Residential Distribution.

If home is where the heart is, then the consumer unit is its heartbeat. Discover our range of consumer units and small enclosures (conforming to I.S.10101 regulations and EN 61439-3 standards) are available in functional, stylish and innovative options for any home. Whilst our protection devices, including RCCBs, MCB's and RCBO's, offer protection from any unwanted bumps in the road.

04

SBE8101

SBE8101SPD

I.S.10101 Gamma IP30

Characteristics:
- Surface mounting enclosures, 1 - 4 rows, 13 - 52 modules.
- Conforms to EN 61439-3 and I.S.10101
- Made of insulating material coloured RAL 9010.
- Insulating chassis and frame.
- Fixed DIN rail for devices of a maximum shoulder measurement of 45mm.
- Distance between rail 125mm
- Premarked cable entries on top, bottom and side.
- Delivered with plain door and back plate, blanking strips and marking strip
- Optional; additional connection assemblies, cable trunking, back plates, plain and transparent doors, door locks.

Description	Dimensions mm	Pre–fitted devices	Cat ref.
Incomer: Isolator			
1 row 13 modulels	h.250 x w.250 x d.103	1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G)	**SBE7101**
2 rows 26 modules	h.375 x w. 250 x d.103	same as SBE7101	**SBE8101**
3 rows 39 modules	h.500 x w. 250 x d.103	same as SBE7101	**SBE9101**
4 rows 52 modules	h.625 x w. 250 x d.103	same as SBE7101	**SBE10101**
2 rows 26 modules SP	h.375 x w. 250 x d.103	1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G) 1 x 2P Surge Protection Device	**SBE8101SPD**
3 rows 39 modules	h.500 x w. 250 x d.103	same as SBE8101SPD	**SBE9101SPD**
4 rows 52 modules	h.625 x w. 250 x d.103	same as SBE8101SPD	**SBE10101SPD**
Incomer: MCB			
2 rows 26 modules	h.375 x w. 250 x d.103	1 x 63A MCB (NBN263R) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G)	**SBM8101**
3 rows 39 modules	h.500 x w. 250 x d.103	same as SBM8101	**SBM9101**
4 rows 52 modules	h.625 x w. 250 x d.103	same as SBM8101	**SBM10101**
2 rows 26 modules	h.375 x w. 250 x d.103	1 x 63A MCB (NBN263R) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G) 1 x 2P Surge Protection Device	**SBM8101SPD**
3 rows 39 modules	h.500 x w. 250 x d.103	same as SBM8101SPD	**SBM9101SPD**
4 rows 52 modules	h.625 x w. 250 x d.103	same as SBM8101SPD	**SBM10101SPD**

I.S.10101 Meter Tail Kit

Description	Dimensions mm	Pre–fitted devices	Cat ref.
1 row 3 modules	h.175 x w.110 x d.95	Meter Tail Protection Unit B Type 10kA MCB + VE103L enclosure	**MCU10101B**
1 row 3 modules	h.175 x w.110 x d.95	Meter Tail Protection Unit C Type 10kA MCB + VE103L enclosure	**MCU10101C**

Gamma IP30

SBE700

Characteristics:
- Surface mounting enclosures, 1- 4 rows, 13 - 52 modules.
- Conforms to EN 61439-3.
- Made of insulating material coloured RAL 9010.
- Insulating chassis and frame.
- Fixed DIN rail for devices of a maximum shoulder measurement of 45mm.
- Distance between rail 125mm
- Premarked cable entries on top, bottom and side.
- Delivered with plain door and back plate, blanking strips and marking strip
- Optional; additional connection assemblies, cable trunking, back plates, plain and transparent doors, door locks.

SBM900

Description	Dimensions mm	Pre–fitted devices	Qty.	Cat ref.
1 row 13 modules	h.250 x w.250 x d.103	1 x 80A Isolator (SBR180) 1 x 40A RCD (CDA240U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**SBE700**
2 rows 26 modules	h.375 x w. 250 x d.103	1 x 80A Isolator (SBR180) 1 x 40A RCD (CDA263U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**SBE800**
3 rows 39 modules	h.500 x w. 250 x d.103	Same devices as SBE800	1	**SBE900**
4 rows 52 modules	h.625 x w. 250 x d.103	Same devices as SBE800		**SBE1000**
1 row 13 modules	h.250 x w. 250 x d.103	1 x 63A MCB (NBN163R) 1 x 40A RCD (CDA240U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**SBM700**
2 rows 26 modules	h.500 x w. 250 x d.103	1 x 63A MCB (NBN163R) 1 x 40A RCD (CDA263U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**SBM800**
3 rows 39 modules	h.500 x w. 250 x d.103	Same devices as SBM800	1	**SBM900**
4 rows 52 modules	h.625 x w. 250 x d.103	Same devices as SBM800	1	**SBM1000**

Meter Tail Kit

MCU63

Description	Dimensions mm	Pre–fitted devices	Qty.	Cat ref.
1 row 3 modules	h.175 x w.110 x d.95	VE103L Enclosure + NBN163R	1	**MCU63**
1 row 3 modules	h.175 x w.110 x d.95	VE103L Enclosure + NCN163A	1	**MCU64**

Shower Changeover Units

SHN1

Description	Qty.	Cat ref.
Prioity c/o unit	1	**SHN1**
Non priority c/o unit c/w door	1	**SHN2**
3 shower c/o unit c/w door (non priority)	1	**SHN3**
7 way consumer unit c/w 2 shower non priority	1	**CU684**

GP213P GP213T

Doors - Plain & Transparent

Characteristics:
- Doors for gamma enclosures offer an additional protection of modular devices and increases ingress protection to IP40.
- Plain (RAL 9010) or transparent.
- Conforms to IEC 60695-2-10, IEC 60695-2-11: 850°C.

