240 / 415 V
IP Protection	IP3X
Enclosure body type	Steel
Enclosure paint type	Powder coat Grey white BS 4800 00A01
Terminal Connection capacity	
Maximum terminal capacity	95mm ²
Enclosure earth stud	M8
Installation	
Mounting	Wall



	Dimensions (mm)			(kg)
	Height	Depth	Width	Weight
JG25BM	420	106	200	3.9
JG26BM	420	106	200	4.5
JG27BM	420	106	200	4.5
JG27BR	420	106	300	20
JG28BM	420	106	200	3.9
JG29BM	420	106	200	4.5
JG30BM	420	106	200	4.5
JG31BM	420	106	200	3.9
JG32BM	420	106	200	4.5
JG33BM	420	106	200	4.5
JG30BR	420	106	300	8
JG34BS	420	106	200	4.5
JG35BS	420	106	200	4.5
JG44BM	900	151	400	21.9
JG46BS	900	151	400	21.9
JG45BM	900	151	400	23.2
JG47BS	900	151	400	23.2
JG48BM	1130	153	500	29.6
JG50BS	1130	153	500	29.6
JG49BM	1130	153	500	32.1
JG51BS	1130	153	500	32.1
JG36BM	660	135	260	10.5
JG37BM	660	135	260	10.5
JG40BM	660	135	260	10.5
JG42BS	660	135	260	10.5
JG41BM	660	135	260	10.5
JG43BS	660	135	260	10.5
JG37BR	865	120	260	11.5
JG38BR	865	120	260	11.5
JG45BR	1019	151	400	21.9

Torque settings

M8	13Nm
M10	22Nm
M12	45-65Nm

Electrical Characteristics

	MLN	MTN	NBN	NCN	NDN	HMF*	HMC*	HMD*
Poles	SP+SN	SP	SP DP TP 4P	SP DP TP 4P	SP DP TP 4P	SP DP TP 4P		
Rated Operational Voltage U_e (V)	230	230	230 / 400	230 / 400	230 / 400	230/400		
Nominal Current	6 - 40A	6 - 63A	6 - 63A	0.5 - 63A	0.5 - 63A	80 - 125A		
Breaking Capacity (I_{cn}) to BS EN 60898	6kA	6kA	10kA	10kA	10kA	10kA		15kA
Breaking Capacity (I_{cs}) to BS EN 60898	6kA	6kA	7.5kA	7.5kA	7.5kA	7.5kA	7.5kA	
Breaking Capacity (I_{cu}) to BS EN 60947 Part 2	N/A	N/A	15kA	15kA	15kA	N/A		15kA
Breaking Capacity (I_{cs}) to BS EN 60947 Part 2	N/A	N/A	7.5kA	7.5kA	7.5kA	N/A	7.5kA	
Rated Insulation Voltage U_i (V)	500V	500V	500V	500V	500V	500V		
Rated Impulse Voltage U_{imp} (kV)	4kV	4kV	6kV	6kV	6kV	6kV		
Electrical Endurance	10,000 cycles	10,000 cycles						
Connection of Auxiliaries	No		Yes					

Table 1

*Din rail mount only, not for use in fixed busbar distribution boards.

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 our circuit breakers is very much lower than that required by the British 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	13	16	20	25	32	40	50	63
Watts loss per pole	1.2	1.3	1.5	2.0	1.8	1.4	1.9	2.1	2.5	2.8	3.2	3.8	4.0	4.5	5.1

For use with DC

Because of their quick make and break design and excellent arc quenching capabilities, our circuit breakers are suitable for DC applications.

The following parameters must be considered:

1. System voltage:
Determined by the number of poles connected in series (see **Table 14**).

2. Short circuit current:
(See **Table 14**).

3. Tripping Characteristics:
If the thermal trip remains unchanged the magnetic trip will become less sensitive requiring derating by $\sqrt{2}$ the ac value (See **Table 14**).

No. of poles	1 pole		2 poles in series	
Range	max voltage	breaking capacity $L/R=15ms$	Max voltage	breaking capacity $L/R=15ms$
MTN	60V	6kA	125V	6kA
NCB NCN NDN	60V	10kA	125V	10kA

Table 13

Characteristic curve	B		C		D	
Magnetic strip	50Hz	dc	50Hz	dc	50Hz	dc
I _{rm1}	3In	4.5 In	5In	7.5 In	10 In	15 In
I _{rm2}	5In	7.5 In	10In	15 In	20 In	30 In

Table 14

Connection

The circuit breaker can have the line/load connected to either the top or bottom terminals

Temperature Derating

MCBs are designed and calibrated to carry their rated current and to operate within their designated thermal time/current zone at 30°C. Testing is carried out with the breaker mounted singly in a vertical plane in a controlled environment. Therefore if the circuit breaker is required to operate in conditions which differ from the reference conditions, certain factors have to be applied to the standard data.

I _n (A)	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
0.5	0.72	0.7	0.68	0.66	0.64	0.62	0.6	0.58	0.56	0.54	0.52	0.5	0.48	0.46	0.44	0.42	-	-
1	1.44	1.4	1.36	1.32	1.28	1.24	1.2	1.16	1.12	1.08	1.04	1	0.96	0.92	0.88	0.84	0.8	0.76
2	2.88	2.8	2.72	2.64	2.56	2.48	2.4	2.32	2.24	2.16	2.08	2	1.92	1.84	1.76	1.68	1.6	1.52
3	4.32	4.2	4.08	3.96	3.84	3.72	3.6	3.48	3.36	3.24	3.12	3	2.88	2.76	2.64	2.52	2.4	2.28
4	5.76	5.6	5.44	5.28	5.12	4.96	4.8	4.64	4.48	4.32	4.16	4	3.84	3.68	3.52	3.36	3.2	3.04
6	8.64	8.4	8.16	7.92	7.68	7.44	7.2	6.96	6.72	6.48	6.24	6	5.76	5.52	5.28	5.04	4.8	4.56
10	14.4	14	13.6	13.2	12.8	12.4	12	11.6	11.2	10.8	10.4	10	9.6	9.2	8.8	8.4	8	7.6
13	18.7	18.2	17.7	17.2	16.6	16.1	15.6	15.1	14.6	14.0	13.5	13	12.5	12	11.4	10.9	10.4	9.9
15	21.6	21	20.4	19.8	19.2	18.6	18	17.4	16.8	16.2	15.6	15	14.4	13.8	13.2	12.6	12	11.4
16	23	22.4	21.8	21.1	20.5	19.8	19.2	18.6	17.9	17.3	16.6	16	15.4	14.7	14.1	13.4	12.8	12.2
20	28.8	28	27.2	26.4	25.6	24.8	24	23.2	22.4	21.6	20.8	20	19.2	18.4	17.6	16.8	16	15.2
25	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19
32	46.1	44.8	43.5	42.2	41	39.7	38.4	37.1	35.8	34.6	33.3	32	30.7	29.4	28.2	26.9	25.6	24.3
40	57.6	56	54.4	52.8	51.2	49.6	48	46.4	44.8	43.2	41.6	40	38.4	36.8	35.2	33.6	32	30.4
50	-	-	-	-	-	62	60	58	56	54	52	50	48	46	44	42	40	38
63	-	-	-	-	-	-	-	-	-	-	-	63	60.5	58	55.4	52.9	50.4	47.9

Diversity Factor - Commercial Distribution boards to BS EN 61439-3

Consideration should be given to the proximity heating effect of the breakers when fully loaded and mounted together in groups.

Adjacent circuit breakers having a load 'on' time exceeding 30 minutes or where the load not exceeding 30 minutes has an 'off' time less than the 'on' time, will need to have the rated diversity factor applied.

No. of Outgoing Circuits	Assumed Loading Factor
2 and 3	0.8
4 and 5	0.7
6 to 9 inclusive	0.6
10 and above	0.5

Frequency

Circuit breakers are designed to operate at a frequency of 50-60Hz. Should the supply differ from this then the following factors should be applied

Thermal – unchanged

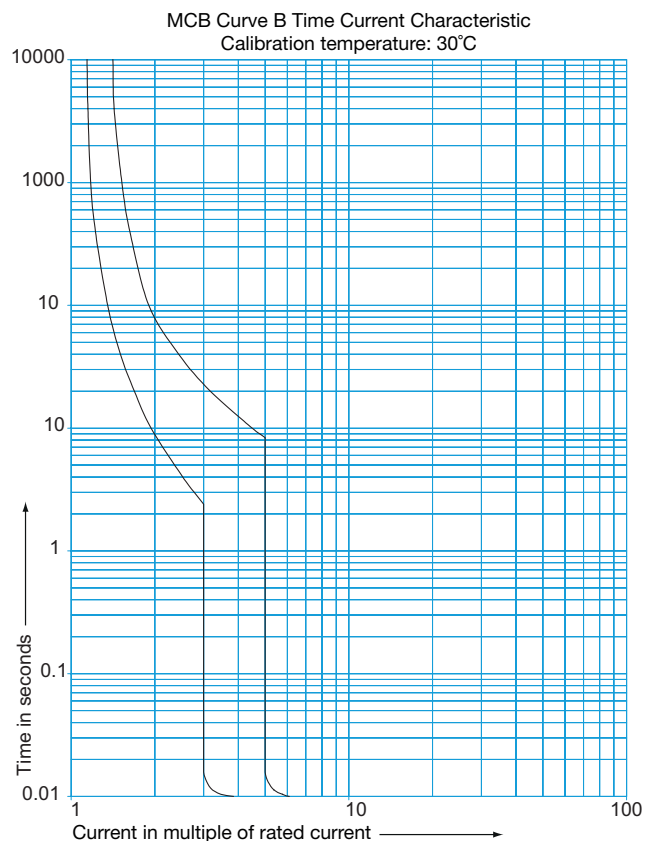
Magnetic – value multiplied by coefficient K

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

Consideration should be given to the proximity heating effect of the breakers when fully loaded and mounted together in groups. (continuously & simultaneously loaded).

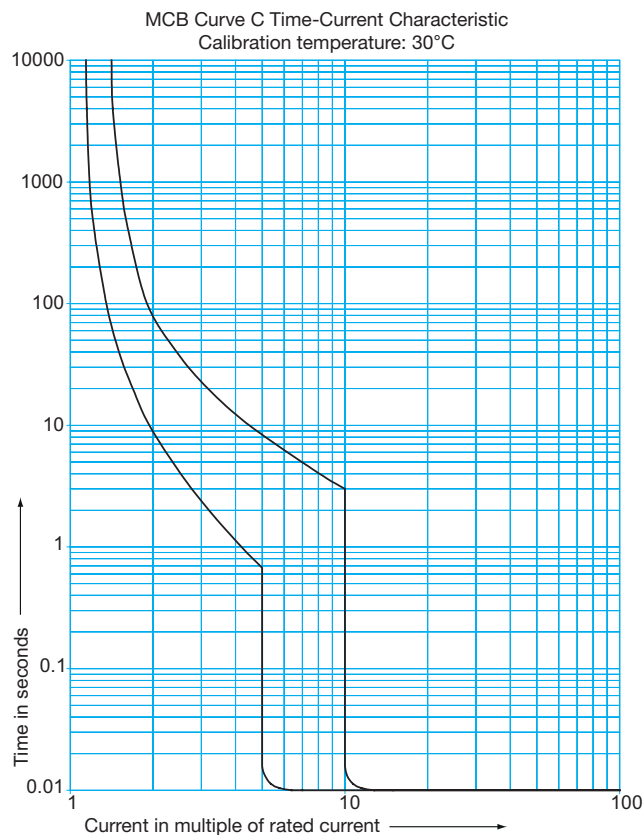
B Curve (BS EN 60898)

MCBs: MTN rated 6 - 63A
NBN rated 6 - 63A



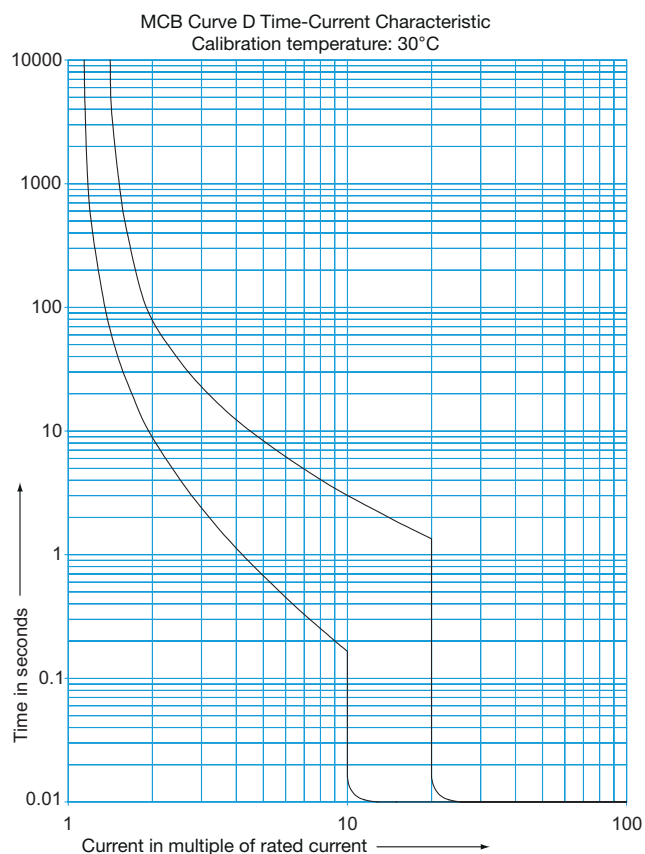
C Curve (BS EN 60898)

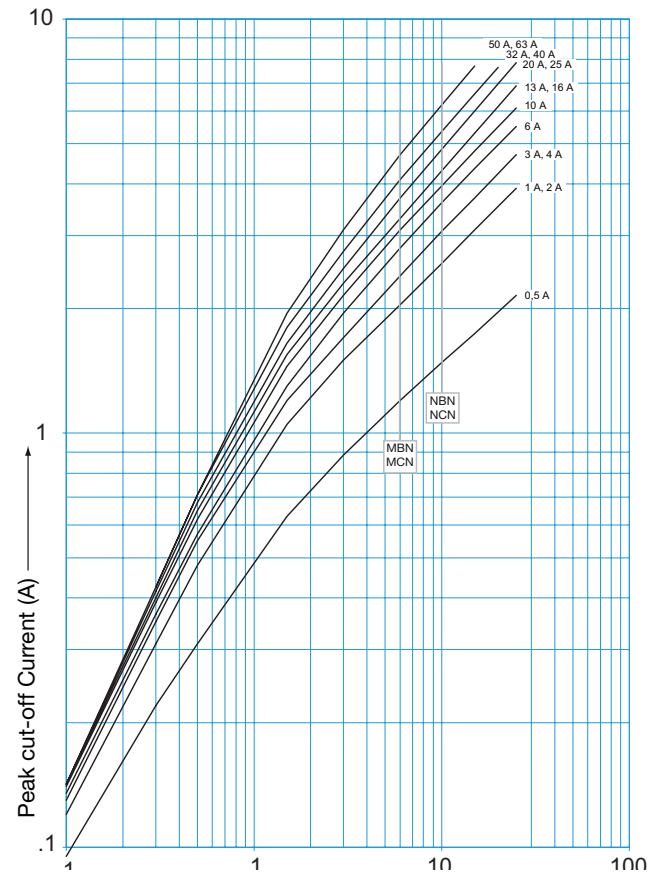
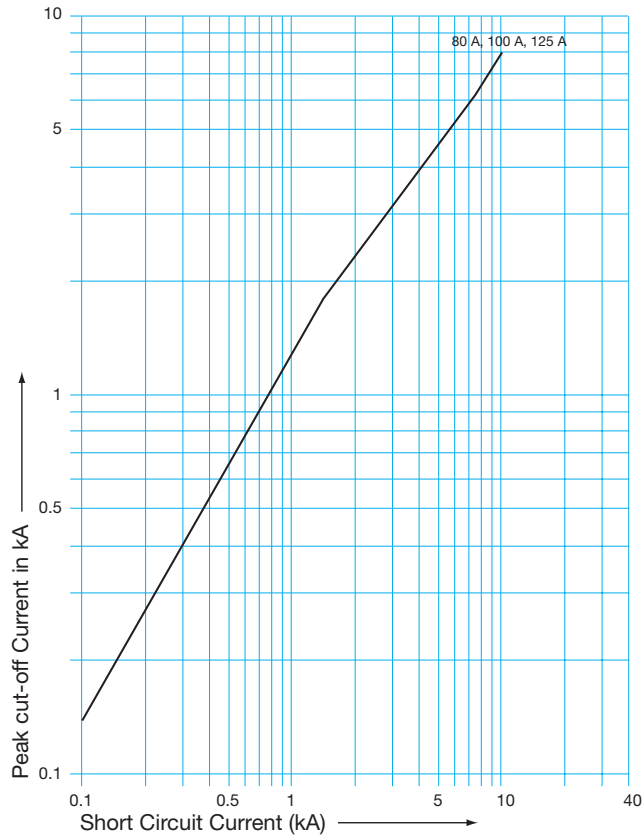
MCBs: NCN rated 0.5 - 63A
MLN rated 2 - 32A
HMF/HMC rated 80 - 125A



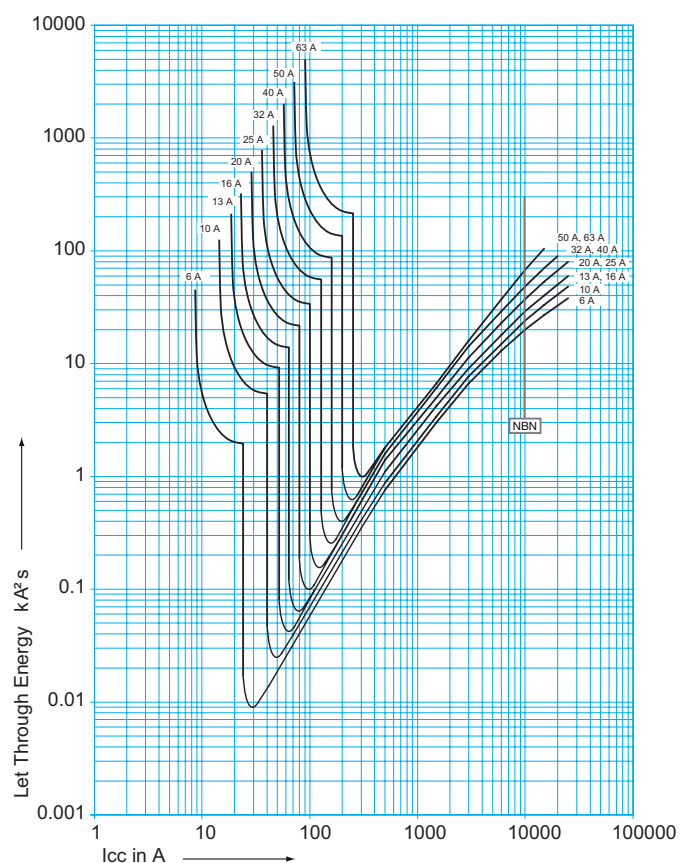
D Curve (BS EN 60898)

MCBs: NDN rated 6 - 63A
HMD rated 80 - 125A

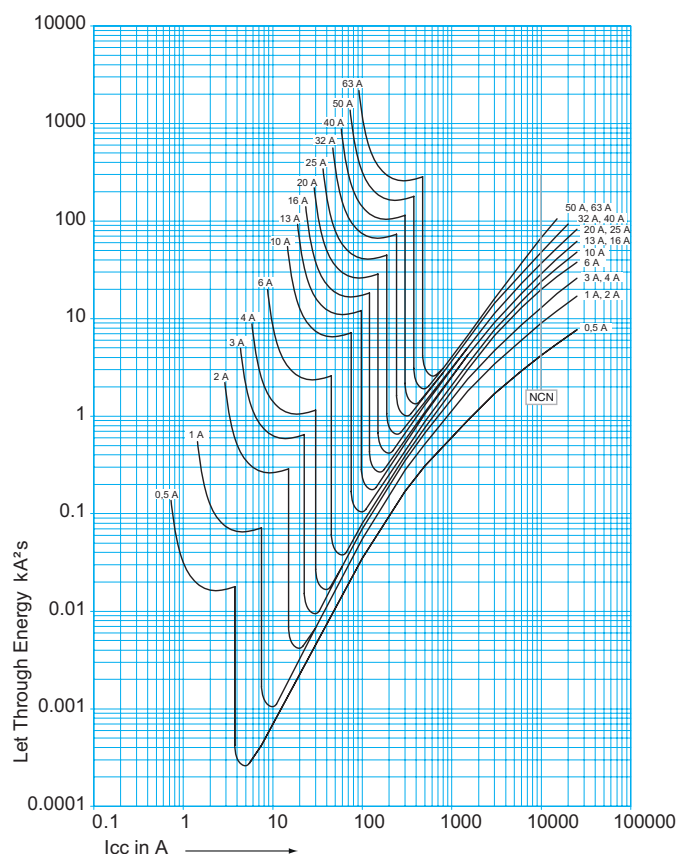




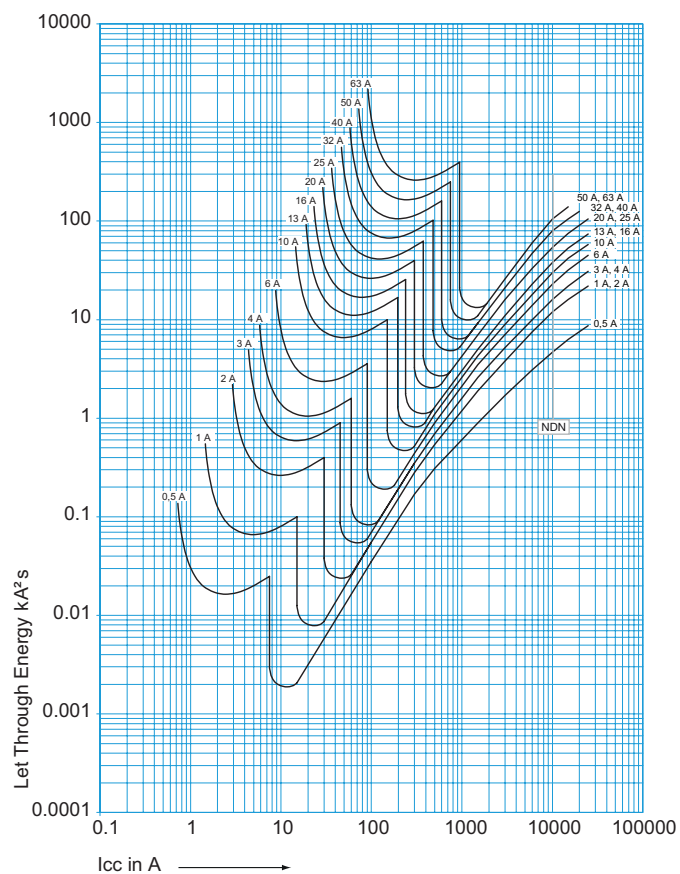
B Curve



C Curve



D Curve



Functions

Tripping and indication auxiliary contacts are common to the range of multi-pole 10kA MCBs, and RCCBs. They should be mounted on the left hand side of the device.

Auxiliary Contact MZ201 (Fig 9)

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

Auxiliary Contact and Alarm Contact MZ202

This accessory has two separate functions. Like the MZ201 auxiliary contact, however the alarm contact will provide indication if the breaker trips under fault conditions.