Description	Qty.	Cat ref.
Plain door depth: 30 mm for SBx700	1	**GP113P**
Plain door depth: 30 mm for SBxSBx800	1	**GP213P**
Plain door depth: 30 mm for SBxSBx900	1	**GP313P**
Transparent door depth: 30 mm for SBx700	1	**GP113T**
Transparent door depth: 30 mm for SBxSBx800	1	**GP213T**
Transparent door depth: 30 mm for SBxSBx900	1	**GP313T**

Door Lock with Key

Characteristics:
- Door lock with key for doors GP113P, GP213P, GP313P, GP113T, GP213T, GP313T.

Description	Qty.	Cat ref.
Door lock with key	1	**GZ35A**

GS113D

Back Plates

Characteristics:
- Back plate insulated material for enclosure SBx700, SBx800, SBx900.

Description	Qty.	Cat ref.
Back plate for SBx700	1	**GS113D**
Back plate for SBx800	1	**GS213D**
Back plate for SBx900	1	**GS313D**

S35S

Blanking Strips

Characteristics:
- Blanking strip to blank unused rows.

Description	Qty.	Cat ref.
Blanking strip width 12 modules	10	**S35S**
Blanking strip width 0.5 module	10	**P031F**
Blanking strip width 1 module	10	**P032F**

KB163P

KB163N

Busbars

Description	Mod. width	Qty.	Cat ref.
Single Pole 63A to be equipped with protection profiles, brown (phase), 10mm^2	13	1	**KB163P**
Single Pole 63A to be equipped with protection profiles, blue (neutral), 10mm^2	13	1	**KB163N**

I.S.10101 Vega Consumer Units

VB8101T

VB8101TSPD

Consumer units with opaque or transparent doors, 1 - 4 rows, 18 - 72 modules.
Insultated unit, color RAL 9010, for energy distribution in residential installations or small commercial premises.
The chassis is removable one at a time and the DIN rails are removable one by one, using the clips. The DIN rails can be lowered to accommodate devices with a higher shoulder. For technical details see page 4.39.

The cabinet offers plenty of cabling space
- Between DIN rail and cabinet bottom: 47.5 mm,
- Between lowered DIN rail and bottom of cabinet: 18 mm
- Lateral wiring space between wall and DIN rail: 30 mm
- Distance between DIN rail: 150 mm

The cable entry plates are provided with clips which may also be screwed.

Delivered with
"Easy Wall Fixation" fastening system with plugs to guarantee class II, drawing board, shutters, label holder with marking labels, quickconnect grounding modules.

Options
- Lock with key nr. 1242E or 405
- IP41 kit
- Horizontal or vertical combination kits
- Wiring ducts
- Plate with flexible cable entries

Characteristics
- IP40 (with door) / IK07
- Insulation class: II
- In 90 A for 1 and 2-row enclosures
- In 125 A for 3 and 4-row enclosures
- Incandescent wire: 650 ° C

Norms
CEBEC
Conforms with EN 60670-24, EN 61439-3 and I.S.10101

Description		Dimensions mm	Plain Door Cat ref.	Transparent Door Cat ref.
Enclosure 1 row, 18 mod.	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10) 1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G)	w.400 x h.325 x d.146	**VB7101P**	**VB7101T**
Enclosure 2 rows, 36 mod.	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10) Same devices as VB7101P	w.400 x h.475 x d.146	**VB8101P**	**VB8101T**
Enclosure 3 rows, 54 mod.	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11x16 + 13x10) Same devices as VB7101P	w.400 x h.625 x d. 14	**VB9101P**	**VB9101T**
Enclosure 4 rows, 72 mod.	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10) Same devices as VB7101P	w.400 x h.775 x d.146	**VB10101P**	**VB10101T**
Enclosure 1 row, 18 mod.	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10) 1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G) 1 x 2P Surge Protection Device	w.400 x h.325 x d.146	**VB7101PSPD**	**VB7101TSPD**
Enclosure 2 rows, 36 mod.	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10) Same devices as VB7101PSPD	w.400 x h.475 x d.146	**VB8101PSPD**	**VB8101TSPD**
Enclosure 3 rows, 54 mod.	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11x16 + 13x10) Same devices as VB7101PSPD	w.400 x h.625 x d. 14	**VB9101PSPD**	**VB9101TSPD**
Enclosure 4 rows, 72 mod.	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10) Same devices as VB7101PSPD	w.400 x h.775 x d.146	**VB10101PSPD**	**VB10101TSPD**

VB800P

VB800T

Vega Consumer Units

Consumer units with opaque or transparent doors, 1 - 4 rows, 18 - 72 modules.
Insultated unit, color RAL 9010, for energy distribution in residential installations or small commercial premises.
The chassis is removable one at a time and the DIN rails are removable one by one, using the clips. The DIN rails can be lowered to accommodate devices with a higher shoulder. For technical details see page 4.39.

The cabinet offers plenty of cabling space
- Between DIN rail and cabinet bottom: 47.5 mm,
- Between lowered DIN rail and bottom of cabinet: 18 mm
- Lateral wiring space between wall and DIN rail: 30 mm
- Distance between DIN rail: 150 mm

The cable entry plates are provided with clips which may also be screwed.