Wiring Diagram

MZ201 Auxiliary Contact and Alarm Contact

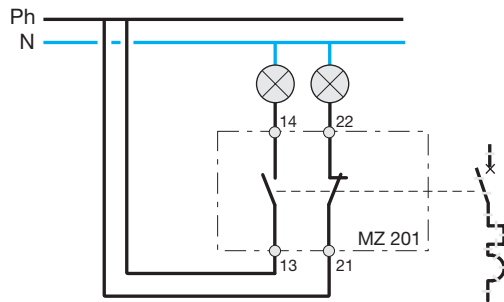


Fig. 9

Electrical Characteristics

MZ201/MZ206	MZ203	MZ206
1 x O 1 x C Contact 230V ~ 6A AC-1		
	230 - 415~ 110 - 130...	230V~ 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 (MZ201 and MZ202) and then the release auxiliary (MZ203 and MZ206).

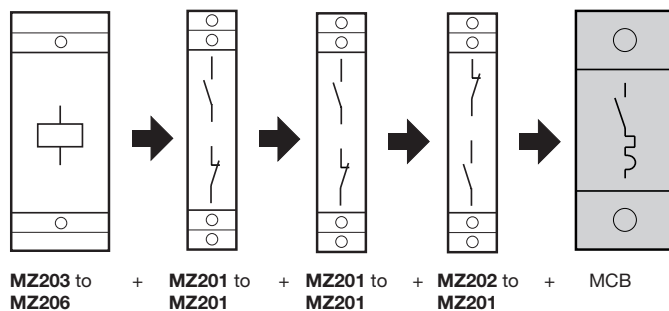


Fig. 11

MZ203 Shunt Trip*

Allows tripping of the device by feeding the coil. The contacts also allow for remote indication of operation.

MZ206 Under Voltage Release* (Fig 10)

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

* Indication that the product has tripped due to the voltage release is provided by a flag on the product.

MZ206 Under Voltage Release

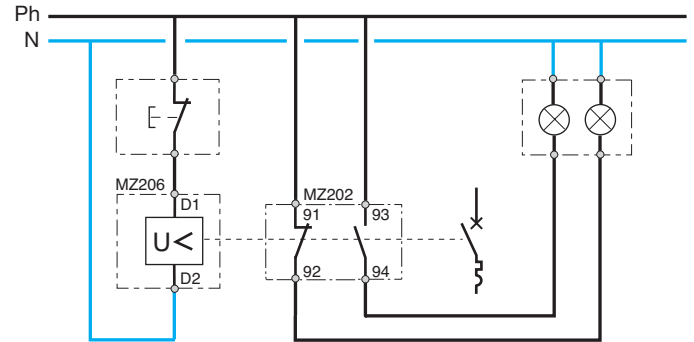


Fig. 10

Electrical connection

By terminal fitted with fixed clamp screws wiring capacity.

Flexible : 2 x 1.5mm²

Rigid : 2 x 1.5mm²

MZ203

Power - 8VA

tolerance : -15% of U_n

MZ206

Latching voltage is between 35 and 70% of U_n 230V~

Coil consumption 3VA

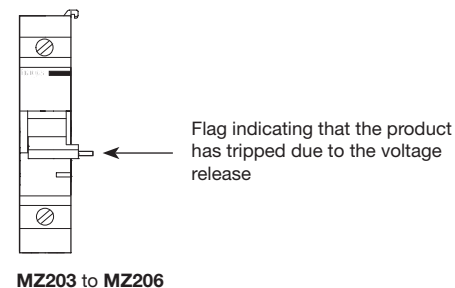


Fig. 12

Earth Fault Loop impedance (Z_s) values for MCBs and MCCBs

Below are the maximum permissible values of Z_s to obtain disconnection for compliance with BS 7671:2018 Amendment 1:2020

I_n	Max Let-Through Energy (kA^2s) at PSCC			Max Z_s (ohms)	
	3kA	6kA	10kA	0.2 - 1s sec	5 sec
MTN/NBN (B Curve)					
6	5.9	10.5	15	7.28	7.28
10	6.5	12.2	21.5	4.37	4.37
16	8.0	17.5	30	2.73	2.73
20	8.8	19.5	34	2.19	2.19
25	10	21	38	1.75	1.75
32	11	24	42	1.37	1.37
40	12.5	29	50	1.09	1.09
50	15	34	61	0.87	0.87
63	16	38	72	0.69	0.69
NCN/HM (C Curve)					
0.5	0.01	0.01	0.01	43.7	62.43
1	4.0	7.0	10	21.85	31.21
2	4.0	7.0	10	10.93	15.61
3	5.0	10.0	15	7.28	10.40
4	5.9	10.5	15	5.46	7.80
6	5.9	10.5	15	3.64	5.20
10	6.5	12.2	21.5	2.19	3.12
16	8.0	17.5	30	1.37	1.95
20	8.8	19.5	34	1.09	1.56
25	10	21	38	0.87	1.25
32	11	24	42	0.68	0.98
40	12.5	29	50	0.55	0.78
50	15	34	61	0.44	0.62
63	16	38	72	0.35	0.50
80	-	-	-	0.27	0.39
100	-	-	-	0.22	0.31
125	-	-	-	0.1	0.25
NDN (D Curve)					
0.5	0.01	0.01	0.01	21.85	62.43
1	4.0	7.0	10	10.93	31.21
2	4.0	7.0	10	5.46	15.61
3	5.0	10.0	15	3.64	10.40
4	5.9	10.5	15	2.73	7.80
6	5.9	10.5	15	1.82	5.20
10	6.5	12.2	21.5	1.09	3.12
16	8.0	17.5	30	0.68	1.95
20	8.8	19.5	34	0.55	1.56
25	10	21	38	0.44	1.25
32	11	24	42	0.34	0.98
40	12.5	29	50	0.27	0.78
50	15	34	61	0.22	0.62
63	16	38	72	0.17	0.50
80				0.14	0.39
100				0.11	0.31
125				0.09	0.25

[illegible]

Residual Current Devices

A residual current device (RCD) is the generic term for a device which simultaneously performs the functions of detection of the residual current, comparison of this value with the rated residual operating value and opening the protected circuit when the residual current exceeds this value. These devices can take several different forms i.e. Residual Current Circuit Breaker (RCCB), Residual Current Circuit Breaker with integral Overload protection (RCBO), or a residual current device incorporated within a socket outlet or other accessory (SRCD)

Residual current circuit breakers (RCCB) protect against earth faults only and not short circuits. They are usually therefore used in conjunction with overcurrent protective devices.

MCB/RCCB Co-ordination

Short circuit capacity of the RCCB only

With MCB's

RCCB		MTN 6-63A B	NBN 6-63A B	NCN 6-63A C	NDN 6-63A D
2 poles					
16A	1500A	6kA	10kA	10kA	6kA
25A	1500A	6kA	10kA	10kA	6kA
40A	1500A	6kA	10kA	10kA	6kA
63A	1500A	6kA	10kA	10kA	6kA
80A	1500A	6kA	10kA	10kA	6kA
100A	1500A	6kA	10kA	10kA	6kA
4 poles					
16A	1500A	6kA	6kA	6kA	4.5kA
25A	1500A	6kA	6kA	6kA	4.5kA
40A	1500A	6kA	6kA	6kA	4.5kA
63A	1500A	6kA	6kA	6kA	4.5kA
80A	1500A	6kA	6kA	6kA	4.5kA
100A	1500A	6kA	6kA	6kA	4.5kA

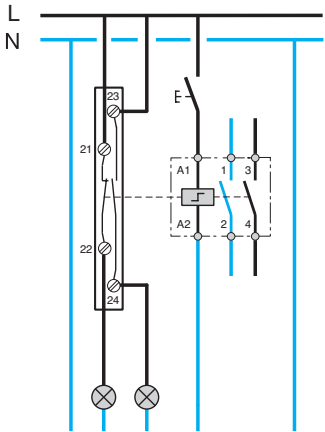
Technical Characteristics

	EPN510 EPN515 EPN520	EPN513 EPN518 EPN524	EPN519 EPN521	EPN525 EPN540	EPN528 EPN541	EPN529
Voltage	230V	24V	12V	230V	24V	12V
Start Consumption	24VA	24VA	24VA	48VA	47VA	TBC
Contact Rating AC1	-	-	16A 250V~ ¹	-	-	-
Electrical Endurance AC1 - 16A	150,000 Operations					
Mechanical Endurance	500,000 Operations					
Current in Open Position	8 mA					
Max Duration of Voltage Supply to Coil	1h					
Min Duration of Current Supply to Coil	0.1s					
Working Temperature	-5 to +40°C					
Storage Temperature	-40 to +80°C					
Connections						
Coil: Flexible Rigid	0.5 to 4mm ² 1 to 6mm ²					
Power: Flexible Rigid	1 to 6mm ² 1.5 to 10mm ²					

¹ 400~ for EPN540 and EPN541.

Auxiliary Contacts (EPN051)

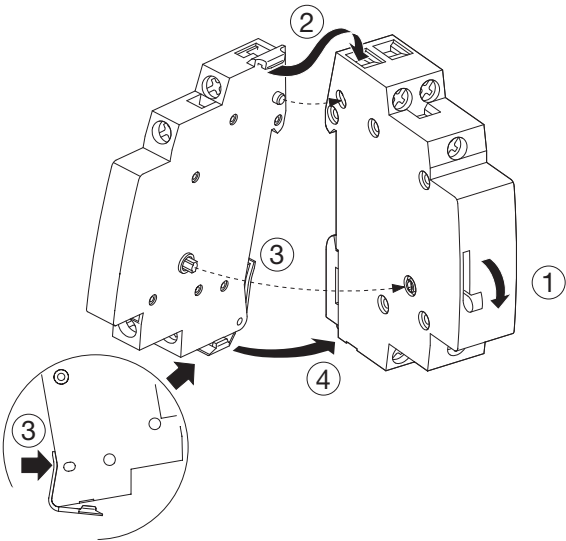
The range of latching relays have been designed for use with an auxiliary contact. The devices simply clip on the side of the relay.



Technical Characteristics

	EPN051
Voltage	-
Contact Rating	2A / 250V
Imin / 230V	15mA

¹ Voltage dependant on associated relay



Heating

The choice of the contactor depends on the mechanical endurance (number of operations) and on the electrical heating load i.e. resistive elements, infra-red element, convectors.

Choice of Contactors

The choice of contactor is dependant upon many parameters i.e. operating voltage, size of contacts, number of operations, ambient temperature, type of load supplied etc.

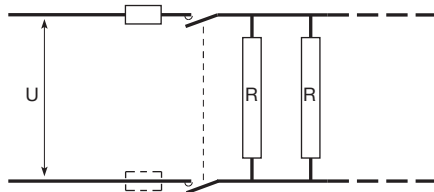
Type of Load

Loads are categorised into various AC ratings, (AC1, AC2, AC3 etc.) and the higher the AC rating the more inductive the load becomes. All Hager contactor ratings are given at AC1, therefore they must be de-rated if used on other types of AC load.

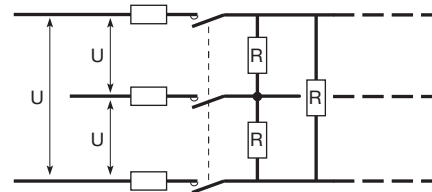
Heat Dissipation Inserts

The ambient temperature around a contactor can affect its life expectancy, therefore, we strongly recommend that heat dissipation inserts (**LZ060**) are fitted between all contactors and adjacent devices.

Single Phase



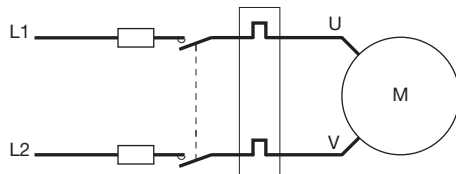
Three Phase



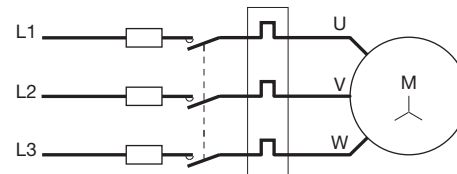
			Number of operations				
			100,000	150,000	200,000	500,000	1,000,000
Max. load in kW	230V	16A	3	2.5	1.9	0.85	0.7
		25A	4.6	4	3	1.35	1
		40A	7.3	6.3	4.7	2.2	1.6
		63A	11.6	10	7.5	3.5	2.5
	400V	16A	8.9	8	5.8	2.8	2
		25A	13.8	12	8.6	4.3	3
		40A	22	18.5	14.385	6.3	5
		63A	35	30	22.6	10.2	7.6

Contactor selection when using with motors

Single Phase 230V (AC3 or AC7b)



Three Phase 400V (AC3 or AC7b)



		Single Phase with Capacitor 230V	Three Phase (AC3 or AC7) 400V	Choice of Contactor According to control diagram	
				2 Wires	3 Wires
Maximum load in kW	0.88			2 pole 25A	
	2.6			2 pole 40A	
			2.6		3 pole 25A
			7.8		3 pole 40A
			10		3 pole 63A

Requirements of Use

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 50,000 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

Close Fitting

It is necessary to put a heat dissipation insert (reference **LZ060**) between each contactor.

Description		Modular contact						Auxiliary contact
Standard conformity		EN 61095						
Approvals		NF - VDE- IMQ - KEMA - RMC / CCC						
		Relay	Contact	Relay	Contact	Contact	Contact	Contact
Number of modules		1		2		3		½
Thermal current I _{th} (40°C)		16A	25A	16A	25A	40A	63A	6A
Rated frequency		50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Rated insulation voltage (U _i)		250V	250V	440V	440V	440V	440V	250V
Rated impulse withstand voltage (U _{imp})		4kV	4kV	4kV	4kV	4kV	4kV	4kV
Pollution Degree		2	2	2	2	2	2	2
Rated Operating currents and power ratings in AC								
AC-1 / AC-7a	Rated operational currents I _e	16A	16A	16A	25A	40A	63A	-
	Rated operational power 230V	3kW	4.6kW	3kW	4.6kW	7.3kW	11.6kW	-
	400V	-	-	8.9kW	13.8kW	22kW	35kW	-
AC-3 / AC-7b	Rated operational currents I _e	5.5A	8.5A	5.5A	8.5A	25A	32A	-
	Rated operational power 230V	570W	880W	570W	880W	2.6kW	3.3kW	-
	400V	-	-	1.7kW	2.6kW	7.8kW	10kW	-
AC-12	Rated operational currents i.e. @ 230V	-	-	-	-	-	-	6A
AC-15	Rated operational currents i.e. @ 230V	-	-	-	-	-	-	2A
Mechanical and Electrical Endurances								
Mechanical endurance	Number 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 @ I _e AC7a (AC12 for aux contact)	Number of operations	60,000	60,000	60,000	60,000	60,000	60,000	60,000
MCB Protected short-circuit withstand								
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
Power dissipation								
Power dissipation per current path		1W	1.5W	1W	1.5W	3.2W	5W	0.4W
Magnetic system for Eco and standard contactor								
Pick-up		2.2W	2.2W	2.8W	2.8W	5W	5W	-
Coil consumption		2.2W	2.2W	2.8W	2.8W	5W	5W	-
Closing delay		25ms	25ms	25ms	25ms	25ms	25ms	-
Opening delay		15ms	15ms	15ms	15ms	20ms	20ms	-
Connection								
Main contact cable section	Rigid	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	4...25mm ²	4...25mm ²	1...6mm ²
	Flexible	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	4...16mm ²	4...16mm ²	1...6mm ²
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 ²	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	-
	Flexible	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	-
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	-
Working temperature		-10°C to +50°C						
Storage temperature		-40°C to +80°C						

Lighting systems with electronic ballasts cause inrush current peaks. Therefore we recommend you use the chart below to determinate the maximum amount of lamps that can be connected to a Hager contactor. The chart gives the maximum amount of lamps per contact. In 2014 the performances of the contactors in combination with lights increased. The products identified on the front face with the '+' can accept a higher number of lamps. For these products, see the figures in the column with the '+' in the header.

	Lamp Power	16A	25A	16A +	25A +	40A	63A
Compact fluo lamps							
Compact fluo lamp with external electronic ballast	5W	11	15	17	27	49	76
	7W	11	15	17	27	49	76
	9W	9	13	16	26	40	63
	11W	9	13	16	26	40	63
	15W	7	11	14	22	36	57
	18W	7	11	14	22	36	57
	20W	7	11	14	22	36	57
	23W	7	11	14	22	36	57
	26W	7	11	14	22	36	57
Compact fluo lamp with integrated electronic ballast	5W	17	27	34	54	86	135
	7W	17	27	34	54	86	135
	9W	17	27	34	54	86	135
	11W	17	27	34	54	86	135
	15W	17	27	34	54	86	135
	18W	13	20	25	40	63	100
	20W	13	20	25	40	63	100
	23W	13	20	25	40	63	100
	26W	13	20	25	40	63	100
Incandescent lamps							
Tungsten & halogen lamps 230V	40W	32	50	36	57	76	120
	60W	21	33	28	45	67	105
	75W	17	27	24	38	63	100
	100W	13	20	17	28	41	65
	150W	8	13	11	18	29	45
	200W	6	9	8	14	22	35
	300W	4	7	6	10	15	23
	500W	2	3	3	6	9	14
	1000W	0	0	1	2	4	7
Tungsten & halogen lamps 12 ou 24V	20W	13	20	25	40	139	218
	35W	8	13	16	26	82	129
	50W	6	9	11	18	60	94
	75W	4	6	7	12	52	82
	100W	2	3	3	6	35	55
	150W	1	2	2	4	20	31
LED							
LED 230V with integrated electronic ballast - non dimmable	4W	17	27	34	54	86	135
	4.5W	17	27	34	54	86	135
	6W	17	27	34	54	86	135
	7W	17	27	34	54	86	135
	8W	17	27	34	54	86	135
	12W	17	27	34	54	86	135
	17W	13	20	25	40	63	101
	18W	13	20	25	40	63	101
	22W	13	20	25	40	63	101
	30W	9	14	17	28	44	70
	34W	9	14	17	28	44	70
	40W	9	14	17	28	44	70
	50W	7	11	14	22	35	55
LED 230V with integrated electronic ballast - dimmable	4W	38	60	76	120	159	250
	5.5W	38	60	76	120	159	250
	6W	38	60	76	120	159	250
	7W	38	60	76	120	159	250
	8W	38	60	76	120	159	250
	12W	38	60	76	120	159	250
	17W	28	44	56	88	118	185
	18W	28	44	56	88	118	185
	22W	28	44	56	88	118	185
	30W	20	31	39	62	82	130
	34W	20	31	39	62	82	130
	40W	20	31	39	62	82	130
	50W	16	24	30	48	65	102
LED 230V headlight with integrated electronic ballast	100W	-	-	3	5	6	9
	150W	-	-	1	3	4	6
	200W	-	-	1	2	4	6
LED 12V with separated transformer - dimmable	1W	38	60	76	120	180	220
	2.5W	38	60	76	120	180	220
	4W	38	60	76	120	180	220
	5W	38	60	76	120	180	220
	7W	38	60	76	120	160	200
	10W	38	60	76	120	160	200
	15W	28	44	56	88	160	200

	Lamp Power	16A	25A	16A +	25A +	40A	63A
Fluorescent tubes							
T5 double - uncompensated	2 x 18W	13	20	25	40	50	78
	2 x 20W	12	19	24	38	50	78
	2 x 36W	12	15	19	30	44	69
	2 x 40W	10	13	16	26	40	63
	2 x 42W	9	12	15	24	40	63
	2 x 58W	7	9	11	18	27	42
	2 x 65W	6	8	10	16	27	42
	2 x 80W	5	7	8	14	22	35
T5 double - serie compensation	2 x 115W	4	5	6	10	16	25
	2 x 18W	7	11	14	22	34	53
	2 x 20W	7	11	14	22	29	45
	2 x 36W	6	10	12	20	27	42
	2 x 40W	6	10	12	20	27	42
	2 x 42W	6	10	12	20	27	42
	2 x 58W	6	10	12	20	25	39
	2 x 65W	5	7	8	14	23	36
T5 single - electronic ballast	2 x 80W	5	7	8	14	20	31
	2 x 115W	4	5	6	10	17	25
	15W	7	11	14	22	36	57
	18W	7	11	14	22	36	57
	20W	7	11	14	22	36	57
	36W	7	11	14	22	34	53
	40W	7	11	14	22	29	45
	42W	7	11	14	22	29	45
T5 double - electronic ballast	58W	6	10	12	20	27	42
	65W	6	10	12	20	27	42
	80W	6	10	12	20	27	42
	115W	6	10	12	20	25	39
	2 x 18W	7	11	14	22	34	53
	2 x 20W	7	11	14	22	29	45
	2 x 36W	6	10	12	20	27	42
	2 x 40W	6	10	12	20	27	42
T5 single - parallell compensation	2 x 42W	6	10	12	20	27	42
	2 x 58W	6	10	12	20	25	39
	2 x 65W	5	7	8	14	23	36
	2 x 80W	5	7	8	14	20	31
	2 x 115W	4	5	6	10	17	25
Fluorescent tubes							
T5 single - uncompensated	15W	13	20	19	30	70	100
	18W	13	20	19	30	70	100
	20W	12	19	19	30	70	100
	36W	12	15	17	28	60	90
	40W	10	13	16	26	60	90
	42W	9	12	15	24	55	83
	58W	7	9	10	17	35	56
	65W	6	8	10	17	35	56
	80W	5	7	9	15	30	48
	115W	4	5	6	10	20	32
	140W	3	5	6	10	16	26
	15W	7	11	12	20	36	57
T5 single - parallell compensation	18W	7	11	12	20	36	57
	20W	7	11	12	20	36	57
	36W	7	11	12	20	34	53
	40W	7	11	12	20	29	45
	42W	7	11	12	20	29	45
	58W	6	10	9	15	27	42
	65W	6	10	9	15	27	42
	80W	6	10	9	15	27	42
	115W	6	10	9	15	25	39

	Lamp Power	16A	25A	16A +	25A +	40A	63A
Discharge lamps							
High-pressure mercury-vapor lamps - without compensation	50W	9	14	17	28	32	50
	80W	6	9	11	18	24	37
	125W	3	5	6	10	18	28
	250W	2	3	3	6	10	15
	400W	1	1	1	2	6	9
	700W	0	0	0	0	4	5
High-pressure mercury-vapor lamps - parallel compensation	50W	7	11	14	22	26	40
	80W	5	8	10	16	22	34
	125W	3	5	6	10	15	23
	250W	2	3	3	6	9	14
	400W	1	1	1	2	5	8
	700W	0	0	0	0	3	5
Low pressure sodium lamps - without compensation	1000W	0	0	0	0	2	3
	18W	8	10	8	12	17	23
	35W	4	6	7	9	14	20
	55W	3	6	7	9	14	20
	90W	2	4	5	6	9	14
	135W	1	3	3	4	6	8
Low pressure sodium lamps - parallel compensation	180W	1	2	2	4	6	8
	18W	5	7	5	8	12	24
	35W	4	6	4	7	10	23
	55W	3	5	3	5	10	19
	90W	2	3	3	4	8	16
	135W	1	2	1	2	5	7
High pressure sodium lamps - without compensation	180W	1	2	1	2	5	6
	35W	11	14	15	24	30	50
	50W	9	12	10	15	22	34
	70W	8	9	8	12	18	28
	110W	6	8	6	10	14	22
	150W	4	7	5	8	10	16
High pressure sodium-vapour lamps - electronic ballast or parallel compensation	250W	2	4	3	5	6	10
	400W	0	1	1	2	4	6
	1000W	0	1	1	1	2	3
	35W	6	9	11	18	31	50
	50W	6	9	11	18	22	35
	70W	4	6	7	12	16	25
Metal halide lamps - without compensation	110W	3	5	6	8	13	21
	150W	3	5	4	6	8	13
	250W	2	3	3	4	7	11
	400W	1	1	1	2	5	8
	1000W	0	0	0	1	2	3
	35W	12	24	19	30	42	55
Metal halide lamps - electronic ballast or parallel compensation	70W	10	15	12	17	26	36
	150W	6	7	8	12	14	20
	250W	3	5	5	8	9	14
	400W	1	2	2	4	6	9
	1000W	0	0	0	0	3	5
	35W	6	10	12	18	22	39
Metal halide lamps - without compensation	70W	5	8	10	13	22	39
	150W	3	5	6	8	12	22
	250W	3	5	6	7	9	16
	400W	1	1	1	2	5	7
	1000W	0	0	0	1	2	3

Transformer Protection

Tables 19 & 20 show the recommended MCB's for the protection of single phase (230V) and three phase (400V) transformers.