Delivered with
"Easy Wall Fixation" fastening system with plugs to guarantee class II, drawing board, shutters, label holder with marking labels, quickconnect grounding modules.

Options
- Lock with key nr. 1242E or 405
- IP41 kit
- Horizontal or vertical combination kits
- Wiring ducts
- Plate with flexible cable entries

Characteristics
- IP40 (with door) / IK07
- Insulation class: II
- In 90 A for 1 and 2-row enclosures
- In 125 A for 3 and 4-row enclosures
- Incandescent wire: 650 ° C

Norms
CEBEC
Conforms with EN 60670-24 and EN 61439-3

Description		Dimensions mm	Cat ref.
Enclosure with transparent door 1 row, 18 modules	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10) 1 x 80A Isolator (SBR180) 1 x 40A RCD (CDA240U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	w.400 x h.325 x d.146	**VB700T**
Enclosure with opaque door 1 row, 18 modules	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10 Same devices as VB700T	w.400 x h.325 x d.146	**VB700P**
Enclosure with transp. door 2 rows, 36 modules	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10) Same devices as VB700T	w.400 x h.475 x d.146	**VB800T**
Enclosure with opaque door 2 rows, 36 modules	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10) Same devices as VB700T	w.400 x h.475 x d.146	**VB800P**
Enclosure with transparent door 3 rows, 54 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11x16 + 13x10) Same devices as VB700T	w.400 x h.625 x d. 14	**VB900T**
Enclosure with opaque door 3 rows, 54 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) Same devices as VB700T	w.400 x h.625 x d.146	**VB900P**
Enclosure with transparent door 4 rows, 72 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10) Same devices as VB700T	w.400 x h.775 x d.146	**VB1000T**
Enclosure with opaque door 4 rows, 72 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10) Same devices as VB700T	w.400 x h.775 x d.146	**VB1000P**

Vega Enhanced Consumer Units

VBE880A

Consumer units with transparent doors, 2 - 3 rows, 36 - 54 modules.
Insultated unit, color RAL 9010, for energy distribution in residential installations or small commercial premises.
Suitable for use with enhanced 16kVa supply.

The cabinet offers plenty of cabling space
- Between DIN rail and cabinet bottom: 47.5 mm,
- Between lowered DIN rail and bottom of cabinet: 18 mm
- Lateral wiring space between wall and DIN rail: 30 mm
- Distance between DIN rail: 150 mm

The cable entry plates are provided with clips which may also be screwed.

Delivered with
"Easy Wall Fixation" fastening system with plugs to guarantee class II, drawing board, shutters, label holder with marking labels, quickconnect grounding modules.

Options
- Lock with key nr. 1242E or 405
- IP41 kit
- Horizontal or vertical combination kits
- Wiring ducts
- Plate with flexible cable entries

Characteristics
- IP40 (with door) / IK07
- Insulation class: II
- In 90 A for 2-row enclosures
- In 125 A for 3-row enclosures
- Incandescent wire: 650 ° C

Norms
CEBEC
Conforms with EN 60670-24 and EN 61439-3

Description		Dimensions mm	Cat ref.
Enclosure with transparent door 2 rows, 36 modules	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10) 1 x 80A Isolator (SBR180) 1 x 80A RCD (CD283U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	w.400 x h.475 x d.146	**VBE880A**
Enclosure with opaque door 3 rows, 54 modules	E: 2x(1x25 + 11x16 +13x10) N: 2x(1x25 + 11x16 +13x10 Same devices as VBE880A	w.400 x h.625 x d.146	**VBE980A**

Description	For enclosure	Cat ref.
Transparent door (supplied as spare part)	VB118W	**VZ118T**
	VB218W	**VZ218T**
	VB318W	**VZ318T**
	VB418W	**VZ418T**
Opaque door (supplied as spare part)	VB118J	**VZ118P**
	VB218J	**VZ218P**
	VB318J	**VZ318P**
	VB418J	**VZ418P**
Key lock delivered with 2 keys	for transparent door: lock 1242E	**VZ310TVB**
	for opaque door: lock 1242E	**VZ310PVB**

VZ318T VZ318P

VZ310PVB

Refer to page 4.12 for additional terminals

VF8101

VF8101SPD

I.S.10101 Volta VF Series

Characteristics:
- Distribution enclosures with metallic door 2 to 4 rows, 24 to 48 modules.
- Conforms to EN 61439-3 and I.S.10101
- Flush mounting in brick or partition walls removable chassis.
- For devices of shoulder measurement 47mm, distance between rails 125mm, flush part made out of insulated material, frame and door manufactured from metal, reversible door with integrated handle, sealable from cover, colour RAL 9010, complete with plain door.
- Options; key lock, connection assembly.

Description	Dimensions mm	Pre–fitted devices	Qty.	Cat ref.
2 rows, 24 modules	w.348 x h.505 x d.89	1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G)	1	**VF8101**
3 rows, 36 modules	w.348 x h.630 x d.89	same as VF8101	1	**VF9101**
4 rows, 48 modules	w.348 x h.755 x d.89	same as VF8101	1	**VF10101**
2 rows, 24 modules	w.348 x h.505 x d.89	1 x 80A Isolator (SBR280) 1 x 63A RCD (CDA263U) 4 x 20A MCB (MBN120W) 1 x 32A MCB (MBN132W) 2 x 6A RCBO (ADA306G) 1 x 2P Surge Protection Device		**VF8101SPD**
3 rows, 36 modules	w.348 x h.630 x d.89	same as VF8101SPD		**VF9101SPD**
4 rows, 48 modules	w.348 x h.755 x d.89	same as VF8101SPD		**VF10101SPD**

Volta VF Series

VF700

Characteristics:
- Distribution enclosures with metallic door 1 to 4 rows, 12 to 48 modules.
- Conforms to EN 61439-3.
- Flush mounting in brick or partition walls removable chassis.
- For devices of shoulder measurement 47mm, distance between rails 125mm, flush part made out of insulated material, frame and door manufactured from metal, reversible door with integrated handle, sealable from cover, colour RAL 9010, complete with plain door.
- Options; key lock, connection assembly.

Description	Dimensions mm	Pre–fitted devices	Qty.	Cat ref.
1 row, 12 modules	w.348 x h.356 x d.89	1 x 80A Isolator (SBR180) 1 x 40A RCD (CDA240U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**VF700**
2 rows, 24 modules	w.348 x h.505 x d.89	1 x 80A Isolator (SBR180) 1 x 63A RCD (CDA263U) 1 x 32A MCB (MBN132W) 2 x 10A MCB (MBN110W) 4 x 20A MCB (MBN120W)	1	**VF800**
3 rows, 36 modules	w.348 x h.630 x d.89	same as VF800	1	**VF900**
4 rows, 48 modules	w.348 x h.755 x d.89	same as VF800	1	**VF1000**

Doors - Steel & Transparent

Characteristics:
- Doors for Volta consumer units VF700, VF800 and VF900.

Description	Qty.	Transp. door Cat ref.	Steel door & frame Cat ref.
Door for VF700 consumer unit	1	**VZ131**	**VZ261**
Door for VF800 consumer unit	1	**VZ132**	**VZ262**
Door for VF900 consumer unit	1	**VZ133**	**VZ263**

Keylock Standard

Characteristics:
- Keylock for Volta consumer unit, delivered with 2 keys

Description	Qty.	Cat ref.
Keylock standard with 2 keys	1	**VZ303**

Blanking Strip

S35S

Characteristics:
- Blanking strip to blank unused rows.

Description	Qty.	Cat ref.
Blanking strip width 12 modules premarked	10	**S35S**

Connection Assembly

VZ403

Characteristics:
- Connection assembly single phase and TP + N63A

Description	Qty.	Cat ref.
Connection assembly single phase, 2 x (3 x 16 + 4 x 10)	1	**VZ403**
TP + N63A, 3 x (3 x 16 + 2 x 10), 1 x (5 x 16 + 6 x 10)	1	**VZ428**

Busbars

KB163P

KB163N

Description	Mod. width	Qty.	Cat ref.
Single Pole 63A to be equipped with protection profiles, brown (phase), 10mm^2	13	1	**KB163P**
Single Pole 63A to be equipped with protection profiles, blue (neutral), 10mm^2	13	1	**KB163N**

IP30 IK 07

Gamma 13

Characteristics:
- IP30 surface mounting enclosures 1 to 4 rows, from 13 to 52 modules. IP 30 - IK 07 (without door), IP 40 - IK 07 (with door).
- Enclosures are of an insulating material coloured RAL 9010.
- Insulating chassis and frame.
- Fixed DIN rail for devices of a maximum shoulder measurement of 45mm.
- Distance between rails 125mm.
- Premarked cable entries on top, bottom and side.
- Delivered with marking strip and blanking clips.
- DIN rail distance between centres: 125 mm.
- IEC 60 695-2-10 and 11: 750°C for enclosures, doors and 960°C for plates.
- Complies with IEC 61439-3.
- Options: Doors, back plates and key locks.
- For technical details see page 4.38.

GD113H

GD213H

Description	Dimensions mm	Brass terminal	Module blanks	Cat ref.
1 row, 13 mod	w.250 x h.250 x d.103	N: 1 x 25 + 11 x 16 + 13 x 10 N: 1 x 25 + 8 x 16 + 8 x 10 E: 1 x 25 + 11 x 16 + 13 x 10	6 mod	**GD113H**
2 rows, 26 mod	w.250 x h.375 x d.103	N: 1 x 25 + 11 x 16 + 13 x 10 N: 1 x 25 + 8 x 16 + 8 x 10 E: 1 x 25 + 11 x 16 + 13 x 10	6 mod	**GD213H**
3 rows, 39 mod	w.250 x h.500 x d.103	N: 1 x 25 + 11 x 16 + 13 x 10 N: 1 x 25 + 8 x 16 + 8 x 10 E: 1 x 25 + 11 x 16 + 13 x 10	13 mod	**GD313H**
4 rows, 52 mod	w.250 x h.625 x d.103	N: 1 x 25 + 11 x 16 + 13 x 10 E: 1 x 25 + 11 x 16 + 13 x 10	13 mod	**GD413H**

GP213P-GP213T

S35S

Accessories

Characteristics

Doors
- Doors for gamma enclosures offer an additional protection of modular devices and increases ingress protection to IP40.
- Plain (RAL9010) or transparent
- Delivered with: 2 hinges, Latch, 2 screws
- Options: Lock
- EC 60 695-2-10 and 11. 750°C: enclosures, doors, 960°C: plates