Single Phase 230V

Transformer Rating (VA)	Primary Current	Recommended MCB		
		NBN	NCN	NDN
50	0.22	-	1	6
100	0.43	-	2	6
200	0.87	-	3	6
250	1.09	6	4	6
300	1.30	10	4	6
400	1.74	10	6	6
500	2.17	16	10	6
750	3.26	16	10	6
1000	4.35	25	16	10
2500	10.87	63	40	20
5000	21.74	-	63	32
7500	32.60	-	-	50
10000	43.48	-	-	63

Three Phase 400V

Transformer Rating (VA)	Primary Current	Recommended MCB		
		NBN	NCN	NDN
500	0.72	-	3	6
750	1.08	6	4	6
1000	1.44	10	6	6
2000	2.88	16	10	6
3000	4.33	25	16	10
4000	5.77	32	20	10
5000	7.21	40	25	16
7500	10.82	63	32	20
10000	14.43	-	50	25
15000	21.64	-	63	32
20000	28.86	-	-	50
25000	36.07	-	-	63

Motor Circuit Protection

Tables 28,29,30 and 31 give general recommendations for the selection of circuit breakers and HRC fuses for the protection of motor power circuits and are based on the assumptions shown in Table 28 for a cage motor running at approximately 1400 Rev/Min.

Motor Rating	DOL Starting Conditions	Assisted Start Conditions
Up to 0.75kW	5 x FLC for 6 secs	2.5 x FLC for 15 secs
1.1 to 7.5kW	6 x FLC for 10 secs	2.5 x FLC for 15 secs
11 to 75kW	7 x FLC for 10 secs	2.5 x FLC for 15 secs
90 to 160kW	6 x FLC for 15 secs	2.5 x FLC for 20 secs

1 Phase 230V DOL Starting

kW	hp	FLC A	Recommended Circuit Breaker			
			(A) NBN	(A) NCN	(A) NDN	Fuse (A)
0.18	0.25	2.8	16	10	10	10
0.25	0.33	3.2	16	10	10	16
0.37	0.5	3.5	16	10	10	16
0.55	0.75	4.8	20	16	16	16
0.75	1.0	6.2	25	20	20	20
1.1	1.5	8.7	40	25	25	25
1.5	2.0	11.8	50	32	32	32
2.2	3.0	17.5	-	50	50	40
3.0	4.0	20	-	63	63	50
3.75	5.0	24	-	-	-	63
5.5	7.5	36	-	-	-	80
7.5	10	47	-	-	-	100

3 Phase 400V Assisted Starting Star-Delta

kW	hp	FLC A	Recommended Circuit Breaker		
			(A) NCN	(A) NDN	HRC Fuse (A)
3	4	6.3	16	10	16
4	5.5	8.2	20	10	16
5.5	7.5	11.2	32	16	20
7.5	10	14.4	40	25	25
11	15	21	50	32	32
15	20	27	-	40	35
18.5	25	32	-	50	40
22	30	38	-	63	50
30	40	51	-	-	63
37	50	63	-	-	80
45	60	76	-	-	80
55	75	91	-	-	100
75	100	124	-	-	160
90	125	154	-	-	200
110	150	183	-	-	200
132	175	219	-	-	250
150	200	240	-	-	315
160	220	257	-	-	315

3 Phase 400V DOL Starting

kW	hp	FLC A	Recommended Circuit Breaker			
			(A) NBN	(A) NCN	(A) NDN	HRC Fuse (A)
0.18	0.25	0.87	-	2	-	4
0.25	0.33	1.17	-	3	-	4
0.37	0.5	1.2	-	3	-	4
0.55	0.75	1.8	-	4	-	6
0.75	1.0	2.0	10	6	6	6
1.1	1.5	2.6	16	10	6	10
1.5	2.0	3.5	16	10	10	16
2.2	3.0	4.4	20	16	16	16
3.0	4.0	6.3	25	20	20	20
4.0	5.5	8.2	32	25	25	25
5.5	7.5	11.2	50	40	40	32
7.5	10	14.4	63	50	50	40
11	15	21	-	-	-	63
15	20	27	-	-	-	80
18.5	25	32	-	-	-	80
22	30	38	-	-	-	80
30	40	51	-	-	-	100
37	50	63	-	-	-	125
45	60	76	-	-	-	125
55	75	91	-	-	-	160
75	100	124	-	-	-	200
90	125	154	-	-	-	250
110	150	183	-	-	-	315
132	175	219	-	-	-	355
150	200	240	-	-	-	355
160	220	257	-	-	-	355

		SPN802 / SPN802R	
Tested to		EN 61643-11 (VDE0675-6-11) 2002-12	
		L1/L2/L3 => N	N => PE
SPD type / class		Type 1 + Type 2 / I / B	
Type of connection		Parallel connection	
Type of power supply system		TN/TT - System	
Type of protection		Common and differential modes	
Nominal voltage	U _N	230V / 400V ac	
Rated voltage	U _C	255V ac	
Voltage protection level	U _p	≤ 1.5kV	255V ac
TOV-voltage	U _T	440V / 5s	1200V / 200ms
Rated load current	I(L)	315A	
	I(L-L)	125A	
Follow current interrupting rating	I _{fi}	50 kA	100kA
Nominal discharge current (8/20)	I _n	25kA	100kA
Impulse current (10/350)	I _{imp}	25kA	100kA
Residual current	I _{PE}	≤ 100mA	
Max. rating of overcurrent protection	fuse	125A gL / gG serial or 315A parallel	
	MCCB	125A serial or 160A parallel	
Short-circuit withstand capability with max. overcurrent protection	fuse	25kA ac	
	MCCB	25kA ac	
Response time	t _A	< 100ns	
Operating temperature range		- 40°C+ 60°C	
Indication of SPD disconnector		Green - red on L1, L2, L3, N	
Cross sectional area	min	10mm ² solid / flexible	
L1, L2, L3, PE	max	50mm ² multi-stranded / 35mm ² flexible	
Tightening torque for terminals		7.0 Nm	
Mounting on		35mm DIN rail in accordance with EN 60715	
Enclosure material		grey thermoplastic, UL 94V-0	
Degree of protection		IP20	
Modular width		8	
Weight		1272 g	
Approval marking		VDE	

		SPA201	SPA401
Tested to		EN 61643-11 2002-12	
SPD type / class		Type 1 + Type 2 / Class I	
Energy-coordinated protection effect on terminal equipment		Type 1 + Type 2	
Energy-coordinated protection effect on terminal equipment ≤ 5 m		Type 1 + Type 2 + Type 3	
Type of connection		Parallel connection	
Type of power supply system		TT / TN system	
Type of protection		common and differential modes	
Nominal voltage	U_N	230V/400V ac	
Rated voltage	U_C	255V ac	
Voltage protection level	U_P	≤ 1.5kV	
TOV Voltage	U_T	440V / 5s 1200V / 200ms	
Rated load current	I(L)	n/a	
	I(L-L)	n/a	
Follow current interrupting rating	I_{fi}	25kA rms 100A rms	
Nominal discharge current (8/20)	I_n	12.5kA 25kA	12.5kA 50kA
	I_{imp}	12.5kA 25kA	12.5kA 50kA
Max. rating of overcurrent protection	fuse	160A gL / gG	
	MCCB	n/a	160A
Short-circuit withstand capability with max. overcurrent protection	fuse	25kA rms	
	MCB	n/a	
Response time	t_A	≤ 100ns	
Operating temperature range		- 40°C+ 80°C	
Indication of SPD disconnector		Green/Red flag on L and N	Green/Red flag on L1, L2, L3 and N
Cross sectional area	min	1,5mm ² solid / flexible	
	max	35mm ² stranded / 25mm ² flexible	
Tightening torque for terminals		4 Nm	
Mounting on		35mm DIN rail in accordance with EN 60715	
Enclosure material		grey thermoplastic, UL 94V-0	
Degree of protection		IP20	
Modular width		2	4
Weight		275 g	480 g
Approval marking		KEMA	

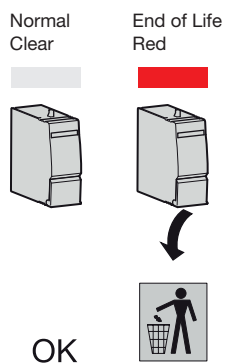
		SPN215D/R	SPN415D/R	SPN440D/R
Tested to		EN 61643-11 (VDE0675-6-11) 2002-12		
SPD type		Type 2 according to EN 61643-11		
Type of connection		Parallel connection		
Maximum continuous operating voltage U_C	Line / Neutral	$\leq 255V$		
	Neutral/ PE	$\leq 275V$		
Voltage protection level	U_p	$\leq 1kV$	$\leq 1kV$	$\leq 1.2kV$
Nominal discharge current (8/20 μs) [(DC+/DC-) --> PE]	I_n	5kA	5kA	15kA
Max. discharge current (8/20 μs)	I_{max}	15kA	15kA	40kA
Short-circuit withstand capability with max. overcurrent protection		10kA - 32A	10kA - 32A	20kA - 32A
Operating temperature range		- 40°C+ 80°C		
Indication of SPD disconnector		Green - Red		
Cross sectional area	min	1,5mm ² solid / flexible		
	max	35mm ² multi-stranded / 25mm ² flexible		
Tightening torque for terminals		4.0 Nm		
Mounting on		35mm DIN rail in accordance with EN 60715		
Enclosure material		grey thermoplastic, UL 94V-0		
Degree of protection		IP20		
Modular width (DIN 43880)		2	2	4
Auxiliary contact. Voltage/ nominal current (only applicable on the R suffix products)		230V/ 0.5A 12Vdc 10mA		

		SPV325
Tested to		EN 61643-11 (VDE0675-6-11) 2002-12
SPD type		Type 2 according to EN 61643-11
Type of connection		Parallel connection
Maximum continuous operating voltage	U_{cpV}	$\leq 1000V$
Voltage protection level	U_p	$\leq 4kV$
Voltage protection level for 5kA	U_p	$\leq 3,5kV$
Total discharge current (8/20 μs)	I_{total}	40kA
Nominal discharge current (8/20 μs)	I_n	12.5kA
Max. discharge current (8/20 μs)	I_{max}	25kA
Short-circuit withstand capability with max. overcurrent protection	I_{scwPV}	50 A / 1000 V DC
Response time	t_A	$\leq 25ns$
Operating temperature range		- 40°C+ 80°C
Indication of SPD disconnector		green - red
Cross sectional area	min	1.5mm ² solid / flexible
	max	35mm ² multi-stranded / 25mm ² flexible
Tightening torque for terminals		4.0 Nm
Mounting on		35mm DIN rail in accordance with EN 60715
Enclosure material		Grey thermoplastic, UL 94V-0
Degree of protection		IP20
Installation width		3 modules, DIN 43880
Weight		316g

Characteristics		
Tested to		EN 61643-11 (VDE0675-6-11) 2007-08
SPD type		Type 3
Ports		one port
Type of connection		Parallel connection
Type of power supply system		TT / TN system
Nominal voltage	U_N	230V ac
Rated voltage	U_C	255V ac
Voltage protection level (L - N)	U_P	$\leq 1.25kV$
Voltage protection level (L/N - PE)	U_P	$\leq 1.5kV$
TOV - Characteristic (L - N)	U_T	335V / 5s
TOV - Characteristic (L/N - PE) (I)	U_T	400V / 5s
TOV - Characteristic (L/N - PE) (II)	U_T	1200V / 200 ms
Rated load current	I_L	16 A _{eff}
Nominal discharge current (8/20)	I_n	3kA
Maximal discharge current (8/20)	I_{max}	5kA
Combination wave (1,2/50 - 8/20) (L - N)	U_{oc}	6 kV
Combination wave (1,2/50 - 8/20) (L/N - PE)	U_{oc}	10 kV
Residual current	IPE	$\leq 5\mu A$
Replacement cartridge		NO
Maximal rating of overcurrent protection	fuse	16 A gL / gG
	MCB	16A B curve
Short-circuit withstand capability with max. overcurrent protection	fuse	6kA eff ac
	MCB	1kA eff ac
Response time	t_A	$\leq 25ns$
Operating temperature range		- 25°C 40°C
Indication of SPD disconnect		NO
Remote signalisation contact		Green light off
Cross sectional area	min	1.5mm ² solid / flexible
	max	10mm ² stranded / 6mm ² flexible
Tightening torque for terminals		1.2 Nm
Mounting on		35mm DIN rail in accordance with EN 60715
Enclosure material		Grey thermoplastic, UL 94V-2
Degree of protection		IP20
Installation width		2 modules, DIN 43880

Reserve Indicator Light

Neutral cartridges cannot be put into spares reserved for phase cartridges and visa versa.



	Non-Adjustable		Adjustable						
	HR500	HR502	HR510	HR520	HR522	HR523	HR525/HR534	HR440	HR441
Supply Voltage ~50/60Hz	220-240V								
Residual Voltage ~50/60Hz	500V Maximum								
Power Absorbed	3VA	5VA							
Output	Volt Free Contacts								
Contact Rating	6A / 250V AC-1								
Sensitivity IΔn	30mA	300mA	30mA / 100mA / 300mA / 500mA / 1A / 3A / 10A		500mA / 1A / 3A / 5A / 10A / 20A / 30A		30mA / 100mA / 300mA / 500mA / 1A / 3A / 5A / 10A / 30A		30mA / 100mA / 300mA / 500mA / 1A / 3A
Instantaneous / Time Delay	Instantaneous		Instantaneous or Time Delay 0.1 - 0.3 - 0.4 - 0.5 - 1 - 3 seconds		Instantaneous or Time Delay 0.1 - 0.2 - 0.25 - 0.3 - 0.4 - 0.5 seconds		Instantaneous or Time Delay 0.02 - 0.1 - 0.3 - 0.4 - 0.5 - 1 - 3 - 5 - 10 seconds		Instantaneous or Time Delay 0.1 - 0.3s - 0.5s - 0.75s - 1s
Torroid Withstand Capacity	50kA / 0.2s								
Distance between Torroid and Relay	50 Meter Maximum								
Relay Cable Connection - Rigid - Flexible	1.5mm² to 10mm² 1mm² to 6mm²								
Torroid Cable Conection - Rigid - Flexible	1.5mm² to 4mm² 1mm² to 2.5mm²								
Relay - Working Temperature - Storage Temperature	-10°C to +55°C -25°C to +40°C		-5°C to +55°C -25°C to +40°C						
Torroid - Working Temperature - Storage Temperature	-10°C to +70°C -40°C to +70°C		-10°C to +70°C -40°C to +70°C						

Main Characteristics

"Reset" Button

When pressed, the output remains switched and return to normal is obtained by either: by pressing the "reset" clear pushbutton or cutting off the power supply. If the "reset" button is not pressed the device remains in the fault position.

Test Button

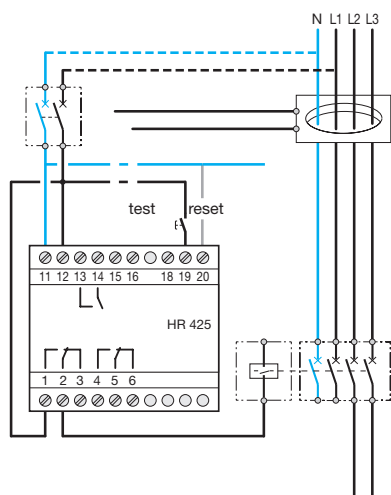
Pressing the test button allows a fault simulation which operates the relay and the output contacts. The fault level display is shown by an LED on the front of the product.

I_{Δn} Selector

Sensitivity setting: 0.03A instantaneous
0.1A/0.3A/1A and 3A time delay

Time Delay Selector

Adjustable time setting - instantaneous / 0.13s / 0.3s / 1s and 3s



Sealable Settings

A sealable cover prevents interference once the settings have been made.

Standard Output (1 C/O contact)

Switching to state 1 on:

- Failure of the core/relay connection
- Fault current in the monitored installation

Positive Safety Outlet (1 C/O contact)

Switching to state 1: Switching on the power

Switching to state 0: Failure of the core/relay connection
fault current in the monitored installation
failure of relay supply
internal failure of relay

Optical scale display by 5 LEDs of the fault in % of I_{Δn}

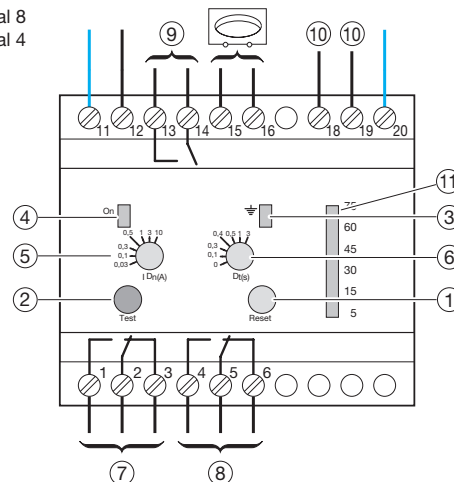
Optical scale display by (5 LEDs) of the fault in % of I_{Δn}

Common pin 6:

State 1 : output terminal 8

State 0 : output terminal 4

1. Reset push button
2. Test push button
3. Fault signal LED
4. Device on indicator
5. Sensitivity setting
6. Time delay setting
7. Standard output
8. Safety output
9. Prealarm output
10. Remote reset
11. Optical scale



Mounting of Circular Torroids

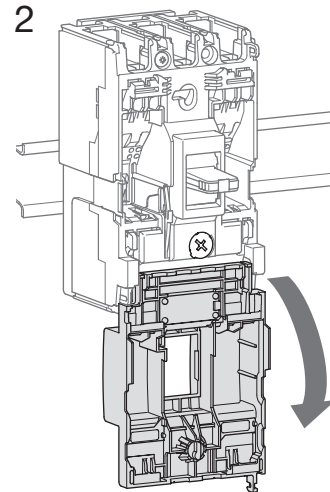
With Cables								
		U 1000 R2V Single Pole	U 1000 R2V Single Pole	U 1000 R2V Multi Pole	U 1000 R2V Multi Pole	U 1000 R2V Multi Pole	H07 V - U Single Pole	H07 V - U Single Pole
Ø	Type of Torroids							
30	HR700	4 x 16mm ²	2 x 50mm ²	35mm ²	35mm ²	50mm ²	4 x 35mm ²	2 x 70mm ²
35	HR701	4 x 25mm ²	2 x 70mm ²	50mm ²	35mm ²	70mm ²	4 x 50mm ²	2 x 95mm ²
70	HR702	4 x 185mm ²	2 x 400mm ² or 4 x 150mm ²	240mm ²	35mm ²	300mm ²	4 x 240mm ²	2 x 400 or 4 x 185mm ²
105	HR703	4 x 500mm ²	2 x 630mm ² or 4 x 185mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
140	HR704	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
210	HR705	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
70 x 175	HR830	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
115 x 305	HR831	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
150 x 350	HR832	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
20 x 30	HR820	4 x 16mm ²	2 x 70mm ²	10mm ²	35mm ²	16mm ²	4 x 10mm ²	2 x 35mm ²
50 x 80	HR821	4 x 240mm ²	2 x 630mm ² or 4 x 185mm ²	120mm ²	35mm ²	150mm ²	4 x 185mm ²	2 x 240mm ²
80 x 80	HR822	4 x 500mm ²	2 x 630mm ² or 4 x 185mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
80 x 120	HR823	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²
80 x 160	HR824	4 x 630mm ²	2 x 630mm ² or 4 x 240mm ²	300mm ²	35mm ²	300mm ²	4 x 400mm ²	2 x 400 or 4 x 240mm ²

Frame	x160				x250			
Product	MCS Switch		MCCB		MCS Switch	MCCB		
Reference	HCA	HDA	HHA	HNA	HCB	HHB	HNB	
Number of poles	[No.] 3-4	1-2-3-4	1-2-3-4	3-4	3-4			
Electrical characteristics								
Rated current	I _n [A]	160			250			
Current rated range	[A]	125-160	16-125 (1P), 16-160 (2, 3, 4P)		250	100-250		
Rated service voltage, (AC)	U _e [V]	220-440			220-440			
Frequency	F [Hz]	50/60			50/60			
Rated insulation voltage	U _i [V]	690			800			
Rated impulse withstand voltage	U _{imp} [kV]	8			8			
Rated ultimate short-circuit breaking capacity, (I _{cu})								
(AC) 50-60 Hz 220/230 V	I _{cu} [kA]	-	25	35	85	-	35	85
(AC) 50-60 Hz 380/415 V	I _{cu} [kA]	-	18	25	40	-	25	40
(AC) 50-60 Hz 480/500/525 V	I _{cu} [kA]	-	6	7.5	12.5	-	-	10
(AC) 50-60 Hz 660/690 V	I _{cu} [kA]	-	-	-	6	-	-	4
(DC) 250 V - 2 poles in series	I _{cu} [kA]	-	12.5	20	25	-	25	25
Rated service short-circuit breaking capacity, (I _{cs})								
(AC) 50-60 Hz 220/230 V	I _{cs} [kA]	-	25	25	40	-	25	40
(AC) 50-60 Hz 380/415 V	I _{cs} [kA]	-	18	20	20	-	20	20
(AC) 50-60 Hz 480/500/525 V	I _{cs} [kA]	-	3	4	7.5	-	-	7.5
(AC) 50-60 Hz 660/690 V	I _{cs} [kA]	-	-	-	3	-	-	2
(DC) 250 V - 2 poles in series	I _{cs} [kA]	-	7	10	13	-	13	13
Rated short-circuit making capacity	I _{cm} [kA]	2.8	-	-	-	6	-	-
Rated short-time withstand current for 1s	I _{cw} [kA]	2	-	-	-	3	-	-
Category of use (EN 60947-2)	-	A				-	A	
Calibration temperature	-	50°C				-	50°C	
Derating 40°C	-	100%				-	100%	
50°C	-	100%				-	100%	
55°C	-	95%				-	94%	
60°C	-	93%				-	91%	
65°C	-	90%				-	88%	
Suitability for isolation	ok				ok			
Electric endurance in number of cycles	10000				10000			
Mechanical endurance in number of operations	20000				20000			
Operating temperature	-25 to +70°C				-25 to +70°C			
Storage temperature	-35 to +70°C				-35 to +70°C			
Power loss (at I _n for 3P)	[W]	39				60		
Reference standard	IEC 60947-3	IEC 60947-2						
Releases: switch	ok	-						
Releases: TM (thermomagnetic)	-	ok						
T fixed, M fixed	-	ok (1P)						
T adjustable, M fixed	-	ok (3/4 P)						
T adjustable, M adjustable	-	-						
Thermal adjustment value	-	0.63 to 1 x I _n						
Magnetic adjustment value	-	-						
Releases: LSI (electronic)	-	-						
Long delay	-	-						
Short delay	-	-						
Time delay	-	-						
Terminations								
Standard terminal type	cage				lugs			
Maximum terminal capacity	95 mm²				185 mm² (cage)			
Terminal width	mm	-				25		
Terminal shields	ok				ok			
Cage terminal	integrated				ok			
Extended connections	ok				ok			
Rear connections	no				ok			
Dimensions								
Height	mm	130			165			
Width	1P mm	-	25	-	-			
	2P mm	-	50	-	-			
	3P mm	75			105			
	4P mm	100			140			
Depth	mm	68			68			
Weight	1P kg	-	0.29	-	-			
	2P kg	-	0.48	-	-			
	3P kg	0.715			1.3			
	4P kg	0.95			1.6			

Product Frame		Add-on blocks		
		x160	x160	x250
Number of poles		3, 4	3, 4	4
Tripping Access		mechanical	mechanical	mechanical
Standards CE/EN 60947-2 appendix B		✓	✓	✓
Electrical Characteristics				
Max rated current (40) I_n A	I_n	125A	125 - 160A	160 - 250A
Rated service voltage U_e V AC (50/60Hz)	U_e	240 - 415V	240 - 415V	240 - 415V
Mechanical Characteristics				
Top and bottom supply		✓	✓	✓
For tripping, no additional external electrical sources		✓	✓	✓
Possible operating with two active phases		✓	✓	✓
Settings				
Sensitivity $I_{\Delta n}$	$I_{\Delta n}$ (A)	300mA	0.03, 0.1, 0.3, 1, 3, 6A	0.03, 0.1, 0.3, 1, 3, 6A
Time delay Δt	Δt (s)	inst.	inst., 0.06, 0.15, 0.3, 0.5, 1	inst., 0.06, 0.15, 0.3, 0.5, 1
Max. opening time	ms	10	10	10
Delay add-on block is not possible if $I_{\Delta n} = 30$ mA		-	✓	✓
Selective product		-	✓	✓
Mechanical test button		✓	✓	✓
Isolating test without cable removal		✓	✓	✓
Electrical test button		✓	✓	✓
Reset button		✓	✓	✓
Sealable setting button		-	✓	✓
Isolation level signaling by led 25 and 50%		-	✓	✓
I_n running signalisation by led		-	✓	✓
Residual default signaling contact		✓	✓	✓
Signaling contact 50% I_{dn}		-	✓	✓
Anti-transient	type AC	✓	✓	✓
Pulsating DC current	type A	✓	✓	✓
High immunity	type HI	✓	✓	✓
-25°C		✓	✓	✓
Accessories and connection				
Steel terminal cage (x3/x4)		✓	✓	accessories
Connection by lugs		-	-	✓
Extended connections (x4)		✓	✓	✓
Spreaders (x4)		✓	✓	✓
Terminal covers (3P/4P)		-	-	✓
Interphase barriers (x3)		✓	✓	✓
Rigid cables connection capacity mm²		4 - 95	4 - 95	35 - 185
Flexible cables connection capacity mm² (with terminal)		4 - 70	4 - 70	35 - 150
Tightening torque Nm		6	6	12
Copper bar (width) in mm		-	-	25
Mounting				
Clips on DIN rail		✓	✓	-
Fixed on mounting plate		-	-	✓
Fixation type		side	side	bottom
Mounting by customer		✓	✓	✓
Dimensions and weight				
Dimensions (WxHxD) in mm Side mounted 4P	W	100	100	140
	H	165	165	107.5
	D	95	95	85
Weight	3P	1.4	1.4	-
	4P	1.55	1.55	1.2

Technical drawing of a 3-phase 4-wire circuit breaker. The drawing includes a front view and a side view. The front view shows a rectangular unit with a central handle and a label '100A' and '3P+N'.

		220/240V AC IEC 60 947-2	380/415V AC IEC 60 947-2
HDA	I _{cu}	25 kA	18 kA
	I _{cs}	25 kA	18 kA
HHA	I _{cu}	35 kA	25 kA
	I _{cs}	25 kA	20 kA
HCA	I _{cm}	-	2.8 kA
	I _{cw}	-	2 kA - 1s



3



Ir (x ln)

89°01'

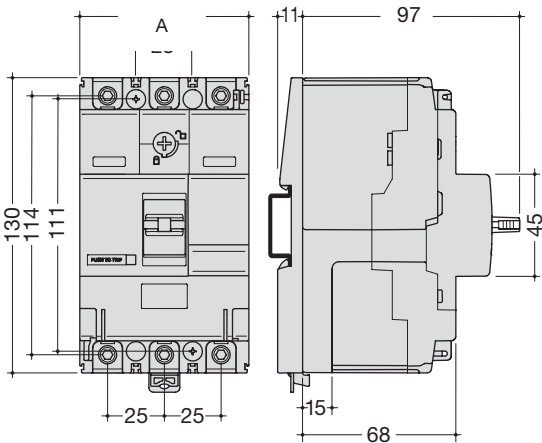
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Magnetic adjustment fixed $> 10 \times I_n$

I_n	16 - 50 A	63 - 80 A	100 - 125 A	160 A
I_{mag}	600 A	1000 A	1500 A	1600 A

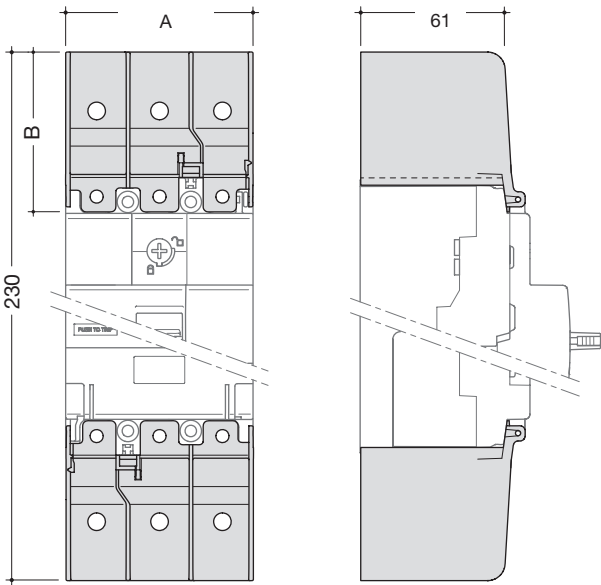
Dimensions

MCCB x160



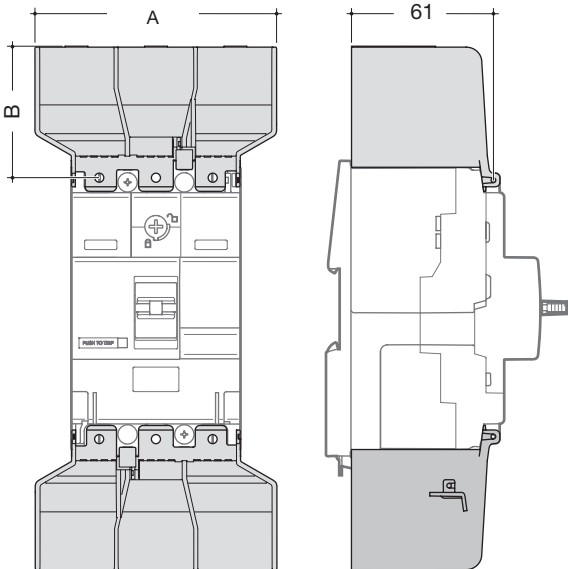
	A (mm)
1P	24.8
3P	74.5
4P	99.5

Terminal covers for extended straight connections



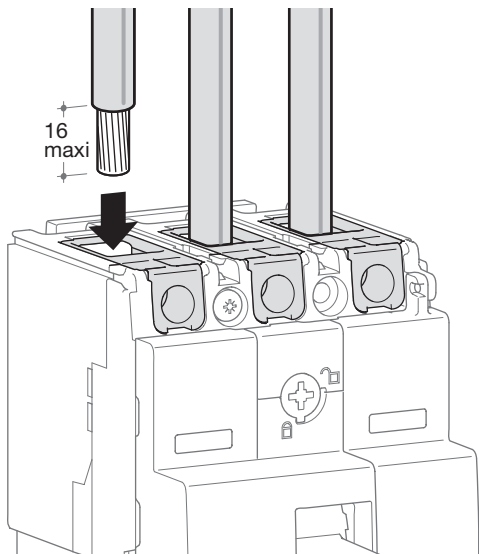
	A (mm)
1P	24.4
3P	74.5
4P	99.5

Terminal cover for extended spreader connections



	A (mm)
3P	106.5
4P	141.5

Connection with terminals



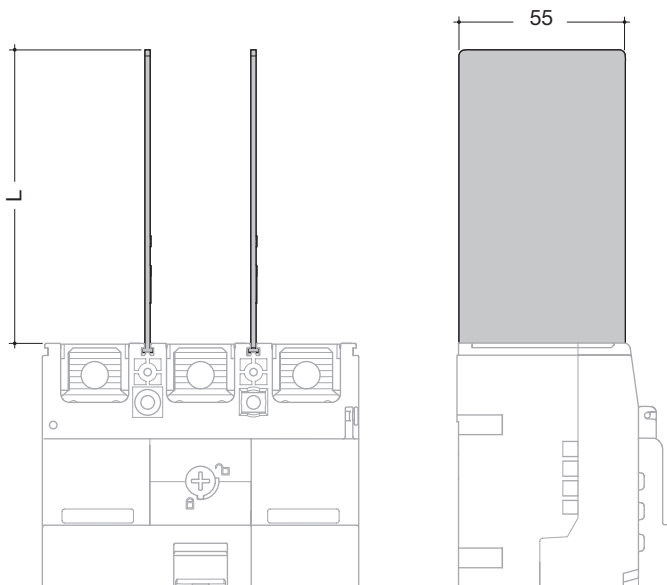
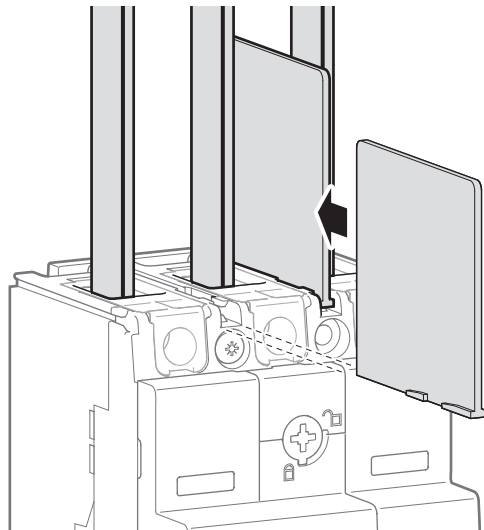
Terminals for copper conductors (standard)

	min. 6 mm ²	max. 70 mm ²
	min. 6 mm ²	max. 95 mm ²
	6 Nm	

Terminals for aluminium / copper conductors (accessory)
HYA005H, HYA006H

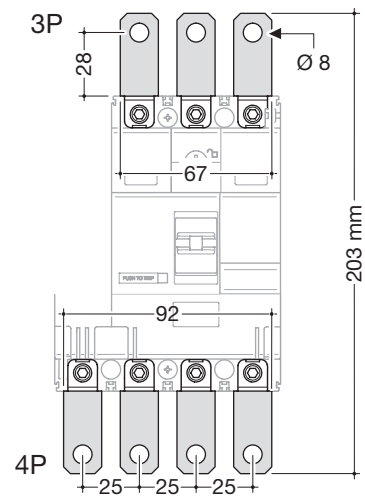
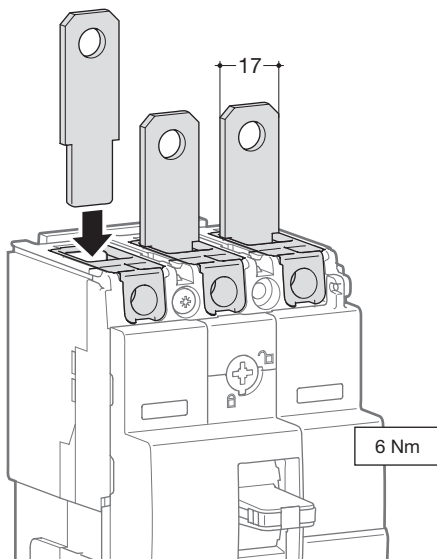
	min. 35 mm ²	max. 70 mm ²
	10 Nm	

Interphase barriers

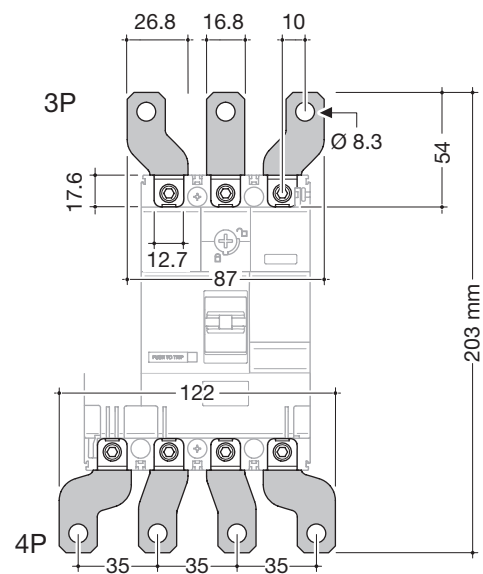
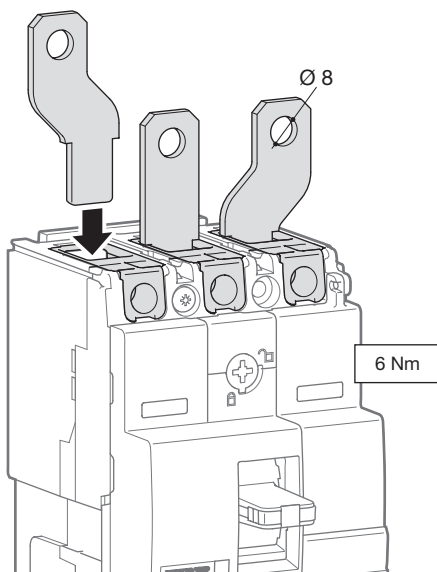


	L (mm)
HYA019H	50
HYB019H	97

Extended straight connections

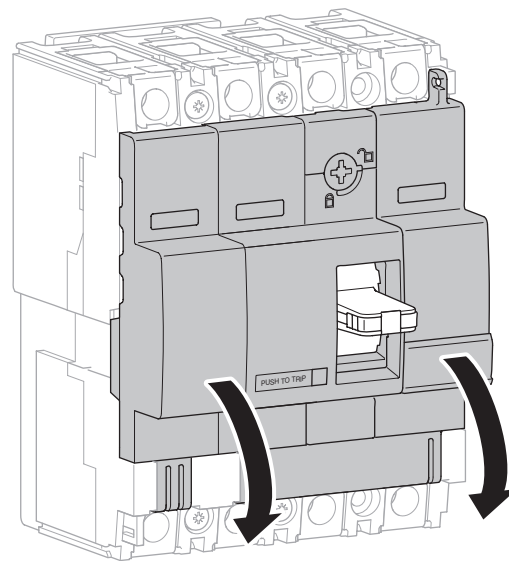
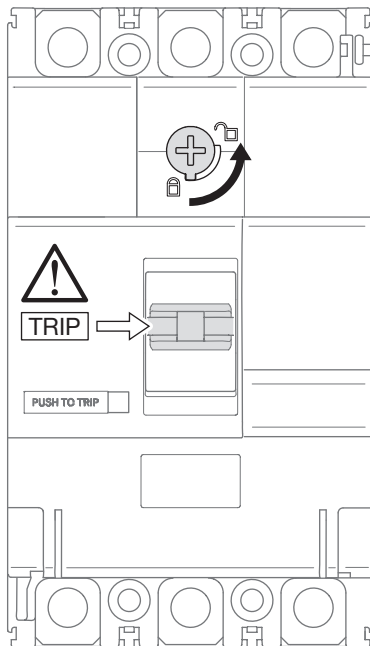


Extended spreader connections



Auxiliaries

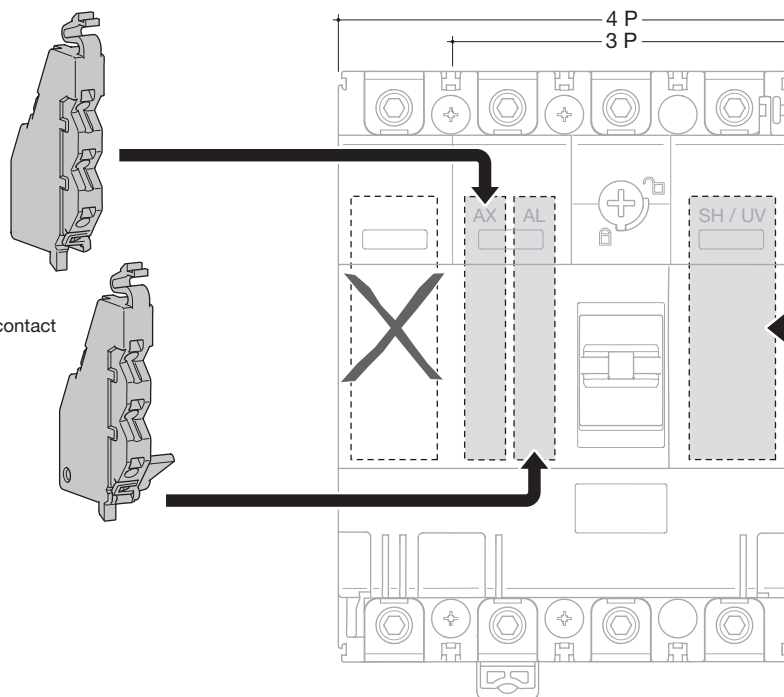
Auxiliaries for MCCBs and moulded case switches



Mounting combination for auxiliaries and releases

AX
Auxiliary contact

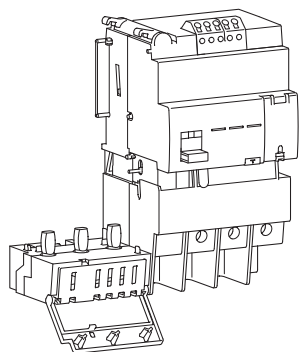
AL
Alarm contact



SH
Shunt trip

UV
Undervoltage release

DUVR
Delayed
undervoltage
release



When associated with MCCB, the add-on block provides an earth fault protection and protects against electrical shocks by direct or indirect contact.

The add-on blocks are protected against nuisance tripping caused by transient voltages. It's able to detect sinusoidal alternating currents and residual pulsating direct currents (A type ). It also avoids miss tripping (HI type - High Immunity).

Characteristics

Reset button :

Signals add-on block tripping and must be reset before switching on the installation.

Test button for RCD function :

Checks the electrical operating of the MCCB / Add-on block association.

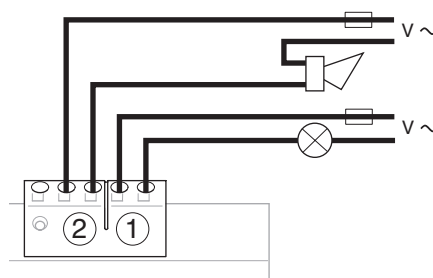
Mechanical test button :

Checks the mechanical operating of the MCCB / Add-on block association.

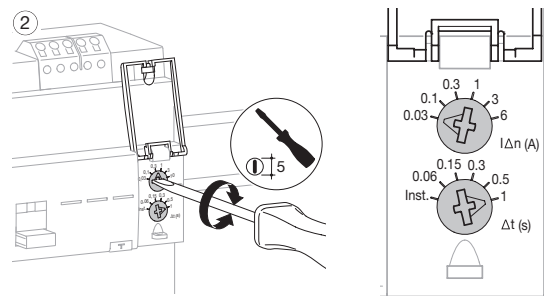
LED signaling residual current level in the installation:

25% (orange) and 50% (red) $I_{\Delta n}$; green light to signal correct operating.

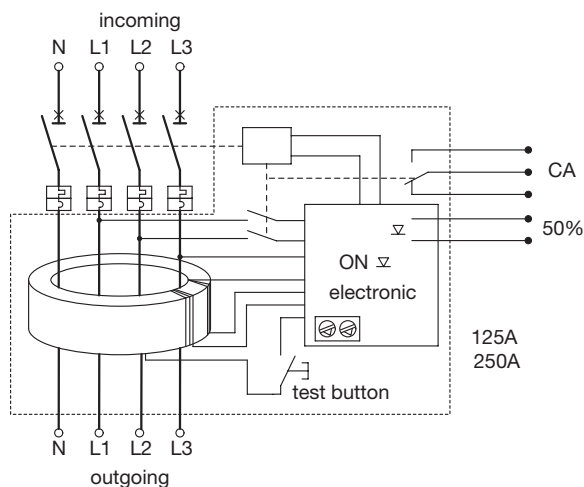
Remote tripping and advanced warning (50% $I_{\Delta n}$) signaling thanks to these contacts:



Earth leakage current ($I_{\Delta n}$) and delay (Δt) setting



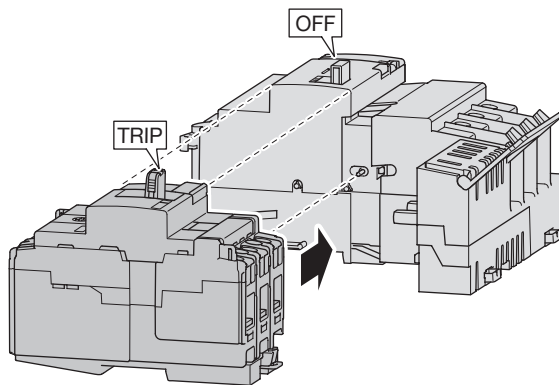
Add-on block operating



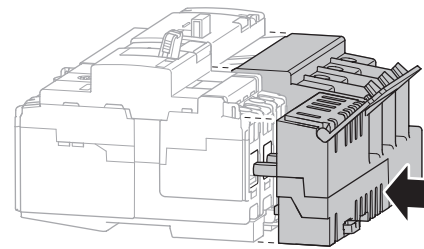
	$A (I_{\Delta n})$					
	0.03	0.1	0.3	1	3	6
Inst.	OK	OK	OK	OK	OK	OK
0.06	no	OK	OK	OK	OK	OK
0.15	no	OK	OK	OK	OK	OK
0.3	no	OK	OK	OK	OK	OK
0.5	no	OK	OK	OK	OK	OK
1	no	OK	OK	OK	OK	OK

Add-on block mounting

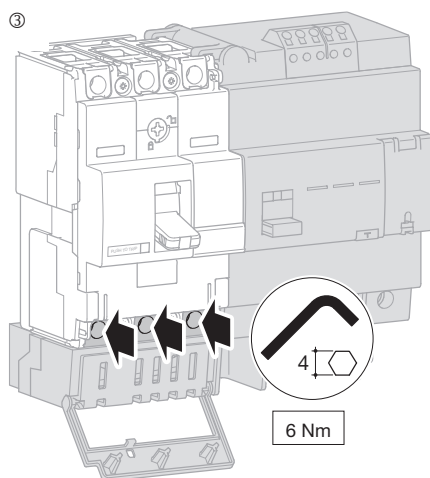
①



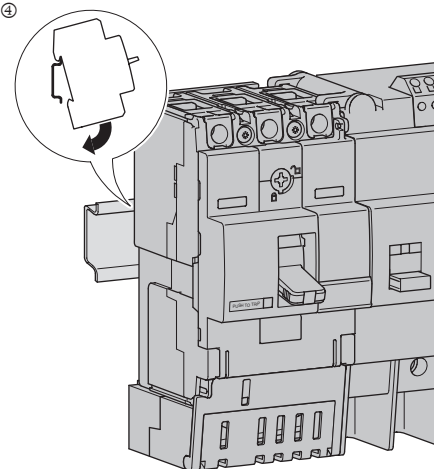
②



③



④

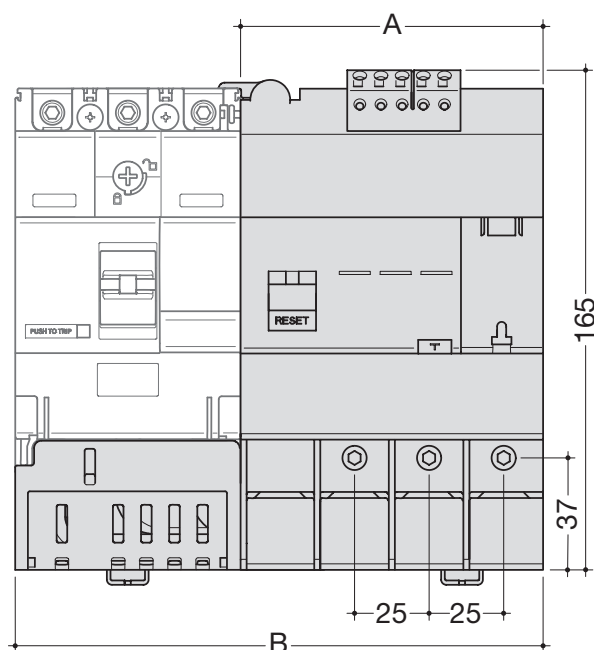


Exclusive drawer assembly system allows quick mounting and makes MCCB and add-on block association a complete monoblock unit.