Description		Transp. door Cat ref.	Plain door Cat ref.
Door depth: 30mm	for GD113H	**GP113T**	**GP113P**
	for GD213H	**GP213T**	**GP213P**
	for GD313H	**GP313T**	**GP313P**
	for GD413H	**GP413T**	**GP413P**
Door lock with key for doors GD113P to GD413P and GD113T to GD413T			**GZ35A**
Back plate insulated material	for GD113H		**GS113D**
	for GD213H		**GS213D**
	for GD313H		**GS313D**
	for GD413H		**GS413D**
Blanking strip to blank unused rows, pack qty. 10	12 modules		**S35S**
	½ module		**P031F**
	1 module		**P032F**

Gamma 18

Characteristics:
- Enclosures 1 to 4 rows, from 18 to 72 modules.
- Delivered with: IP2X earth terminal + terminal support, IP2X Ph + N terminals (except 1R) + mounting plate (except 1 & 2R) accessories for vertical and horizontal connecting (except 1R), marking strip, blanking clips.
- IP 30 - IK 07 (without door) IP 30 - IK 07 (with door)
- Distance between rails 125mm.
- IEC 60 695-2-10 and 11. 750°C: enclosures, 960°C: plates.
- Options: Doors, backplates, keylocks.
- Complies with IEC61 439-3.
- Screw-type terminal bars cannot be fitted to Gamma 18 enclosures.

GD218A

Description	Dimensions mm	Quick connect	Module blanks	Cat ref.
1 row, 18 mod	w.355 x h.250 x d.103	E: 4 x 25 + 14 x 4 mm²	6 mod	**GD118A**
2 rows, 36 mod	w.355 x h.375 x d.103	Ph: 2 x 16 + 2 x 10 mm² N: 2 x 16 + 2 x 10 mm² E: 6 x 25 + 20 x 4 mm²	12 mod	**GD218A**
3 rows, 54 mod	w.355 x h.500 x d.103	Ph: 3 x 16 + 4 x 10 mm² N: 3 x 16 + 4 x 10 mm² E: 8 x 25 + 28 x 4 mm²	18 mod	**GD318A**
4 rows, 72 mod	w.355 x h.625 x d.103	Ph: 3 x 16 + 4 x 10 mm² N: 3 x 16 + 4 x 10 mm² E: 10 x 25 + 34 x 4 mm²	24 mod	**GD418A**

Accessories

Description		Transp. door Cat ref.	Plain door Cat ref.
Plain and transparent doors, depth: 30mm	for GD118A, GD018A	**GP118T**	**GP118P**
	for GD218A	**GP218T**	**GP218P**
	for GD318A	**GP318T**	**GP318P**
	for GD418A	**GP418T**	**GP418P**

GP118P-GP118T

Description	Cat ref.
Keylock for plain and transparent doors	**GZ35A**

Description		Cat ref.
Back plates, insulated material, class II, to mount on the back of gamma 18 enclosure	for GD118A	**GS118D**
	for GD218A	**GS218D**
	for GD318A	**GS318D**
	for GD418A	**GS418D**

GS218D

Description	Modules	Cat ref.
Blanking clips to blank unused rows	½ mod	**P031**
	1 mod	**P032**
Blanking strip to blank a complete unused row	18 mod	**JP015**

Additional Terminals

	Terminal block with support		Terminal block w/o support
Description	Neutral Cat. ref	Earth Cat. ref	Cat ref.
Terminal block 3 x 16 + 4 x 10 mm²	KM07N	KM07E	**K142**
Terminal block 5 x 16 + 6 x 10 mm²	KM11N	KM11E	**K144**
Terminal block 6 x 16 + 7 x 10 mm²	KM13N	KM13E	**K148**
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm²	KM17N	KM17E	**K156**
Terminal block 1 x 25 +11 x 16 + 3 x 10 mm²	KM25N	KM25E	**K158**

KM07N

KM13N

KM25N

GD104N

GD108N

Mini Gamma Enclosures

Characteristics
- Enclosures 1 row, from 2 to 10 modules
- Surface mounting enclosures, rigid bottom with fixed DIN rail for devices of a maximum shoulder measurement 47mm
- Sealable cover.
- With marking strips and screw cap cover for class II
- IEC 60 695-2-1/0 and 60 695-2-1/1.
- For technical details see page 4.38.

Options
- Door lock with key
- Plain or transparent door
- Earth and neutral terminals

Description	Brass terminal	Cat ref.
1 row, 2 modules, w. 55 x h. 160 x d. 82 mm		**GD102N**
1 row, 4 modules w. 110 x h. 180 x d. 82 mm	E: 2 x 16 + 2 x 10, N: 2 x 16 + 2 x 10	**GD104N**
1 row, 6 modules, w. 146 x h. 180 x d. 82 mm	E: 2 x 16 + 2 x 10, N: 2 x 16 + 2 x 10	**GD106N**
1 row, 8 modules, w. 182 x h. 180 x d. 82 mm	E: 3 x 16 + 4 x 10, N: 3 x 16 + 4 x 10	**GD108N**
1 row, 10 modules, w. 218 x h. 180 x d. 82 mm	E: 3 x 16 + 4 x 10, N: 3 x 16 + 4 x 10	**GD110N**

GP102T

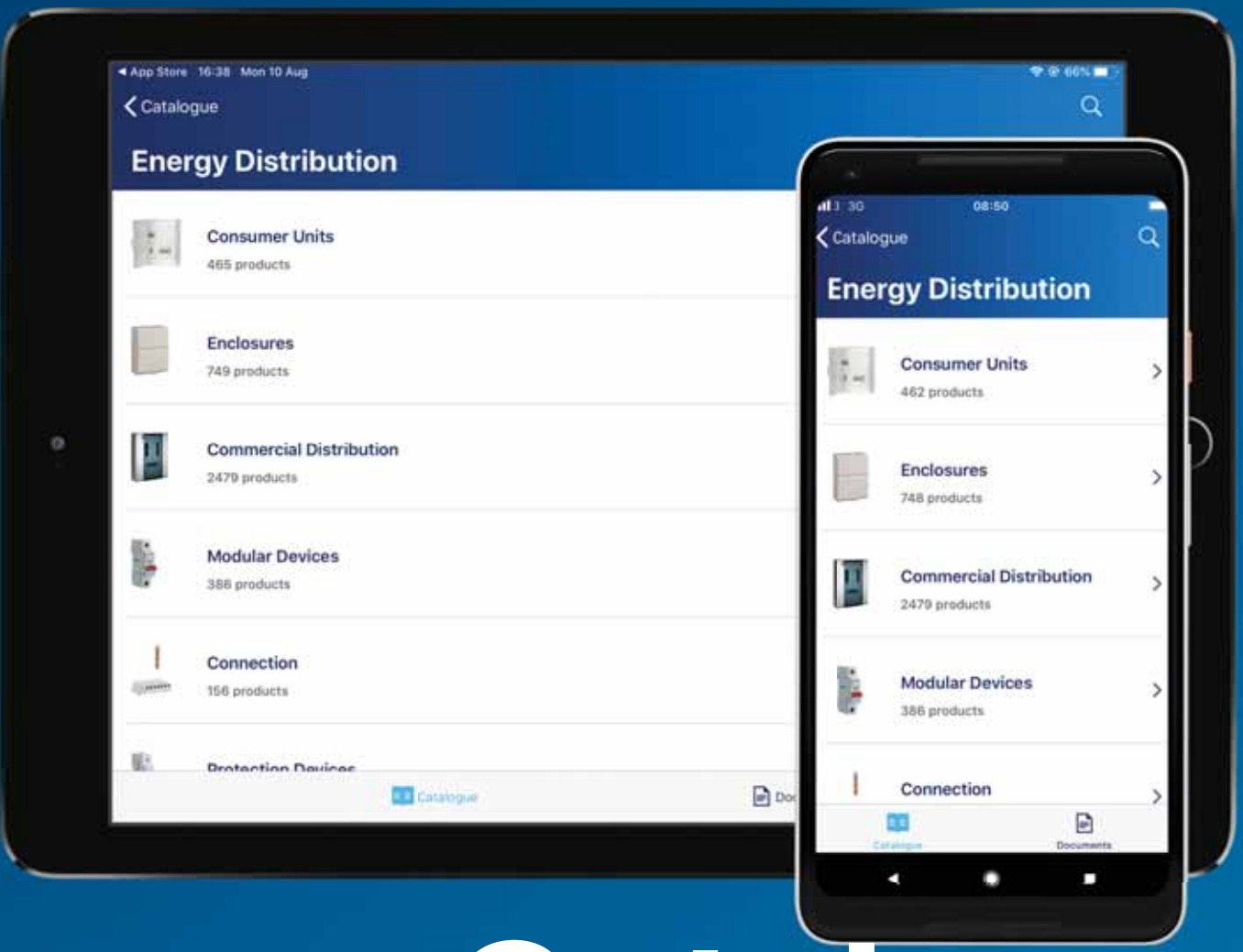
GD104S

GZ04N

Accessories

Description		Transp. door Cat ref.	Plain door Cat ref.
Doors with integrated handle	for GD102N	**GP102T**	**GP102P**
	for GD104N	**GP104T**	**GP104P**
	for GD106N	**GP106T**	**GP106P**
	for GD108N	**GP108T**	**GP108P**
	for GD110N	**GP110T**	**GP110P**

Description	Cat ref.
Keylock for plain or transparent door	**VZ313**
N-terminal 4 connections 2 x 16 + 2x 10	**GZ04N**
N-terminal 7 connections 3 x 16 + 4 x 10	**GZ07N**
PE-terminal 4 connections 2 x 16 + 2 x 10	**GZ04E**
PE-terminal 7 connections 3 x 16 + 4 x 10	**GZ07E**
Terminal support for GD104N	**GZ104S**
Terminal support for GD106N	**GZ106S**
Terminal support for GD108N	**GZ108S**
Terminal support for GD110N	**GZ110S**



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VB318W

VB318J

Vega Enclosures

Enclosures with opaque or transparent doors, 1 - 4 rows, 18 - 72 modules.
Insultated enclosure, color RAL 9010, for energy distribution in residential installations or small commercial premises. The chassis is removable one at a time and the DIN rails are removable one by one, using the clips. The DIN rails can be lowered to accommodate devices with a higher shoulder. For technical details see page 4.39.

The cabinet offers plenty of cabling space
- Between DIN rail and cabinet bottom: 47.5 mm,
- Between lowered DIN rail and bottom of cabinet: 18 mm
- Lateral wiring space between wall and DIN rail: 30 mm
- Distance between DIN rail: 150 mm

The cable entry plates are provided with clips which may also be screwed.

Delivered with
"Easy Wall Fixation" fastening system with plugs to guarantee class II, drawing board, shutters, label holder with marking labels, quickconnect grounding modules.