Reinforced insulation connection (class II)

System avoids the omission of terminal tightening

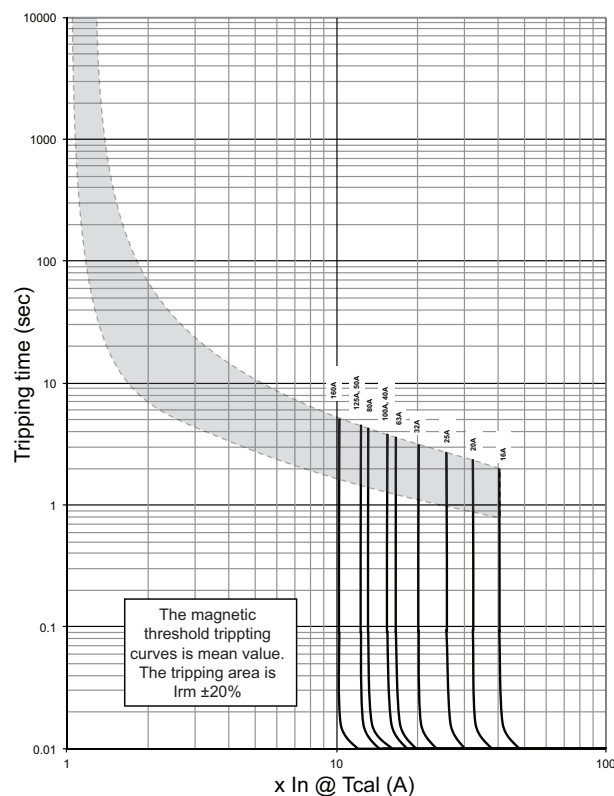
Dimensions



	3P	4P
A (mm)	100	100
B (mm)	174.5	199.5

Tripping curve

MCCB x160



MCCB Disconnection Data

Earth Fault Loop Impedance Data

Disconnection time 0.2s, 0.4s, 1s

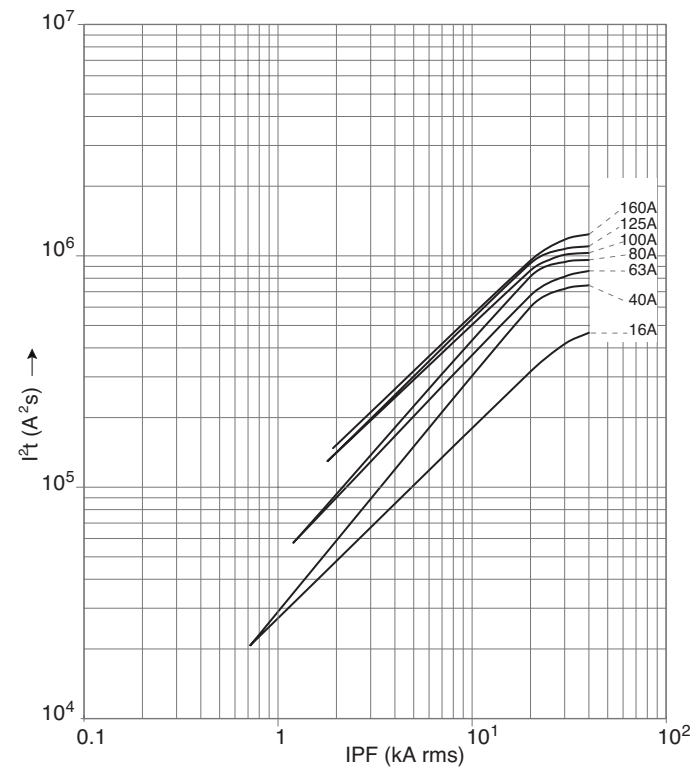
Device rating (A)	Instantaneous trip ($\times I_n$)	Instantaneous trip (A)	add 20% tolerance (I_a)	$Z_s = (230 \times 0.95) / I_a$
16	40.3	644.8	773.8	0.28
20	32.2	644.0	773	0.28
25	25.7	643	771	0.28
32	20.13	644.2	773.0	0.28
40	15.0	600.0	720.0	0.30
50	12.0	600.0	720.0	0.30
63	16.6	1045.8	1255.0	0.17
80	13.1	1048.0	1258	0.17
100	15.4	1540.0	1848.0	0.12
126	12.3	1538	1845.0	0.12
160	10.22	1635.2	1962.2	0.11

Disconnection time 5s

Device rating (A)	trip ($\times I_n$)	I_a (A)	$Z_s = (230 \times 0.95) / I_a$
16	10	160	1.37
20	10	200	1.09
25	10	250	0.87
32	10	320	0.68
40	10	400	0.55
50	10	500	0.44
63	10	630	0.35
80	10	800	0.27
100	10	1000	0.22
125	10	1250	0.17
160	10	1600	0.14

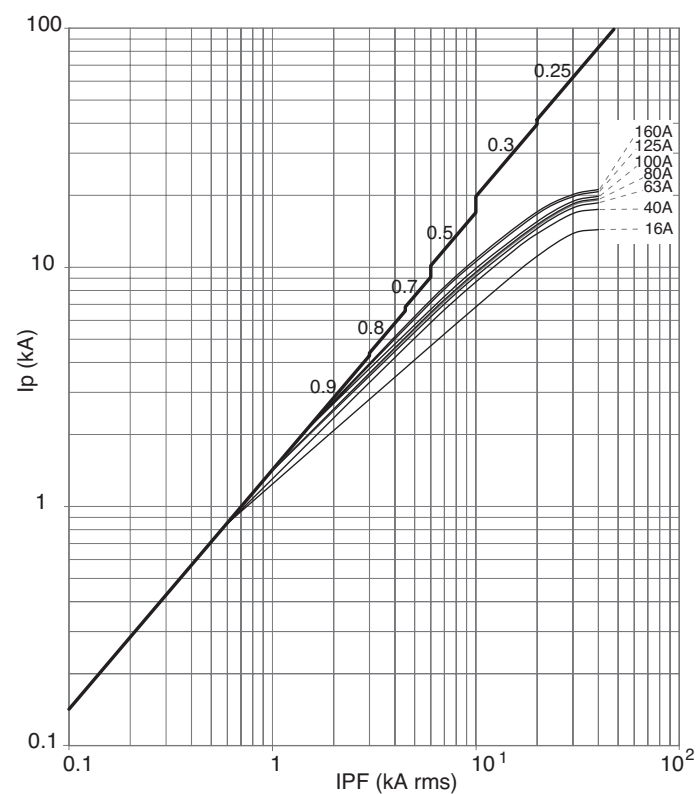
Thermal constraint curve at 400V (Let-through energy)

MCCB x160

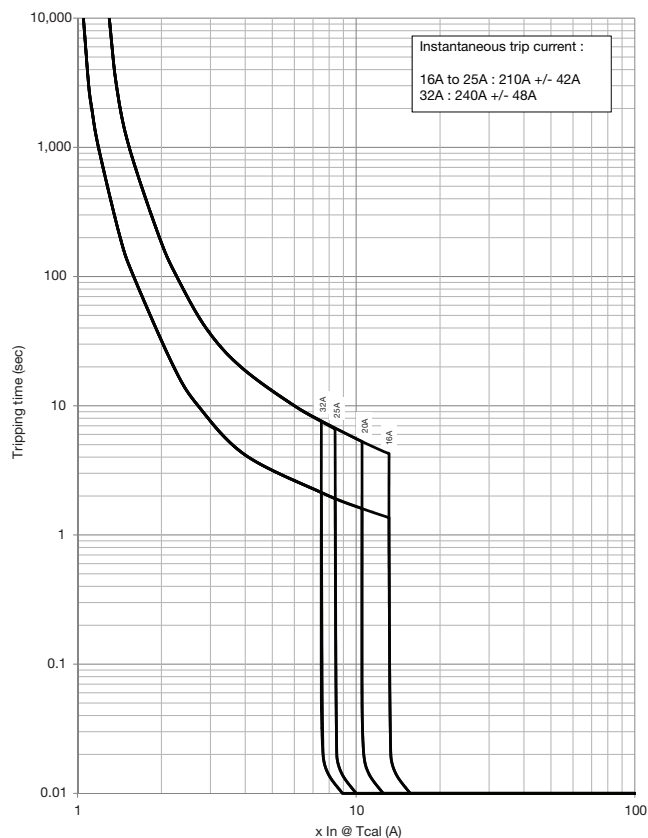


Current limiting curve at 400V (Let-through peak current)

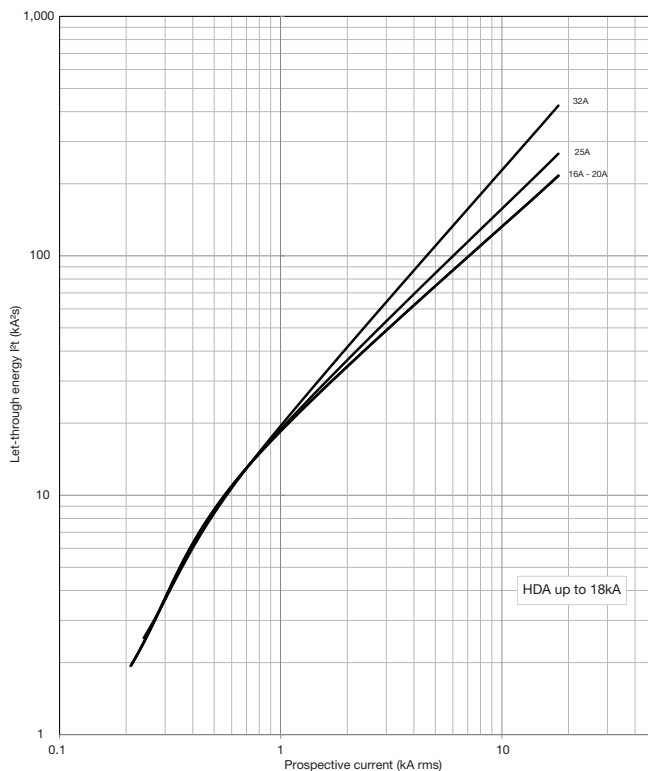
MCCB x160



Tripping Curve SP MCCB x160 16A - 32A



Thermal constraint curve at 230V (Let through energy)



The earth fault loop impedance requirements for larger devices can be calculated by the formula given in BS7671:2008

$$Z_s \leq \frac{230 \times C_{min}}{I_a}$$

Where $I_a = I_n$ of MCCB x Mag setting x 1.2

Earth Fault Loop Impedance Data To BS 7671:2018

Disconnection time 0.2s, 0.4s, 1s

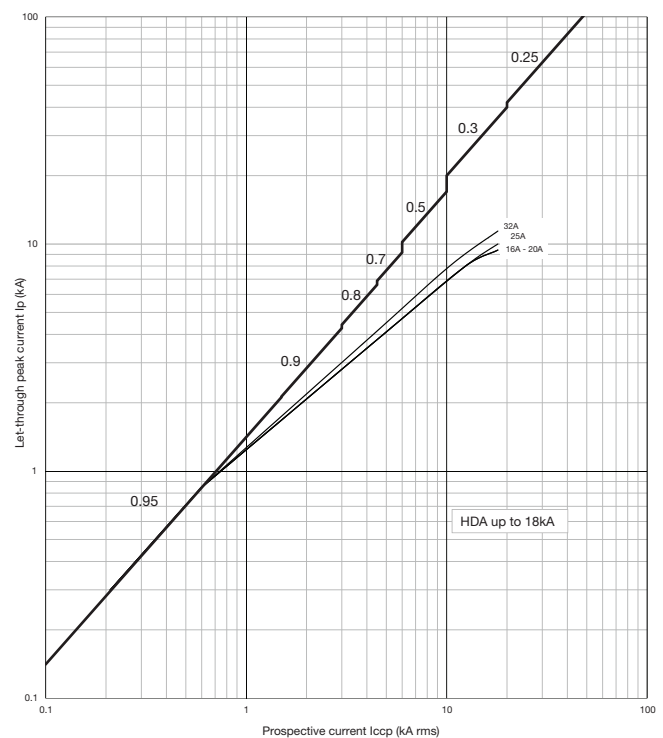
Device rating (A)	Instantaneous trip (xIn)	Instantaneous trip (A)	add 20% tolerance (Ia)	Zs = 230 x Cmin / Ia
16	13.0	210.0	252.0	0.87
20	10.5	210.0	252.0	0.87
25	8.5	210.0	252.0	0.87
32	7.5	240.0	288.0	0.76

Earth Fault Loop Impedance Data To BS 7671:2018

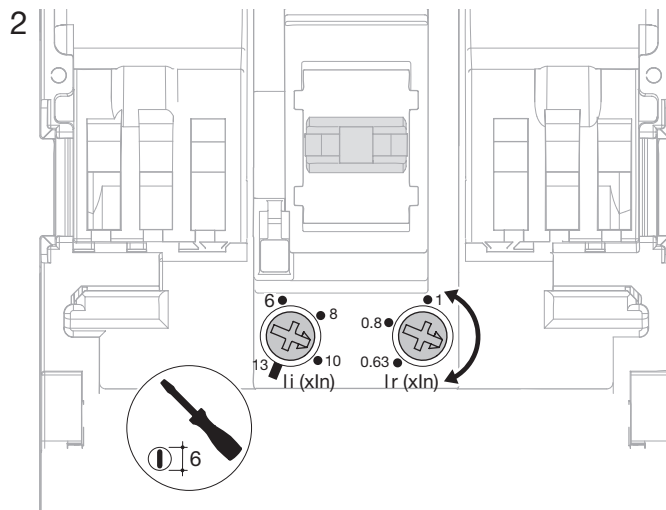
Disconnection time 5s

Device rating (A)	Instantaneous trip (xIn)	Instantaneous trip (A)	If Magnetic trip add 20% tolerance (Ia)	Zs = 230 x Cmin / Ia
16	11.0	176.0	176.0	1.24
20	10.5	210.0	210.0	0.99
25	8.5	212.5	255.0	0.86
32	7.5	240.0	288.0	0.76

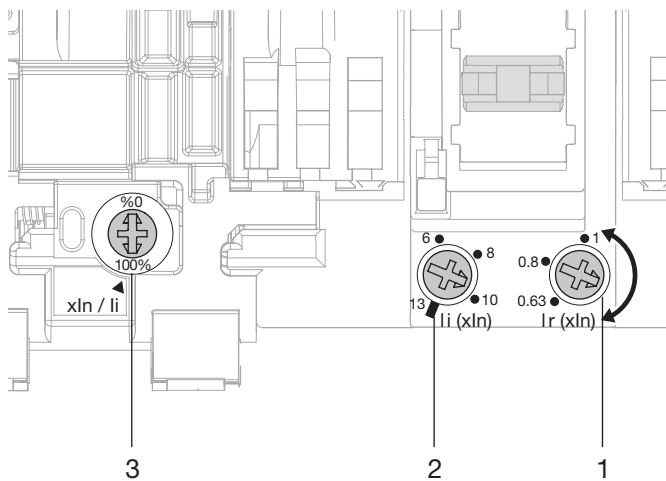
Current limiting curve at 230V (Let through peak current)



		220/240V AC IEC 60 947-2	380/415V AC IEC 60 947-2
HHB	Icu	35 kA	25 kA
	Ics	25 kA	20 kA
HNB	Icu	85 kA	40 kA
	Ics	40 kA	20 kA
HCB	Icm	-	9 kA
	Icw	-	3 kA - 1s

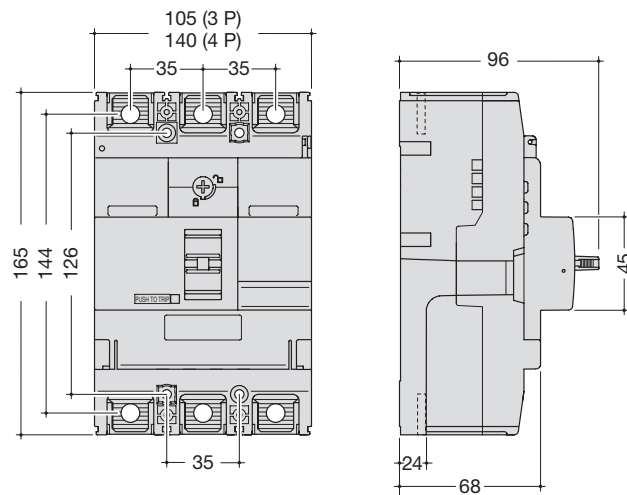


	100 - 200A	250A
$I_r (x I_n)$ 1	$0.63 - 0.8 - 1 \times I_n$	
$I_i (x I_n)$ 2	$6 - 8 - 10 - 13 \times I_n$	$5 - 7 - 9 - 11 \times I_n$
$x I_n / I_i$ 3	0 - 100%	
	0 - 60%	

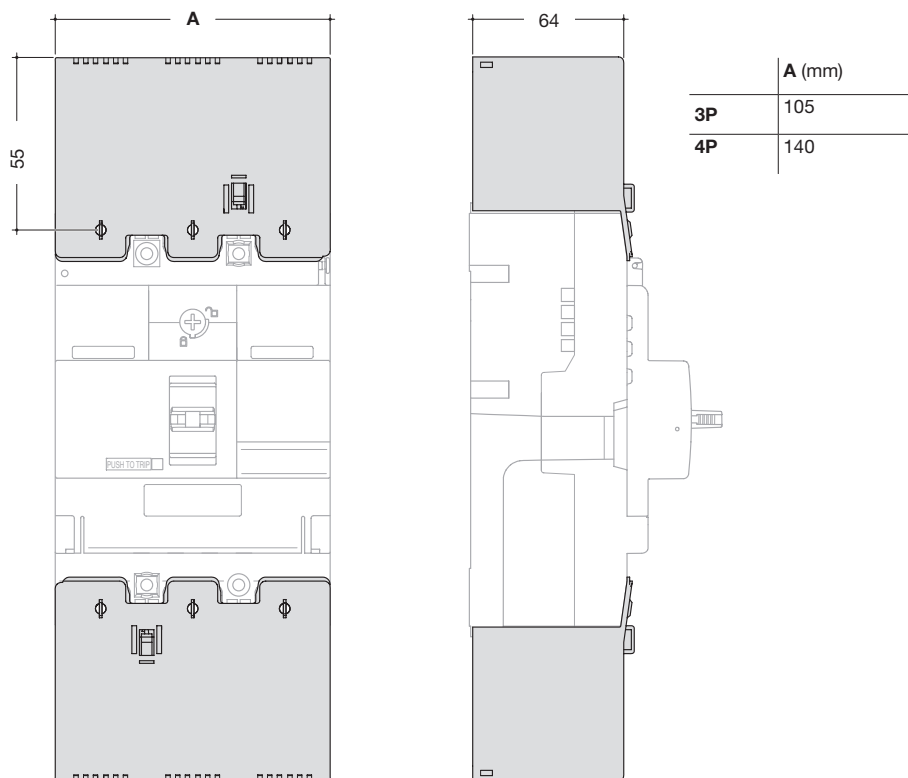


Dimensions

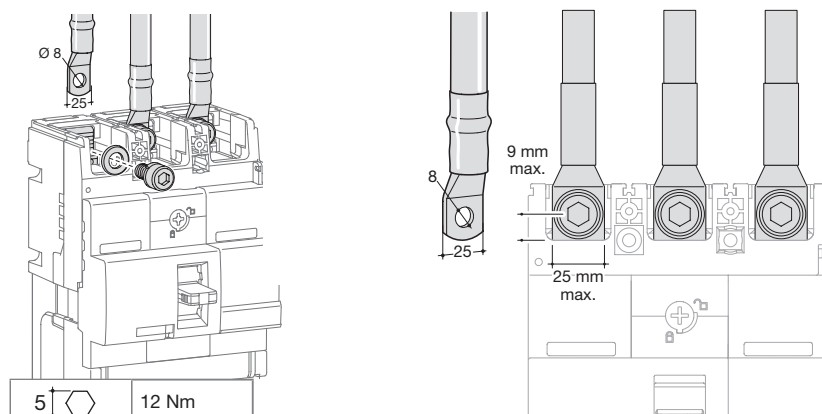
MCCB x250



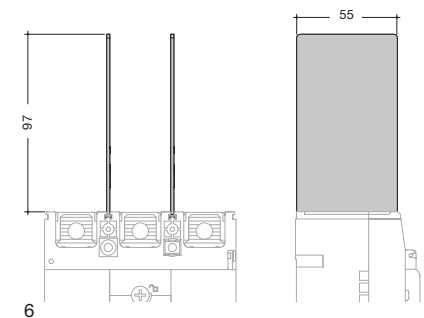
Terminal covers for extended straight connections



Connection with end lugs

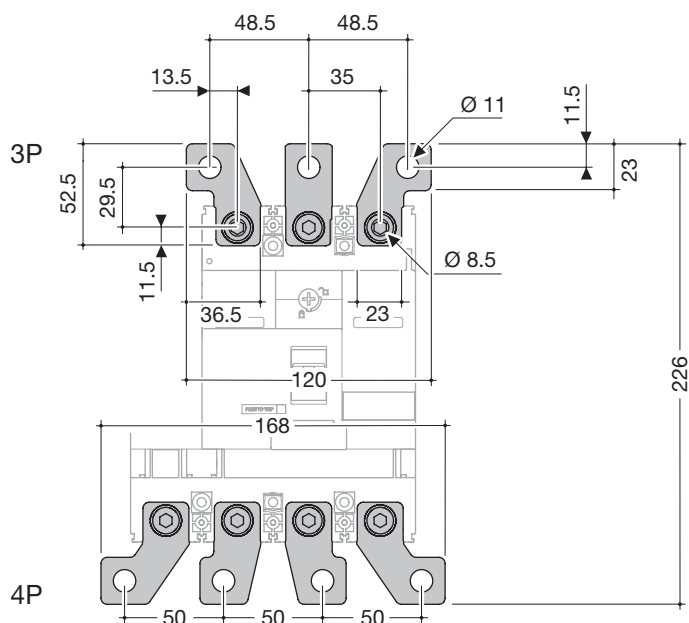
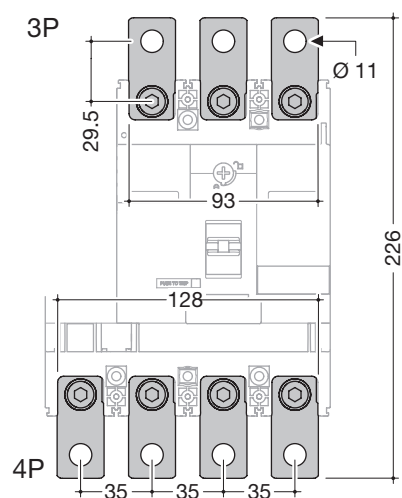
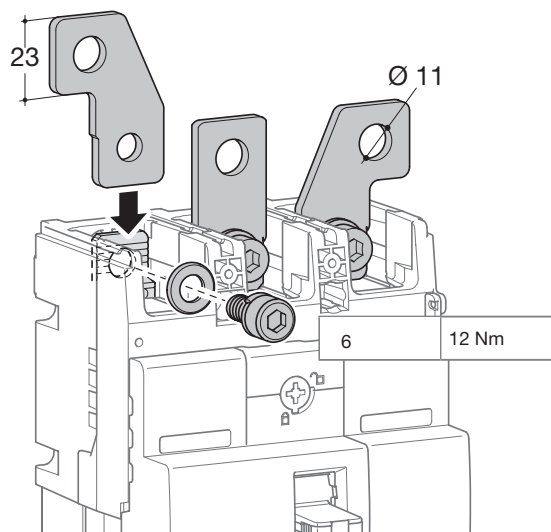
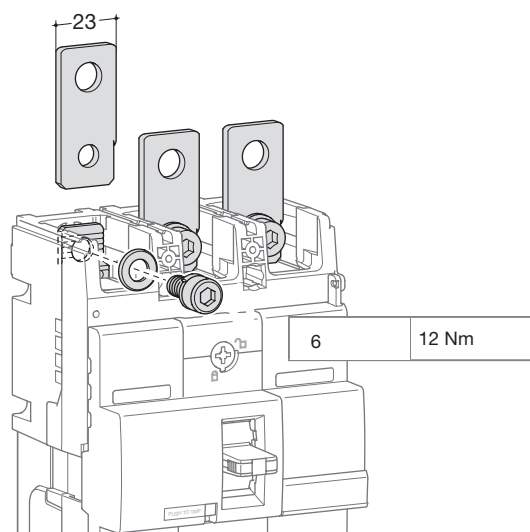


Interphase barriers



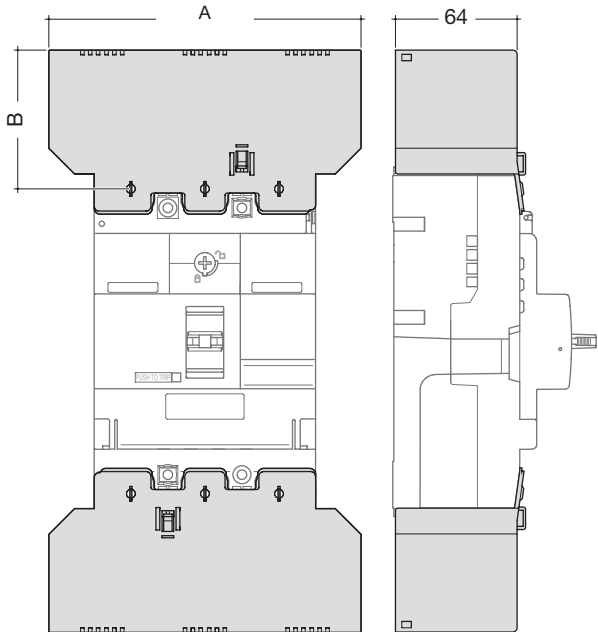
Connection

Extended straight and spreader connections



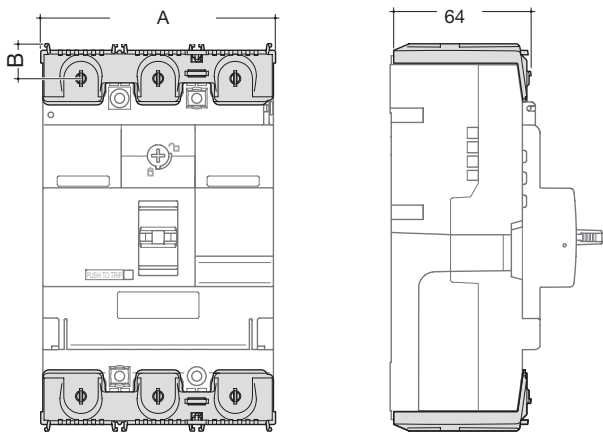
Accessories

Terminal cover for extended spreader connections



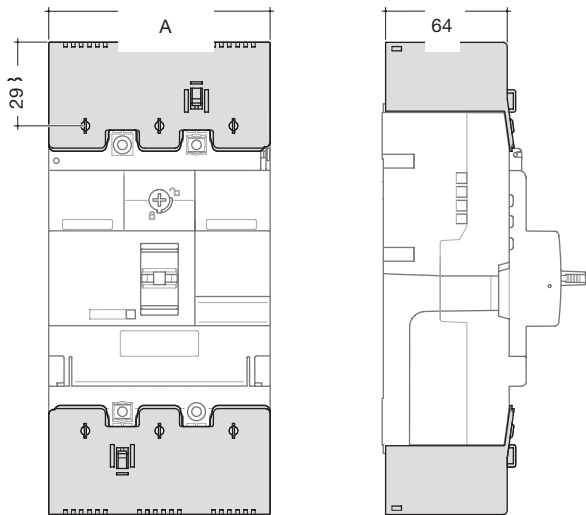
	A (mm)	B (mm)	C (mm)
3P	147.5	54.5	64
4P	196	54.5	64

Terminal cover for rear connections



	A (mm)
3P	105
4P	140

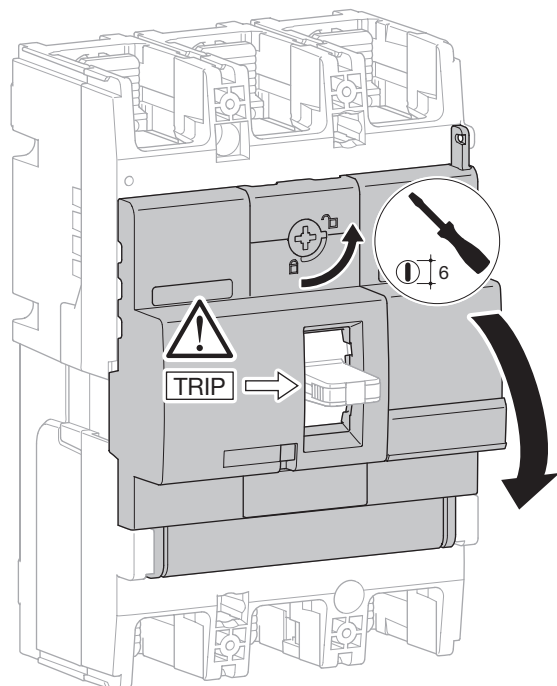
Terminal covers for collar terminals



	A (mm)
3P	105
4P	140

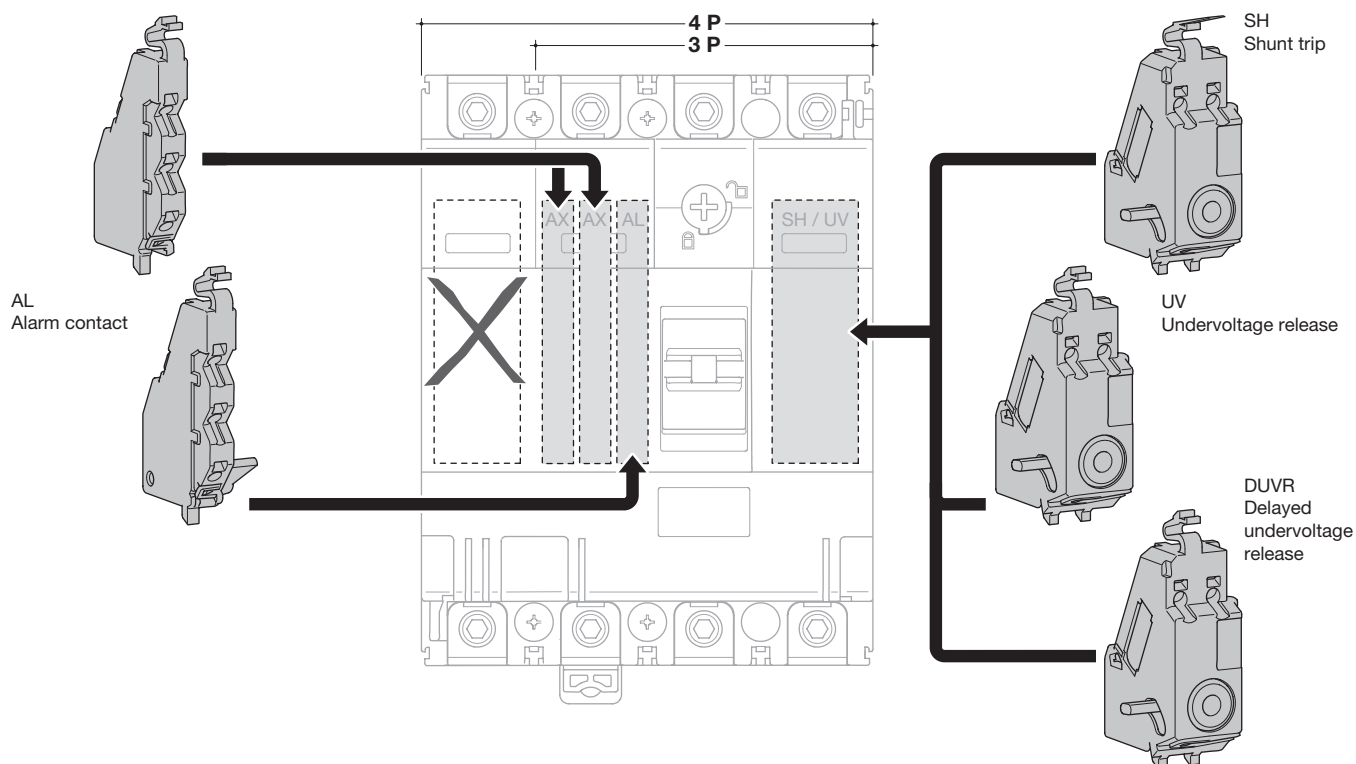
Auxiliaries

Auxiliaries for MCCBs and moulded case switches



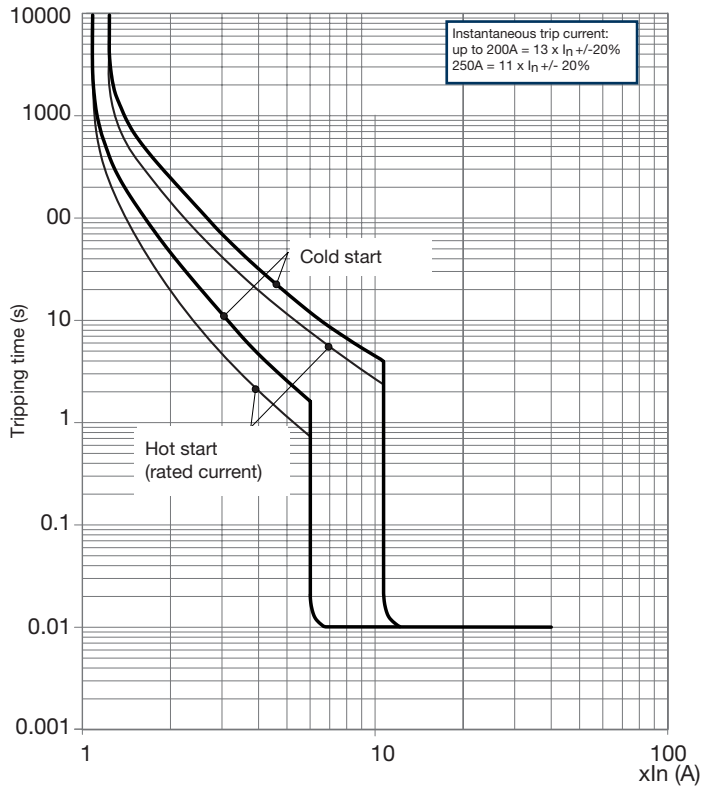
Mounting combination for auxiliaries and releases

AX
Auxiliary contact



Tripping curve

MCCB x250

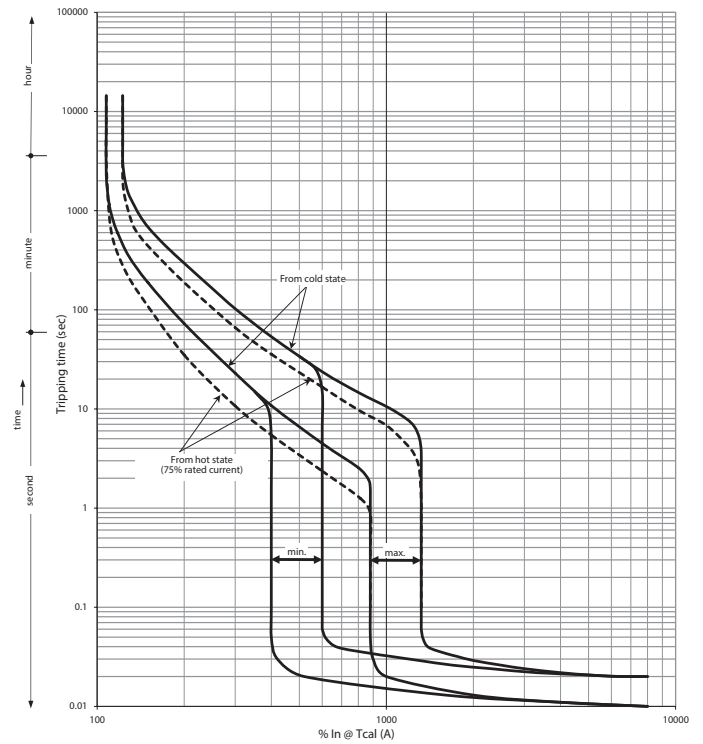


Earth fault loop impedance (Z_s) can be calculated from the formula
 $Z_s \leq \frac{230}{I_a} \times 0.95$

Where $I_a = I_n$ of MCCB x mag setting x 1.2

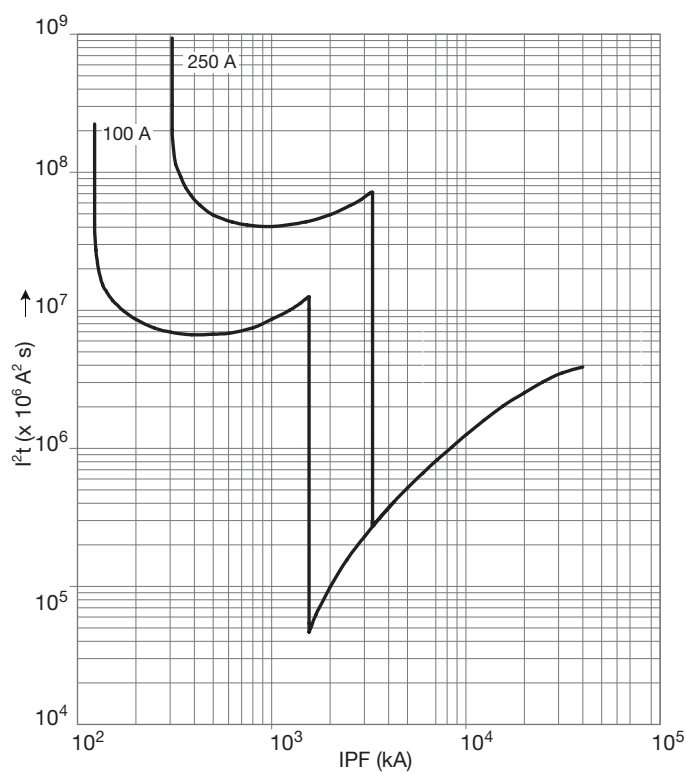
Tripping curve

MCCB h250 TM



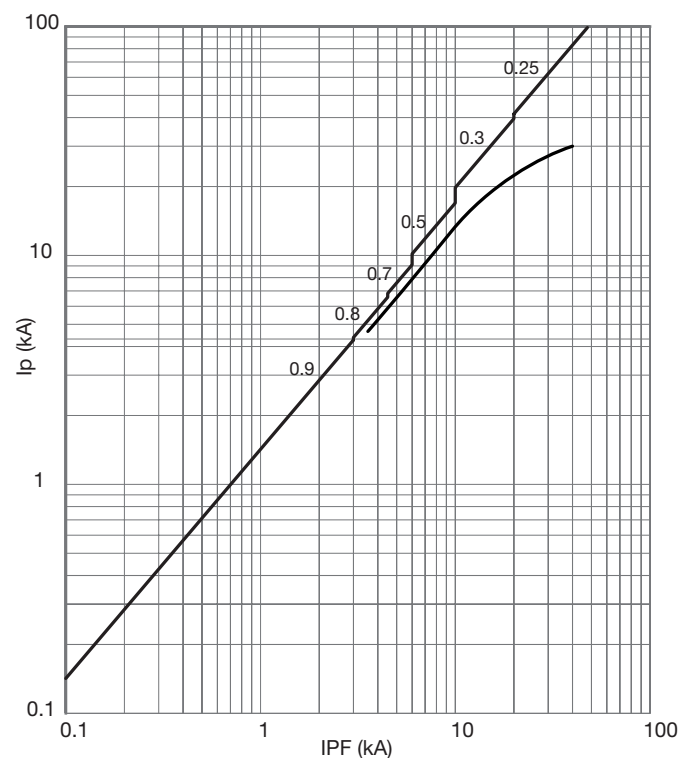
Thermal constraint curve at 400V (Let-through energy)

MCCB x250



Current limiting curve at 400V (Let-through peak current)

MCCB x250



		Upstream											
Max Values (kA)		Fuse BS 88											
Downstream	MTN B Curve	I _n (A)	10	16	20	25	32	40	45	50	63	80	100
	6A	80	80	80	80	80	80	80	80	80	80	6	6
	10A	80	80	80	80	80	80	80	80	80	80	6	6
	16A	-	80	80	80	80	80	80	80	80	80	42	6
	20A	-	-	80	80	80	80	80	80	80	80	42	6
	25A	-	-	-	80	80	80	80	80	80	80	42	6
	32A	-	-	-	-	80	80	80	80	80	80	42	6
	40A	-	-	-	-	-	80	80	80	80	80	42	6
	50A	-	-	-	-	-	-	-	80	80	80	42	6
	63A	-	-	-	-	-	-	-	-	80	80	42	23
	NBN B Curve	6A	80	80	80	80	80	80	80	80	80	80	15
	10A	80	80	80	80	80	80	80	80	80	80	80	15
	16A	-	80	80	80	80	80	80	80	80	80	80	80
	20A	-	-	80	80	80	80	80	80	80	80	80	80
	25A	-	-	-	80	80	80	80	80	80	80	80	80
	32A	-	-	-	-	80	80	80	80	80	80	80	80
	40A	-	-	-	-	-	80	80	80	80	80	80	80
	50A	-	-	-	-	-	-	-	80	80	80	80	80
	63A	-	-	-	-	-	-	-	-	80	80	80	80
	NCN C Curve	0,5A	80	15	15	15	15	15	15	15	15	15	15
	1A	80	80	80	80	80	80	80	80	15	15	15	15
	2A	80	80	80	80	80	80	80	80	15	15	15	15
	3A	80	80	80	80	80	80	80	80	80	80	15	15
	4A	80	80	80	80	80	80	80	80	80	80	15	15
	6A	80	80	80	80	80	80	80	80	80	80	80	15
	10A	80	80	80	80	80	80	80	80	80	80	80	80
	16A	-	80	80	80	80	80	80	80	80	80	80	80
	20A	-	-	80	80	80	80	80	80	80	80	80	80
	25A	-	-	-	80	80	80	80	80	80	80	80	80
	32A	-	-	-	-	80	80	80	80	80	80	80	80
	40A	-	-	-	-	-	80	80	80	80	80	80	80
	50A	-	-	-	-	-	-	-	80	80	80	80	80
	63A	-	-	-	-	-	-	-	-	80	80	80	80
	NDN D Curve	0,5A	80	15	15	15	15	15	15	15	15	15	15
	1A	80	80	80	80	80	80	80	80	15	15	15	15
	2A	80	80	80	80	80	80	80	80	15	15	15	15
	3A	80	80	80	80	80	80	80	80	80	80	15	15
	4A	80	80	80	80	80	80	80	80	80	80	15	15
	6A	80	80	80	80	80	80	80	80	80	80	80	15
	10A	80	80	80	80	80	80	80	80	80	80	80	80
	16A	-	80	80	80	80	80	80	80	80	80	80	80
	20A	-	-	80	80	80	80	80	80	80	80	80	80
	25A	-	-	-	80	80	80	80	80	80	80	80	80
	32A	-	-	-	-	80	80	80	80	80	80	80	80
	40A	-	-	-	-	-	80	80	80	80	80	80	80
	50A	-	-	-	-	-	-	-	80	80	80	80	80
	63A	-	-	-	-	-	-	-	-	80	80	80	80
	HMC / HMF C Curve	80A	-	-	-	-	-	-	-	-	-	80	80
	100A	-	-	-	-	-	-	-	-	-	-	-	80
	125A	-	-	-	-	-	-	-	-	-	-	-	-
	HMD D Curve	80A	-	-	-	-	-	-	-	-	-	80	80
	100A	-	-	-	-	-	-	-	-	-	-	-	80
	125A	-	-	-	-	-	-	-	-	-	-	-	-

Max Values (kA)		Upstream												
		Fuse BS 88												
Downstream		In	10A	16A	20A	25A	32A	40A	45A	50A	63A	80A	100A	
	ADA3**G B Curve, 6kA, Type A	6A	80	80	80	80	80	80	80	80	80	6	6	
	10A	80	80	80	80	80	80	80	80	80	80	42	6	
	16A	-	80	80	80	80	80	80	80	80	80	42	6	
	20A	-	-	80	80	80	80	80	80	80	80	42	6	
	32A	-	-	-	-	80	80	80	80	80	80	42	6	
	40A	-	-	-	-	-	80	80	80	80	80	42	6	
	45A	-	-	-	-	-	-	80	80	80	80	42	6	
	ADA1**U B Curve, 10kA, Type A	6A	80	80	80	80	80	80	80	80	80	80	80	10
	10A	80	80	80	80	80	80	80	80	80	80	80	10	
	16A	-	80	80	80	80	80	80	80	80	80	80	10	
	20A	-	-	80	80	80	80	80	80	80	80	80	10	
	25A	-	-	-	80	80	80	80	80	80	80	80	10	
	32A	-	-	-	-	80	80	80	80	80	80	80	80	
	40A	-	-	-	-	-	80	80	80	80	80	80	80	
	45A	-	-	-	-	-	-	80	80	80	80	80	80	
	ADA1**U C Curve, 6kA, Type A	6A	80	80	80	80	80	80	80	80	80	80	80	10
	10A	80	80	80	80	80	80	80	80	80	80	80	10	
	16A	-	-	80	80	80	80	80	80	80	80	80	10	
	20A	-	-	-	80	80	80	80	80	80	80	80	10	
	25A	-	-	-	-	80	80	80	80	80	80	80	80	
	32A	-	-	-	-	-	80	80	80	80	80	80	80	
40A	-	-	-	-	-	-	80	80	80	80	80	80		