Options
- Lock with key nr. 1242E or 405
- IP41 kit
- Horizontal or vertical combination kits
- Wiring ducts
- Plate with flexible cable entries

Characteristics
- IP40 (with door) / IK07
- Insulation class: II
- In 90 A for 1 and 2-row enclosures
- In 125 A for 3 and 4-row enclosures
- Incandescent wire: 650 ° C

Norms
CEBEC
Conforms with EN 60670-24 et EN 61439-3

Description		Dimensions mm	Cat ref.
Enclosure with transparent door 1 row, 18 modules	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10)	w.400 x h.325 x d.146	**VB118W**
Enclosure with opaque door 1 row, 18 modules	E: 2x(1x25 + 5x16 + 5x10) N: 2x(1x25 + 5x16 + 5x10	w.400 x h.325 x d.146	**VB118J**
Enclosure with transp. door 2 rows, 36 modules	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10)	w.400 x h.475 x d.146	**VB218W**
Enclosure with opaque door 2 rows, 36 modules	E: 2x(1x25 + 8x16 + 8x10) N: 2x(1x25 + 8x16 + 8x10)	w.400 x h.475 x d.146	**VB218J**
Enclosure with transparent door 3 rows, 54 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11x16 + 13x10)	w.400 x h.625 x d. 14	**VB318W**
Enclosure with opaque door 3 rows, 54 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10)	w.400 x h.625 x d.146	**VB318J**
Enclosure with transparent door 4 rows, 72 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10)	w.400 x h.775 x d.146	**VB418W**
Enclosure with opaque door 4 rows, 72 modules	E: 2x(1x25 + 11x16 + 13x10) N: 2x(1x25 + 11 x16 + 13x10) + 2x(1x25 + 5x16 + 5x10)	w.400 x h.775 x d.146	**VB418J**

VZ318T

VZ318P

VZ318P

Accessories

Description	For enclosure	Cat ref.
Transparent door (supplied as spare part)	VB118W	**VZ118T**
	VB218W	**VZ218T**
	VB318W	**VZ318T**
	VB418W	**VZ418T**
Opaque door (supplied as spare part)	VB118J	**VZ118P**
	VB218J	**VZ218P**
	VB318J	**VZ318P**
	VB418J	**VZ418P**
Key lock delivered with 2 keys	for transparent door: lock 1242E	**VZ310TVB**
	for opaque door: lock 1242E	**VZ310PVB**

Refer to page 4.12 for additional terminals

Vector Enclosures IP55

Characteristics:
- Surface mounting enclosures with transparent doors
- 1 to 4 rows from 2 to 48 modules
- 1 to 3 rows from 18 to 54 modules
- Adjustable DIN rail for shoulder measurement 47 and 63 mm
- Transparent hinged cover (2 to 10) or door (12 to 54)
- 2 lateral knock outs for cable entry or coupling pieces
- With premarked knock outs for bushes or cable glands M20, M25, M32, M40 and M50
- Delivered with loose cable bushes
- Colour : light grey RAL 7035
- Nominal Voltage : Ui 400V~
- Nominal current : 63A at 230/400V~
- IP65 IK07 < 12 modules (IP65 when fitted with IP65 rated cable glands)
- IK08 > 12 modules
- Class II
- IEC 61 439-3
- IEC 60 695-2-10 and 60 695-2-11: 850°C
- For technical details see page 4.40.

VE212R

VE106R

VE312R

VE218R

Description		Dimensions mm	Cat ref.
Surface mounting enclosures with transparent door, 1 row 2 + 1 mod.	E: 2x16 + 2x10 mm² N: 2x16 + 2x10 mm²	w.111 x h.175 x d.93	**VE103L**
Surface mounting enclosures with transparent door, 1 row, 4 + 2 mod.	E: 3x16 + 4x10 mm² N: 3x16 + 4x10 mm²	w.165 x h.190 x d.113	**VE106R**
Surface mounting enclosures with transparent door, 1 row, 8 + 2 mod.	E: 5x16 + 6x10 mm² N: 5x16 + 6x10 mm²	w.237 x h.210 x d.114	**VE110L**
Surface mounting enclosures with transparent door, 1 row, 12 mod.	E: 1x25 + 5x16 +7x10 mm² N:1x25 + 5x16 +7x10 mm² N: 6x16 +7x10 mm²	w.310 x h.302 x d.151	**VE112R**
Surface mounting enclosures with transparent door, 2 rows, 24 mod.	E: 1x25 + 11x16 +13x10 mm² N: 1x25 + 5x16 +7x10 mm² N: 1x25 + 5x16 +7x10 mm²	w.310 x h.427 x d.151	**VE212R**
Surface mounting enclosures with transparent door, 3 rows, 36 mod.	E: 1x25 + 8x16 +8x10 mm² N: 1x25 + 8x16 +8x10 mm² N: 1x25 + 8x16 +8x10 mm²	w.310 x h.552 x d.151	**VE312R**
Surface mounting enclosures with transparent door, 4 rows, 48 mod.	E: 1x25 + 11x16 +13x10 mm² E: 1x25 + 11x16 +13x10 mm² N: 1x25 + 11x16 +13x10 mm² N: 1x25 + 11x16 +13x10 mm²	w.310 x h.677 x d.151	**VE412Y**
Surface mounting enclosures with transparent door, 1 row, 18 mod.	E : 1x25 + 11x16 +13x10 mm² N : 1x25 + 5x16 +7x10 mm², N : 1x25 + 5x16 +7x10 mm²	w.418 x h.302 x d.151	**VE118R**
Surface mounting enclosures with transparent door, 2 rows, 36 mod.	E : 1x25 + 8x16 +8x10 mm² N : 1x25 + 8x16 +8x10 mm², N : 1x25 + 8x16 +8x10 mm²	w.418 x h.452 x d.151	**VE218R**
Surface mounting enclosures with transparent door, 3 rows, 54 mod.	E : 1x25 + 11x16 +13x10 mm² N : 1x25 + 11x16 +13x10 mm², N : 1x25 + 11x16 +13x10 mm²	w.418 x h.602 x d.151	**VE318Y**