Max Values (kA)		Upstream																									
		NBN B Curve												NCN C Curve													
		I _n (A)	6	10	13	16	20	25	32	40	50	63	0.5	1	2	3	4	6	10	13	16	20	25	32	40	50	63
Downstream	ADA1**U B Curve, 10kA Type A	6A	15	15	15	15	15	15	15	15	15	15	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15
		10A	-	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15
		16A	-	-	-	15	15	15	15	15	15	15	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15
		20A	-	-	-	-	15	15	15	15	15	15	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15
		25A	-	-	-	-	-	15	15	15	15	15	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15
		32A	-	-	-	-	-	-	15	15	15	15	15	-	-	-	-	-	-	-	-	-	15	15	15	15	15
		40A	-	-	-	-	-	-	-	15	15	15	15	-	-	-	-	-	-	-	-	-	-	15	15	15	15
		45A	-	-	-	-	-	-	-	-	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-	15	15
	ADA1**U C Curve, 10kA Type A	6A	15	15	15	15	15	15	15	15	15	15	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15
		10A	-	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15
		16A	-	-	-	15	15	15	15	15	15	15	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15
		20A	-	-	-	-	15	15	15	15	15	15	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15
		25A	-	-	-	-	-	15	15	15	15	15	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15
		32A	-	-	-	-	-	-	15	15	15	15	15	-	-	-	-	-	-	-	-	-	15	15	15	15	15
		40A	-	-	-	-	-	-	-	15	15	15	15	-	-	-	-	-	-	-	-	-	-	15	15	15	15
		45A	-	-	-	-	-	-	-	-	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-	15	15

Max Values (kA)		Upstream																							
		NDN D Curve															HMB B Curve			HMC / HMF C Curve			HMD D Curve		
	I _n (A)	0.5	1	2	3	4	6	10	13	16	20	25	32	40	50	63	80	100	125	80	100	125	80	100	125
Downstream	ADA1**U B Curve, 10kA Type A	6A	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		10A	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		16A	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		20A	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		25A	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15
		32A	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15
		40A	-	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15
		45A	-	-	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15
	ADA1**U C Curve, 10kA, Type A	6A	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		10A	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		16A	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		20A	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		25A	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15	15
		32A	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15	15
		40A	-	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15	15
		45A	-	-	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	15	15	15	15	15	15

Max Values (kA)		Upstream		
		NKN / NBN / NCN / NDN	HMC / HMF C Curve	HMD D Curve
		15kA	15kA	15kA
Downstream	ARC9*** B Curve	6kA	15	12
	ARC9*** C Curve	6kA	15	12
	ARC5*** B Curve	10kA	15	15
	ARC5*** C Curve	10kA	15	15

Downstream	Max Values (kA)	Upstream										
		x160			x250		H250 TM		H250 TM+		H250 LSI	
		18kA	25kA	40kA	25kA	40kA	25kA	50kA	50kA	70kA	50kA	70kA
		TM			TM		TM		TM+		LSI	
	NBN /NCN / NDN	18	20	40	25	40	25	50	23	50	23	50
	HMC C Curve	18	25	40	25	40	25	50	23	50	23	50
	HMD D Curve	18	25	40	25	40	25	50	23	50	23	50

Downstream	Max Values (kA)	Upstream														
		HDA x160 18 / 25kA												x250 25 / 40kA		
		In	16	20	25	32	40	50	63	80	100	125	160	100A	125A	160A
		200A	250A													
RCBO - ADA1**U B Curve, 10kA Type A	6A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	10A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	16A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	20A	-	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	25A	-	-	18	18	18	18	18	18	18	18	18	18	13	13	13
	32A	-	-	-	18	18	18	18	18	18	18	18	18	13	13	13
	40A	-	-	-	-	18	18	18	18	18	18	18	18	13	13	13
	45A	-	-	-	-	-	18	18	18	18	18	18	18	13	13	13
	6A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	10A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
RCBO - ADA1**U C Curve, 10kA, Type A	16A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	20A	-	18	18	18	18	18	18	18	18	18	18	18	13	13	13
	25A	-	-	18	18	18	18	18	18	18	18	18	18	13	13	13
	32A	-	-	-	18	18	18	18	18	18	18	18	18	13	13	13
	40A	-	-	-	-	18	18	18	18	18	18	18	18	13	13	13
	45A	-	-	-	-	-	18	18	18	18	18	18	18	13	13	13
	6A	18	18	18	18	18	18	18	18	18	18	18	18	13	13	13

Max Values (kA)			Upstream															
			HDA / HHA x160 TM		HHB / HNB x250 TM		HHG / HNG / HEG h250 TM			HNC / HEC h250 LSI		HND / HED h630 LSI		HNE / HEE h1000 LSI		HNF / HEF h1600 LSI		
			18kA	25kA	25kA	40kA	25kA	50kA	65kA	50kA	70kA	50kA	70kA	50kA	70kA	50kA	70kA	
Downstream	HDA / HHA x160 TM	18kA	-	25kA	25kA	40kA	25kA	40kA	40kA	40kA	40kA	40kA	40kA	40kA	40kA	40kA	40kA	
		25kA	-	-	-	40kA	-	50kA	65kA	50kA	70kA	50kA	50kA	50kA	50kA	50kA	50kA	
	HHB / HNB x250 TM	25kA	-	-	-	40kA	-	50kA	65kA	50kA	70kA	50kA	50kA	50kA	50kA	50kA	50kA	
		40kA	-	-	-	-	-	50kA	65kA	50kA	70kA	50kA	70kA	50kA	70kA	50kA	50kA	
	HHG / HNG / HEG h250 TM	25kA	-	-	-	40kA	-	50kA	65kA	50kA	70kA	50kA	50kA	50kA	50kA	50kA	50kA	
		50kA	-	-	-	-	-	-	65kA	-	70kA	-	70kA	-	70kA	-	70kA	
		65kA	-	-	-	-	-	-	-	-	70kA	-	70kA	-	70kA	-	70kA	
	HNC / HEC h250 LSI	50kA	-	-	-	-	-	-	-	-	70kA	-	70kA	-	70kA	-	70kA	
		70kA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	HND / HED h630 LSI	50kA	-	-	-	-	-	-	-	-	-	-	70kA	-	70kA	-	70kA	
		70kA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	HNE / HEE h1000 LSI	50kA	-	-	-	-	-	-	-	-	-	-	-	-	-	70kA	-	70kA
		70kA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HNF / HEF h1600 LSI	50kA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70kA
70kA		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Max Values (kA)		Upstream										
		Fuse BS88										
I _n		10A	16A	20A	25A	32A	40A	45A	50A	63A	80A	100A
MTN B Curve	6A	0.20	0.20	0.30	0.40	0.60	1.30	1.80	2.50	4.00	T	T
	10A	-	0.20	0.30	0.40	0.50	1.10	1.50	2.10	3.30	T	T
	16A	-	-	0.30	0.30	0.40	0.90	1.20	1.70	2.70	5.30	T
	20A	-	-	-	0.30	0.40	0.80	1.10	1.50	2.30	4.70	T
	25A	-	-	-	-	0.40	0.70	0.90	1.30	2.10	4.10	T
	32A	-	-	-	-	-	-	0.50	0.70	1.10	2.20	T
	40A	-	-	-	-	-	-	-	0.90	1.50	2.90	T
	50A	-	-	-	-	-	-	-	-	1.30	2.50	T
NBN B curve	6A	-	-	-	-	-	-	-	-	-	2.10	5.30
	6A	-	-	-	-	-	0.80	1.10	1.60	2.80	6.40	T
	10A	-	-	-	-	-	0.70	1.00	1.40	2.40	5.10	T
	16A	-	-	-	-	-	0.60	0.80	1.10	1.90	4.10	13.60
	20A	-	-	-	-	-	0.50	0.70	1.00	1.70	3.60	11.00
	25A	-	-	-	-	-	-	0.60	0.90	1.50	3.10	9.00
	32A	-	-	-	-	-	-	0.60	0.80	1.30	2.70	7.40
	40A	-	-	-	-	-	-	-	0.70	1.10	2.30	6.10
NCN C curve	50A	-	-	-	-	-	-	-	0.60	1.00	1.90	5.10
	63A	-	-	-	-	-	-	-	-	-	1.60	4.30
	0,5A	8.70	T	T	T	T	T	T	T	T	T	T
	1A	-	-	-	-	0.90	3.40	6.50	T	T	T	T
	2A	-	-	-	-	0.70	2.70	4.80	T	T	T	T
	3A	-	-	-	-	0.50	1.50	2.20	3.30	6.20	T	T
	4A	-	-	-	-	-	1.30	2.00	3.00	5.50	T	T
	6A	-	-	-	-	-	1.00	1.40	1.90	3.10	6.50	T
NDN D curve	10A	-	-	-	-	-	0.80	1.10	1.50	2.20	4.00	11.40
	16A	-	-	-	-	-	0.70	1.00	1.20	1.90	3.40	8.40
	20A	-	-	-	-	-	0.70	0.90	1.10	1.70	3.10	7.40
	25A	-	-	-	-	-	0.60	0.80	1.00	1.60	2.90	6.70
	32A	-	-	-	-	-	-	-	0.90	1.40	2.70	6.20
	40A	-	-	-	-	-	-	-	-	1.30	2.40	5.70
	50A	-	-	-	-	-	-	-	-	-	1.90	4.80
	63A	-	-	-	-	-	-	-	-	-	-	4.40
MTN B Curve	0,5A	12.70	T	T	T	T	T	T	T	T	T	T
	1A	-	-	-	0.50	1.00	3.40	5.90	T	T	T	T
	2A	-	-	-	-	0.90	3.00	5.10	T	T	T	T
	3A	-	-	-	-	0.70	1.80	2.70	3.90	7.30	T	T
	4A	-	-	-	-	0.50	1.30	2.10	3.10	5.60	T	T
	6A	-	-	-	-	-	1.00	1.40	1.80	2.90	5.60	T
	10A	-	-	-	-	-	0.90	1.20	1.50	2.30	4.30	14.80
	16A	-	-	-	-	-	0.70	1.00	1.30	2.00	3.60	8.90
	20A	-	-	-	-	-	-	0.90	1.10	1.70	3.20	7.80
	25A	-	-	-	-	-	-	-	1.00	1.50	2.90	7.00
	32A	-	-	-	-	-	-	-	-	1.30	2.50	5.90
	40A	-	-	-	-	-	-	-	-	-	2.20	5.10
	50A	-	-	-	-	-	-	-	-	-	-	4.20
63A	-	-	-	-	-	-	-	-	-	-	-	

		Upstream										
Max Values (kA)		I _n	Fuse BS88									
			10A	16A	20A	25A	32A	40A	50A	63A	80A	100A
Downstream	ADA3**G B Curve, 6kA, 30mA Type A	6A	0.10	0.20	0.30	0.40	0.50	1.00	1.60	3.00	T	T
		10A	-	0.20	0.30	0.40	0.50	0.90	1.50	2.70	6.00	T
		16A		-	0.20	0.30	0.50	0.90	1.40	2.30	4.80	T
		20A				0.30	0.40	0.80	1.30	2.10	4.30	T
		32A					-	0.60	1.10	1.50	3.10	T
		40A						-	1.00	1.40	2.80	T
		45A							1.10	1.60	2.90	T
	ADA1**U B Curve, 10kA, 30mA Type A	6A	0.10	0.20	0.30	0.40	0.50	1.00	1.60	3.00	7.10	T
		10A	-	0.20	0.30	0.40	0.50	0.90	1.50	2.70	6.00	T
		16A			0.20	0.30	0.50	0.90	1.40	2.30	4.80	T
		20A				0.30	0.40	0.80	1.30	2.10	4.30	T
		25A				-	0.40	0.70	1.20	1.80	4.00	T
		32A					-	0.60	1.10	1.50	3.10	8.40
		40A						-	1.00	1.40	2.80	7.70
	45A							1.10	1.60	2.90	7.00	
ADA1**U C Curve, 10kA, 30mA Type A	6A	0.10	0.10	0.20	0.30	0.50	1.10	2.00	3.30	6.80	T	
	10A	-	-	0.20	0.30	0.40	0.90	1.50	2.50	5.40	T	
	13A		-	-	-	0.40	0.80	1.40	2.20	4.50	T	
	16A			-	-	-	0.70	1.20	1.90	3.70	T	
	20A				-	-	-	1.10	1.70	3.50	T	
	25A					-	-	-	1.30	2.60	7.50	
	32A						-	-	-	2.40	6.60	
	40A							-	1.30	2.60	6.20	

Max Values (kA)		I _{cn}	I _n max	Upstream											
				10A	16A	20A	25A	32A	35A	40A	50A	63A	80A	100A	
Downstream	ARCxxx 1Ph+N B	6kA	ARC906D	6A	0.50	1.00	2.30	2.80	3.80	T	T	T	T	T	T
			ARC910D	10A	-	0.70	1.40	1.70	2.20	3.50	4.30	T	T	T	T
			ARC916D	16A	-	0.50	1.30	1.50	1.90	2.90	3.30	T	T	T	T
			ARC920D	20A	-	-	1.10	1.30	1.70	2.60	3.00	T	T	T	T
			ARC925D	25A	-	-	-	1.10	1.50	2.40	2.80	5.40	T	T	T
	ARCxxx 1Ph+N C	6kA	ARC956D	6A	0.80	1.10	2.40	2.80	4.00	T	T	T	T	T	T
			ARC960D	10A	0.50	0.80	1.40	1.60	2.10	3.40	4.10	T	T	T	T
			ARC966D	16A	-	-	1.30	1.50	1.90	3.00	3.50	T	T	T	T
			ARC970D	20A	-	-	-	-	1.50	2.30	2.60	5.20	T	T	T
			ARC975D	25A	-	-	-	-	-	2.20	2.50	4.80	T	T	T
	ARCxxx 1Ph+N B	10kA	ARC506D	6A	0.50	1.00	2.30	2.80	3.80	7.00	8.70	T	T	T	T
			ARC510D	10A	-	0.70	1.40	1.70	2.20	3.50	4.30	T	T	T	T
			ARC516D	16A	-	0.50	1.30	1.50	1.90	2.90	3.30	6.90	T	T	T
			ARC520D	20A	-	-	1.10	1.30	1.70	2.60	3.00	6.00	T	T	T
			ARC525D	25A	-	-	-	1.10	1.50	2.40	2.80	5.40	8.80	T	T
	ARCxxx 1Ph+N C	10kA	ARC556D	6A	0.80	1.10	2.40	2.80	4.00	7.20	8.40	T	T	T	T
			ARC560D	10A	0.50	0.80	1.40	1.60	2.10	3.40	4.10	T	T	T	T
			ARC566D	16A	-	-	1.30	1.50	1.90	3.00	3.50	7.50	T	T	T
			ARC570D	20A	-	-	-	-	1.50	2.30	2.60	5.20	T	T	T
			ARC575D	25A	-	-	-	-	-	2.20	2.50	4.80	9.10	T	T

Max Values (kA)		Upstream																								Downstream																							
		NBN B curve												NCN C curve																																			
In		6A	10A	13A	16A	20A	25A	32A	40A	50A	63A	1A	2A	3A	4A	6A	10A	13A	16A	20A	25A	32A	40A	50A	63A																								
		-	-	0.06	0.10	0.14	0.20	0.25	0.45	0.59	0.75	0.93	-	-	-	-	-	0.20	0.27	0.38	0.56	0.79	0.89	1.13	1.44	1.77																							
NBN B curve	10A	-	-	-	0.10	0.15	0.20	0.38	0.54	0.68	0.85	-	-	-	-	-	-	0.23	0.32	0.51	0.73	0.81	1.03	1.32	1.63																								
	13A	-	-	-	0.10	0.15	0.20	0.38	0.54	0.68	0.85	-	-	-	-	-	-	0.23	0.32	0.51	0.73	0.81	1.03	1.32	1.63																								
	16A	-	-	-	-	0.11	0.14	0.28	0.46	0.60	0.75	-	-	-	-	-	-	-	-	-	-	0.72	0.92	1.17	1.45																								
	20A	-	-	-	-	-	0.11	-	0.39	0.56	0.70	-	-	-	-	-	-	-	-	-	-	0.67	0.85	1.09	1.35																								
	25A	-	-	-	-	-	-	-	0.33	0.51	0.64	-	-	-	-	-	-	-	-	-	-	0.61	0.78	1.00	1.24																								
	32A	-	-	-	-	-	-	-	-	0.41	0.57	-	-	-	-	-	-	-	-	-	-	-	0.70	0.90	1.11																								
	40A	-	-	-	-	-	-	-	-	0.30	0.51	-	-	-	-	-	-	-	-	-	-	-	-	0.80	0.99																								
	50A	-	-	-	-	-	-	-	-	-	0.38	-	-	-	-	-	-	-	-	-	-	-	-	-	0.87																								
	63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																								
	NCN C curve	0.5A	0.06	0.13	0.19	0.66	2.17	4.35	T	T	T	T	0.01	0.04	0.06	0.10	0.16	0.45	0.75	T	T	T	T	T	T	T																							
1A		0.03	0.06	0.08	0.12	0.16	0.18	0.28	0.38	0.50	0.79	-	0.02	0.03	0.04	0.05	0.11	0.14	0.25	0.35	0.57	0.71	1.18	1.98	3.08																								
2A		0.03	0.05	0.07	0.10	0.13	0.15	0.23	0.31	0.41	0.55	-	-	0.02	0.03	0.05	0.11	0.13	0.21	0.29	0.44	0.50	0.84	1.43	2.24																								
3A		-	0.05	0.06	0.08	0.10	0.11	0.17	0.22	0.28	0.35	-	-	-	-	-	0.09	0.11	0.15	0.21	0.30	0.34	0.44	0.64	0.99																								
4A		-	0.04	0.06	0.07	0.10	0.11	0.16	0.21	0.27	0.34	-	-	-	-	-	0.09	0.11	0.15	0.20	0.29	0.32	0.42	0.58	0.87																								
6A		-	-	0.06	0.07	0.09	0.10	0.15	0.19	0.24	0.30	-	-	-	-	-	0.08	0.10	0.13	0.18	0.25	0.28	0.36	0.47	0.63																								
10A		-	-	-	-	0.08	0.09	0.14	0.17	0.22	0.28	-	-	-	-	-	-	0.09	0.12	0.16	0.24	0.27	0.35	0.45	0.59																								
13A		-	-	-	-	0.08	0.09	0.14	0.17	0.22	0.28	-	-	-	-	-	-	0.09	0.12	0.16	0.24	0.27	0.35	0.45	0.59																								
16A		-	-	-	-	-	-	0.13	0.17	0.22	0.27	-	-	-	-	-	-	-	-	-	0.23	0.26	0.33	0.43	0.54																								
20A		-	-	-	-	-	-	-	0.17	0.21	0.26	-	-	-	-	-	-	-	-	-	0.22	0.25	0.32	0.41	0.52																								
NDN D curve	25A	-	-	-	-	-	-	-	-	-	0.26	-	-	-	-	-	-	-	-	-	-	0.24	0.31	0.40	0.50																								
	32A	-	-	-	-	-	-	-	-	-	0.25	-	-	-	-	-	-	-	-	-	-	-	0.31	0.39	0.48																								
	40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.39	0.48																									
	50A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.48																									
	63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																									
	0.5A	0.05	0.10	0.15	0.45	1.14	2.19	T	T	T	T	0.01	0.02	0.04	0.06	0.10	0.25	0.33	0.51	T	T	T	T	T	T																								
	1A	0.03	0.05	0.07	0.12	0.16	0.19	0.30	0.41	0.58	0.88	-	-	0.02	0.04	0.05	0.11	0.13	0.27	0.38	0.65	0.80	1.28	2.06	3.10																								
	2A	-	0.05	0.06	0.10	0.13	0.16	0.26	0.35	0.47	0.70	-	-	-	0.03	0.05	0.10	0.13	0.23	0.32	0.52	0.65	1.02	1.64	2.44																								
	3A	-	0.04	0.06	0.08	0.10	0.12	0.18	0.24	0.31	0.41	-	-	-	-	-	0.09	0.11	0.16	0.22	0.34	0.38	0.51	0.81	1.18																								
	4A	-	-	-	0.07	0.09	0.11	0.17	0.22	0.29	0.37	-	-	-	-	-	0.08	0.10	0.15	0.21	0.31	0.35	0.47	0.70	1.03																								
	6A	-	-	-	-	0.09	0.10	0.14	0.19	0.24	0.30	-	-	-	-	-	-	0.10	0.13	0.18	0.26	0.29	0.37	0.49	0.66																								
	10A	-	-	-	-	-	-	-	0.17	0.22	0.28	-	-	-	-	-	-	-	-	-	0.24	0.27	0.34	0.45	0.59																								
	13A	-	-	-	-	-	-	-	0.17	0.22	0.28	-	-	-	-	-	-	-	-	-	0.24	0.27	0.34	0.45	0.59																								
	16A	-	-	-	-	-	-	-	-	-	0.26	-	-	-	-	-	-	-	-	-	-	-	0.32	0.42	0.53																								
	20A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.31	0.40	0.50																								
	25A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.40	0.49																								
	32A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.48																									
	40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																									
	50A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																								
	63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																								

Max Values (kA)		Upstream												HMC C curve				HMD D curve			
		0.5A	1A	2A	3A	4A	6A	10A	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	80A	100A	125A
NBN B curve	I _n	6A	-	-	-	-	0.14	0.35	0.67	0.80	1.06	1.49	1.62	2.33	2.65	2.61	3.08	3.2	5.2	4.65	5.45
		10A	-	-	-	-	-	-	0.61	0.73	0.97	1.37	1.49	2.14	2.44	2.4	2.84	2.95	4.8	4.29	5.03
		13A	-	-	-	-	-	-	0.61	0.73	0.97	1.37	1.49	2.14	2.44	2.4	2.84	2.95	4.8	4.29	5.03
		16A	-	-	-	-	-	-	-	-	0.86	1.21	1.32	1.91	2.17	2.14	2.53	2.63	4.29	3.84	4.5
		20A	-	-	-	-	-	-	-	-	0.80	1.13	1.23	1.78	2.02	1.99	2.36	2.45	4.01	3.58	4.2
		25A	-	-	-	-	-	-	-	-	-	1.04	1.13	1.64	1.86	1.84	2.17	2.26	3.7	3.3	3.88
		32A	-	-	-	-	-	-	-	-	-	-	1.01	1.47	1.67	1.65	1.96	2.03	3.33	2.97	3.49
		40A	-	-	-	-	-	-	-	-	-	-	-	1.31	1.50	1.48	1.75	1.82	2.99	2.67	3.13
		50A	-	-	-	-	-	-	-	-	-	-	-	-	1.32	1.3	1.54	1.61	2.64	2.36	2.77
		63A	-	-	-	-	-	-	-	-	-	-	-	-	-	1.13	1.34	1.39	2.29	2.04	2.4
NCN C curve	I _n	0.5A	0.01	0.02	0.06	0.10	0.16	0.26	1.44	T	T	T	T	T	T	T	T	T	T	T	T
		1A	-	-	0.03	0.05	0.07	0.10	0.20	0.44	0.58	1.03	2.13	2.54	5.48	7.56	7.26	T	T	T	T
		2A	-	-	-	0.04	0.06	0.09	0.17	0.36	0.44	0.73	1.53	1.84	4.05	5.34	5.17	7.8	8.64	T	T
		3A	-	-	-	-	-	-	0.14	0.25	0.30	0.41	0.69	0.82	1.74	2.27	2.2	3.12	3.37	T	7.6
		4A	-	-	-	-	-	-	0.14	0.24	0.29	0.39	0.62	0.73	1.50	1.93	1.87	2.6	2.8	7.27	5.85
		6A	-	-	-	-	-	-	0.12	0.21	0.26	0.34	0.48	0.54	0.95	1.16	1.13	1.47	1.56	3.29	2.77
		10A	-	-	-	-	-	-	-	0.20	0.24	0.32	0.47	0.51	0.87	1.05	1.03	1.31	1.38	2.8	2.38
		13A	-	-	-	-	-	-	-	0.20	0.24	0.32	0.47	0.51	0.87	1.05	1.03	1.31	1.38	2.8	2.38
		16A	-	-	-	-	-	-	-	-	0.23	0.31	0.44	0.48	0.79	0.95	0.93	1.17	1.24	2.44	2.09
		20A	-	-	-	-	-	-	-	-	-	0.30	0.43	0.47	0.75	0.89	0.87	1.09	1.15	2.22	1.91
NDN D curve	I _n	25A	-	-	-	-	-	-	-	-	0.29	0.42	0.46	0.73	0.86	0.85	1.06	1.11	2.13	1.84	2.27
		32A	-	-	-	-	-	-	-	-	-	-	0.44	0.68	0.81	0.79	0.99	1.04	1.98	1.71	2.11
		40A	-	-	-	-	-	-	-	-	-	-	-	0.67	0.80	0.78	0.97	1.02	1.92	1.66	2.04
		50A	-	-	-	-	-	-	-	-	-	-	-	-	0.80	0.78	0.96	1.01	1.84	1.6	1.95
		63A	-	-	-	-	-	-	-	-	-	-	-	-	-	0.74	0.91	0.95	1.73	1.51	1.84
		0.5A	-	0.02	0.08	0.14	0.25	0.46	4.05	T	T	T	T	T	T	T	T	T	T	T	T
		1A	-	-	0.03	0.04	0.06	0.10	0.19	0.48	0.66	1.13	2.20	2.59	5.27	7.35	7	T	T	T	T
		2A	-	-	-	0.04	0.06	0.08	0.16	0.41	0.53	0.90	1.74	2.05	4.12	5.27	5.12	7.66	8.54	T	T
		3A	-	-	-	-	0.05	0.08	0.14	0.28	0.34	0.47	0.86	1.00	1.96	2.48	2.41	3.28	3.51	9.71	7.35
		4A	-	-	-	-	-	-	0.13	0.25	0.31	0.43	0.75	0.87	1.71	2.16	2.1	2.86	3.06	8.08	6.1
		6A	-	-	-	-	-	-	0.12	0.21	0.26	0.35	0.51	0.57	0.99	1.20	1.18	1.51	1.6	3.32	2.8
		10A	-	-	-	-	-	-	-	0.20	0.24	0.32	0.47	0.51	0.87	1.05	1.03	1.31	1.38	2.8	2.38
		13A	-	-	-	-	-	-	-	0.20	0.24	0.32	0.47	0.51	0.87	1.05	1.03	1.31	1.38	2.8	2.38
		16A	-	-	-	-	-	-	-	0.20	0.24	0.32	0.47	0.51	0.87	1.05	1.03	1.31	1.38	2.8	2.38
		20A	-	-	-	-	-	-	-	-	0.22	0.30	0.43	0.47	0.77	0.92	0.9	1.13	1.19	2.34	2
		25A	-	-	-	-	-	-	-	-	-	0.29	0.42	0.46	0.73	0.87	0.85	1.07	1.12	2.16	1.86
		32A	-	-	-	-	-	-	-	-	-	-	0.41	0.45	0.71	0.84	0.82	1.02	1.07	2.03	1.76
		40A	-	-	-	-	-	-	-	-	-	-	-	0.43	0.69	0.81	0.8	0.99	1.04	1.94	1.68
		50A	-	-	-	-	-	-	-	-	-	-	-	-	0.67	0.79	0.77	0.96	1	1.86	1.61
		63A	-	-	-	-	-	-	-	-	-	-	-	-	-	0.76	-	0.92	0.97	1.76	1.53
																-	-	0.94	1.68	1.47	1.78

		Upstream																							
Downstream	Max Values (kA)	NBN B Curve										NCN C Curve													
		I _n	6A	10A	16A	20A	25A	32A	40A	50A	63A	0,5A	1A	2A	3A	4A	6A	10A	16A	20A	25A	32A	40A	50A	63A
ADA1**U B Curve, 10kA Type A	6A	-	0.05	0.08	0.09	0.11	0.16	0.20	0.25	0.31	-	-	-	-	-	-	-	0.09	0.14	0.19	0.26	0.29	0.37	0.48	0.61
	10A	-	-	0.07	0.09	0.11	0.15	0.19	0.24	0.30	-	-	-	-	-	-	-	-	0.14	0.18	0.26	0.29	0.36	0.46	0.58
	16A	-	-	-	0.09	0.10	0.15	0.19	0.23	0.29	-	-	-	-	-	-	-	-	-	0.25	0.28	0.35	0.45	0.56	-
	20A	-	-	-	-	-	0.15	0.18	0.23	0.29	-	-	-	-	-	-	-	-	-	-	0.27	0.34	0.44	0.55	-
	25A	-	-	-	-	-	0.14	0.18	0.23	0.28	-	-	-	-	-	-	-	-	-	-	0.27	0.34	0.43	0.53	-
	32A	-	-	-	-	-	-	-	0.22	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.51
	40A	-	-	-	-	-	-	-	-	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.50
	45A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ADA1**U C Curve, 10kA, Type A	6A	-	-	0.08	0.09	0.11	0.15	0.19	0.24	0.30	-	-	-	-	-	-	-	0.09	0.14	0.18	0.26	0.29	0.37	0.47	0.60
	10A	-	-	-	0.09	0.10	0.15	0.19	0.24	0.29	-	-	-	-	-	-	-	-	0.14	0.18	0.25	0.28	0.36	0.45	0.57
	16A	-	-	-	-	-	0.15	0.19	0.23	0.29	-	-	-	-	-	-	-	-	-	0.25	0.28	0.35	0.45	0.56	-
	20A	-	-	-	-	-	-	0.18	0.23	0.29	-	-	-	-	-	-	-	-	-	-	0.27	0.34	0.44	0.54	-
	25A	-	-	-	-	-	-	-	0.22	0.28	-	-	-	-	-	-	-	-	-	-	-	0.33	0.42	0.52	-
	32A	-	-	-	-	-	-	-	-	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.50
	40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.48
	45A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		Upstream																					
		Max Values (kA)	NDN D Curve														HMC / HMF C Curve			HMD D Curve			
			I _n	0,5A	1A	2A	3A	4A	6A	10A	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	80A	100A	125A
Downstream	ADA1**U B Curve, 10kA Type A	6A	-	-	-	-	-	-	0.14	0.22	0.27	0.35	0.49	0.55	0.86	1.01	1.00	1.23	1.29	2.92	2.38	3.18	
		10A	-	-	-	-	-	-	-	0.22	0.26	0.34	0.48	0.52	0.81	0.95	0.93	1.14	1.19	2.60	2.11	2.83	
		16A	-	-	-	-	-	-	-	-	0.25	0.33	0.46	0.50	0.77	0.90	0.89	1.08	1.13	2.34	1.92	2.54	
		20A	-	-	-	-	-	-	-	-	-	0.32	0.45	0.49	0.76	0.88	0.87	1.06	1.11	2.17	1.81	2.34	
		25A	-	-	-	-	-	-	-	-	-	-	0.44	0.48	0.73	0.85	0.84	1.02	1.07	2.05	1.71	2.21	
		32A	-	-	-	-	-	-	-	-	-	-	-	-	-	0.69	0.80	0.79	0.94	0.99	1.77	1.49	1.90
		40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	0.76	0.92	0.95	1.67	1.43	1.80
		45A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.84	0.83	0.97	1.01	1.71	1.46	1.83
	ADA1**U C Curve, 10kA, Type A	6A	-	-	-	-	-	-	0.13	0.22	0.26	0.34	0.48	0.53	0.84	0.99	0.97	1.20	1.26	2.84	2.31	3.09	
		10A	-	-	-	-	-	-	-	0.21	0.25	0.33	0.47	0.51	0.80	0.93	0.91	1.12	1.17	2.51	2.04	2.72	
		16A	-	-	-	-	-	-	-	-	-	0.33	0.46	0.50	0.77	0.89	0.87	1.06	1.11	2.24	1.84	2.43	
		20A	-	-	-	-	-	-	-	-	-	-	0.45	0.49	0.75	0.87	0.85	1.03	1.08	2.10	1.74	2.27	
		25A	-	-	-	-	-	-	-	-	-	-	-	0.47	0.72	0.83	0.81	0.99	1.03	1.96	1.62	2.11	
		32A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	0.77	0.92	0.96	1.70	1.45	1.83
		40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	0.73	0.88	0.92	1.62	1.40	1.74
45A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.82	0.80	0.95	0.98	1.63	1.42	1.75	

Downstream

		Upstream																			
		Max Values (kA)	x160 18/25/40kA TM HDA											x250 25/40kATM					H250 50/70kA LSI		
Downstream	RCBO ADA1**U B Curve 10kA type A	I _n	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	160A	100A	125A	160A	200A	250A	40A	125A	250A
		6A	1.35	1.35	1.35	1.35	1.35	1.35	3.33	3.33	7.07	7.07	7.98	4.35	6.72	T	T	T	T	T	T
		10A	1.26	1.26	1.26	1.26	1.26	1.26	2.96	2.96	6.31	6.31	7.15	3.87	5.99	9.78	T	T	T	T	T
		16A	-	1.19	1.19	1.19	1.19	1.19	2.64	2.64	5.45	5.45	6.13	3.42	5.19	8.18	T	T	T	T	T
		20A		-	1.16	1.16	1.16	1.16	2.44	2.44	4.73	4.73	5.27	3.08	4.53	6.97	T	T	T	T	T
		25A			-	1.12	1.12	1.12	2.30	2.30	4.49	4.49	5.00	2.92	4.29	6.59	9.81	T	T	T	T
		32A				-	1.03	1.03	1.98	1.98	3.77	3.77	4.19	2.49	3.61	5.45	8.22	9.15	T	T	T
		40A					-	1.00	1.87	1.87	3.59	3.59	3.99	2.35	3.43	5.20	7.85	8.75	T	T	T
		45A						1.05	1.90	1.90	3.56	3.56	3.94	2.38	3.41	5.09	7.38	8.12	T	T	T
	RCBO ADA1** C curve 10kA type A	6A	1.33	1.33	1.33	1.33	1.33	1.33	3.23	3.23	6.91	6.91	7.85	4.22	6.55	T	T	T	T	T	T
		10A	1.23	1.23	1.23	1.23	1.23	1.23	2.85	2.85	6.00	6.00	6.81	3.71	5.71	9.35	T	T	T	T	T
		16A	-	1.17	1.17	1.17	1.17	1.17	2.54	2.54	5.22	5.22	5.87	3.28	4.97	7.92	T	T	T	T	T
		20A			1.13	1.13	1.13	1.13	2.36	2.36	4.69	4.69	5.25	3.01	4.48	7.03	T	T	T	T	T
		25A			-	1.08	1.08	1.08	2.20	2.20	4.38	4.38	4.90	2.81	4.18	6.50	9.84	T	T	T	T
		32A					1.01	1.01	1.90	1.90	3.65	3.65	4.06	2.40	3.50	5.30	7.96	8.85	T	T	T
		40A						0.97	1.80	1.80	3.42	3.42	3.79	2.26	3.27	4.92	7.25	8.03	T	T	T
		45A						1.02	1.81	1.81	3.40	3.40	3.76	2.27	3.26	4.86	7.13	7.92	T	T	T

Max Values (kA)		x160 18 / 25 / 40kA TM															x250 25 / 40kA TM					H250 25 / 50 / 63kA TM										H250 50 / 70kA LSI				
		16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	160A	100A	125A	160A	200A	250A	20	32	50	63	100	125	160	200	250	40A	125A	250A							
NBN B curve	6A	1.20	1.63	2.22	3.13	4.26	5.81	7.92	T	T	T	T	T	T	T	T	T	1.63	2.22	3.13	4.26	5.81	7.92	T	T	T	T	T	T							
	10A	1.11	1.52	2.07	2.91	3.97	5.41	7.35	T	T	T	T	T	T	T	T	T	1.52	2.07	2.91	3.97	5.41	7.35	T	T	T	T	T	T							
	16A	-	1.34	1.83	2.59	3.54	4.83	6.61	8.97	T	T	T	9.94	T	T	T	T	1.34	1.83	2.59	3.54	4.83	6.61	T	T	T	T	T	T							
	20A	-	-	1.70	2.40	3.27	4.46	6.13	8.38	T	T	T	9.30	T	T	T	T	-	1.70	2.40	3.27	4.46	6.13	T	T	T	T	T	T							
	25A	-	-	-	2.24	3.04	4.13	5.68	7.73	T	T	T	8.56	T	T	T	T	-	-	2.24	3.04	4.13	5.68	T	T	-	-	T	T							
	32A	-	-	-	-	2.74	3.73	5.14	7.03	9.30	9.30	9.30	7.77	T	T	T	T	-	-	-	2.74	3.73	5.14	T	T	-	-	T	T							
	40A	-	-	-	-	-	3.33	4.57	6.32	8.36	8.36	9.06	6.99	9.24	T	T	T	-	-	-	-	3.33	4.57	T	T	-	-	T	T							
	50A	-	-	-	-	-	-	4.01	5.57	7.42	7.42	8.04	6.20	8.19	T	T	T	-	-	-	-	-	4.01	T	T	-	-	T	T							
	63A	-	-	-	-	-	-	-	4.78	6.45	6.45	6.99	5.34	7.13	9.68	T	T	-	-	-	-	-	-	-	T	-	-	T	T							
NCN C curve	0.5A	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T							
	1A	2.05	6.26	T	T	T	T	T	T	T	T	T	T	T	T	T	T	6.26	T	T	T	T	T	T	T	T	T	T	T							
	2A	0.56	2.46	8.16	T	T	T	T	T	T	T	T	T	T	T	T	T	2.46	T	T	T	T	T	T	T	T	T	T	T							
	3A	-	-	1.28	3.81	8.22	T	T	T	T	T	T	T	T	T	T	T	-	3.81	T	T	T	T	T	T	T	T	T	T							
	4A	-	-	0.79	2.88	7.43	T	T	T	T	T	T	T	T	T	T	T	-	2.88	T	T	T	T	T	T	T	T	T	T							
	6A	-	-	-	0.81	1.78	3.89	7.47	T	T	T	T	T	T	T	T	T	-	0.81	3.89	7.47	T	T	T	T	T	T	T	T							
	10A	-	-	-	0.67	1.34	2.69	5.53	9.18	T	T	T	T	T	T	T	T	-	0.67	2.69	5.53	T	T	T	T	T	T	T	T							
	16A	-	-	-	0.58	0.97	1.63	2.79	4.87	7.76	7.76	8.79	5.86	9.06	T	T	T	-	0.58	1.63	2.79	5.86	9.06	T	T	-	-	T	T							
	20A	-	-	-	0.56	0.91	1.50	2.50	4.25	6.80	6.80	7.65	5.08	7.87	T	T	T	-	0.56	1.50	2.50	5.08	7.87	T	T	-	-	T	T							
NDN D curve	25A	-	-	-	0.54	0.88	1.44	2.39	4.05	6.48	6.48	7.25	4.83	7.45	T	T	T	-	0.54	1.44	2.39	4.83	7.45	T	T	-	-	T	T							
	32A	-	-	-	-	0.84	1.37	2.26	3.80	6.12	6.12	6.79	4.52	6.96	T	T	T	-	-	1.37	2.26	4.52	6.96	T	T	-	-	T	T							
	40A	-	-	-	-	-	1.31	2.13	3.50	5.56	5.56	6.29	4.13	6.46	9.78	T	T	-	-	1.31	2.13	4.13	6.46	9.78	T	-	-	T	T							
	50A	-	-	-	-	-	-	1.99	3.23	5.07	5.07	5.78	3.80	5.96	8.66	T	T	-	-	-	1.99	3.80	5.96	8.66	T	-	-	-	T							
	63A	-	-	-	-	-	-	-	3.11	4.85	4.85	5.51	3.65	5.68	8.29	T	T	-	-	-	-	3.65	5.68	8.29	T	-	-	-	T							
	0.5A	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T							
	1A	-	2.94	T	T	T	T	T	T	T	T	T	T	T	T	T	T	2.94	T	T	T	T	T	T	T	T	T	T	T							
	2A	-	1.41	9.75	T	T	T	T	T	T	T	T	T	T	T	T	T	1.41	T	T	T	T	T	T	T	T	T	T	T							
	3A	-	-	0.84	3.54	8.47	T	T	T	T	T	T	T	T	T	T	T	-	3.54	T	T	T	T	T	T	T	T	T	T							
HMC / HMF C curve	4A	-	-	0.66	2.58	7.29	T	T	T	T	T	T	T	T	T	T	T	-	2.58	T	T	T	T	T	T	T	T	T	T							
	6A	-	-	-	0.70	1.61	3.69	7.40	T	T	T	T	T	T	T	T	T	-	0.70	3.69	7.40	T	T	T	T	T	T	T	T							
	10A	-	-	-	0.63	1.25	2.47	5.00	8.48	T	T	T	9.90	T	T	T	T	-	0.63	2.47	5.00	9.90	T	T	-	-	T	T								
	16A	-	-	-	0.56	0.95	1.62	2.81	4.96	7.83	7.83	8.83	6.00	9.09	T	T	T	-	0.56	1.62	2.81	6.00	9.09	T	T	-	-	T	T							
	20A	-	-	-	0.54	0.89	1.47	2.47	4.24	6.74	6.74	7.52	5.07	7.72	T	T	T	-	0.54	1.47	2.47	5.07	7.72	T	T	-	-	T	T							
	25A	-	-	-	0.52	0.85	1.39	2.32	3.93	6.32	6.32	7.05	4.68	7.24	T	T	T	-	0.52	1.39	2.32	4.68	7.24	T	T	-	-	T	T							
	32A	-	-	-	-	0.83	1.34	2.18	3.62	5.82	5.82	6.52	4.30	6.68	T	T	T	-	-	1.34	2.18	4.30	6.68	T	T	-	-	T	T							
	40A	-	-	-	-	-	1.26	2.04	3.33	5.28	5.28	6.02	3.93	6.18	9.25	T	T	-	-	1.26	2.04	3.93	6.18	9.25	T	-	-	T	T							
	50A	-	-	-	-	-	-	1.94	3.11	4.85	4.85	5.51	3.65	5.68	8.29	T	T	-	-	-	1.94	3.65	5.68	8.29	T	-	-	-	T							
HMD D curve	63A	-	-	-	-	-	-	-	2.93	4.49	4.49	5.08	3.41	5.24	7.77	9.58	T	-	-	-	-	3.41	5.24	7.77	9.58	T	-	-	-							
	80A	-	-	-	-	-	-	-	-	3.29	3.29	3.65	2.61	3.74	5.58	7.03	7.51	-	-	-	-	2.61	3.74	5.58	7.03	7.51	-	-	T							
	100A	-	-	-	-	-	-	-	-	-	-	3.29	3.65	-	3.74	5.58	7.03	7.51	-	-	-	-	3.74	5.58	7.03	7.51	-	-	T							
	125A	-	-	-	-	-	-	-	-	-	-	-	3.65	-	-	5.58	7.03	7.51	-	-	-	-	-	5.58	7.03	7.51	-	-	T							

150 Data is subject to errors and technical modifications.

	Max Values (kA)	Upstream																		
		IEC60898-1	I _{cn}	I _n max	x160 18/25/40kA TM											x250 25/40kA TM				
					16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	160A	100A	125A	160A	200A	250A
Downstream	AFDD ARCxxx 1Ph+N B	ARC906D	6kA	6A	1.89	1.89	1.89	1.89	1.89	1.89	T	T	T	T	T	T	T	T	T	
		ARC910D		10A	1.42	1.42	1.42	1.42	1.42	1.42	3.90	3.90	T	T	T	5.25	T	T	T	T
		ARC916D		16A	-	1.33	1.33	1.33	1.33	1.33	3.34	3.34	T	T	T	4.44	T	T	T	T
		ARC920D		20A	n/a	-	1.23	1.23	1.23	1.23	2.76	2.76	T	T	T	3.61	5.58	T	T	T
		ARC925D		25A	n/a	n/a	-	1.20	1.20	1.20	2.47	2.47	4.80	4.80	5.35	3.13	4.59	T	T	T
	AFDD ARCxxx 1Ph+N C	ARC956D	6kA	6A	1.85	1.85	1.85	1.85	1.85	1.85	5.29	5.29	T	T	T	T	T	T	T	T
		ARC960D		10A	1.40	1.40	1.40	1.40	1.40	1.40	3.81	3.81	T	T	T	5.15	T	T	T	T
		ARC966D		16A	-	1.32	1.32	1.32	1.32	1.32	3.27	3.27	T	T	T	4.35	T	T	T	T
		ARC970D		20A	n/a	-	1.21	1.21	1.21	1.21	2.68	2.68	T	T	T	3.49	5.36	T	T	T
		ARC975D		25A	n/a	n/a	-	1.16	1.16	1.16	2.49	2.49	5.24	5.24	T	3.24	4.98	T	T	T
	AFDD ARCxxx 1Ph+N B	ARC506D	10kA	6A	1.84	1.84	1.84	1.84	1.84	1.84	5.28	5.28	T	T	T	7.12	T	T	T	T
		ARC510D		10A	1.42	1.42	1.42	1.42	1.42	1.42	3.53	3.53	7.50	7.50	8.48	4.61	7.12	T	T	T
		ARC516D		16A	-	1.33	1.33	1.33	1.33	1.33	3.08	3.08	6.35	6.35	7.14	3.99	6.05	T	T	T
		ARC520D		20A	n/a	-	1.23	1.23	1.23	1.23	2.62	2.62	5.21	5.21	5.83	3.35	4.98	7.72	T	T
		ARC525D		25A	n/a	n/a	-	1.20	1.20	1.20	2.38	2.38	4.42	4.42	4.88	2.97	4.24	6.28	8.97	T
	AFDD ARCxxx 1Ph+N C	ARC556D	10kA	6A	1.81	1.81	1.81	1.81	1.81	1.81	4.69	4.69	T	T	T	6.14	9.52	T	T	T
		ARC560D		10A	1.40	1.40	1.40	1.40	1.40	1.40	3.46	3.46	7.40	7.40	8.37	4.53	7.03	T	T	T
		ARC566D		16A	-	1.32	1.32	1.32	1.32	1.32	3.03	3.03	6.24	6.24	7.02	3.91	5.94	9.43	T	T
		ARC570D		20A	n/a	-	1.21	1.21	1.21	1.21	2.53	2.53	4.94	4.94	5.51	3.21	4.72	7.25	T	T
		ARC575D		25A	n/a	n/a	-	1.16	1.16	1.16	2.39	2.39	4.72	4.72	5.28	3.04	4.51	6.97	T	T



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