Accessories

VZ403

Description		Cat ref.
Single phase connection assembly 63A, snaps on lateral support	2x(3x16 + 4x10mm²)	**VZ403**
Three phase + N connection assembly 63A, snaps on lateral support	3x(3x16 + 2x10mm²),1x(5x16 + 6x10mm²)	**VZ428**
Lock with 2 keys for all enclosures from 2 to 54 modules		**VZ311**
Coupling sleeve to juxtapose enclosures, reduces iP to IP54 fit on lateral PG21 knock outs of the enclosures VE112, VE212, VE112, VE212, VE312, VE412, VE118, VE218, VE318		**VZ754**
Cable entry reduction of ingress protection to IP54	14xM20 + 10xM25 + 2xM32	**VZ758**
IP65 cable gland, M20		**VZ020M**
Blanking strips RAL 7035	6 modules	**VZ413**
	12 modules	**VZ415**
	18 modules	**VZ416**
Brackets for terminal support		**VZ744**

VZ754

VZ744

Refer to page 4.12 for additional terminals

VS108TDI

VS212TDI

VS412TDI

Golf Enclosures

Characteristics:
- Surface mounted distribution box from 1 to 4 rows, from 4 to 72 modules.
- Opaque or transparent door for devices up to 70 mm installation depth.
- DIN profile for modular devices 47 mm under the cover.
- Distance between the DIN profiles axis 125 mm.
- Distribution boards manufactured from plastic material.
- Door can be fitted on right or left without dismounting the cover.
- Optional lock with keys.
- Door opens up to 180º
- Enclosure can be installed either way up.
- Cable entries for cable, conduit and trunking.

Components included
- Brass screw-type terminals
- Directly fixed DIN rails to the wall box allow enough room behind for wiring.
- Marking stickers.
- Towers to fix cable ties for clear cable management are included, cable-retaining clips are optional (except in 4 and 8 module enclosures).
- Door protected by a plastic film.
- Carton packaging.

Technical data
- IP rating: IP30 without door, IP40 with door, IK07
- Isolation Class II
- White colour RAL 9010
- Rated current for devices up to 63 A
- Rated insulation: 400 V a.c./50 Hz
- Glow wiring test: 650ºC
- Certification according to IEC 61 439-3.
- All products conform to the ROHS and WEEE directives.
- For technical details see page 4.41.

Description		Dimensions mm	Cat ref.
Golf surface mounted enclosure 1 row 4 modules	N: 2x16mm² + 2x10mm² E: 2x16mm² + 2x10mm² N: 2x16mm² + 2x10mm²	h.184 x w.138 x d.99	**VS104TDI**
Golf surface mounted enclosure 1 row 8 modules	N: 3x16mm² + 4x10mm² E: 2x16mm² + 3x10mm² N: 2x16mm² + 3x10mm²	h.184 x w.210 x d.99	**VS108TDI**
Golf surface mounted enclosure 1 row 12 modules	N: 3x16mm² + 4x10mm² E: 3x16mm² + 4x10mm² N: 3x16mm² + 4x10mm²	h.252 x w.282 x d.99	**VS112TDI**
Golf surface mounted enclosure 1 row 18 modules	N: 3x16mm² + 4x10 mm² E: 1x25mm² + 4x16mm² + 5x10mm² N: 3x16mm² + 3x10mm²	h.257 x w.426 x d.72	**VS118TDI**
Golf surface mounted enclosure 1 rows 22 modules	N: 3x16mm² + 4x10mm² E: 6x16mm² + 7x10mm² N: 6x16mm² + 7x10mm²	h.252 x w.462 x d.99	**VS122TDI**
Golf surface mounted enclosure 2 rows 24 modules	N: 5x16mm² + 5x10mm² E: 4x16mm² + 5x10mm² N: 4x16mm² + 5x10mm²	h.377 x w.282 x d.99	**VS212TDI**
Golf surface mounted enclosure 2 rows 36 modules	N: 3 x 16mm² + 4 x 10mm² E: 1x25mm² + 6x16mm² + 7x10mm² N: 3 x 16mm² + 4 x 10mm²	h.377 x w.390 x d.99	**VS218TDI**
Golf surface mounted enclosure 3 rows 36 modules	N: 5x16mm² + 6x10mm² E: 5x16mm² + 6x10mm² N: 5x16mm² + 6x10mm²	h.500 x w.282 x d.99	**VS312TDI**
Golf surface mounted enclosure 3 rows 54 modules	N: 3x16mm² + 4x10mm² E: 1x25mm² + 7x16mm² + 8x10mm² N: 3x16 mm² + 4x10mm²	h.500 x w.390 x d.99	**VS318TDI**
Golf surface mounted enclosure 4 row 48 modules	N: 5x16mm² + 6x10mm² E: 6x16mm² + 8x10mm² N: 5x16mm² + 6x10mm²	h.647 x w.282 x d.99	**VS412TDI**
Golf surface mounted enclosure 4 rows 72 modules	N: 3 x 16 mm² + 4 x 10 mm² E: 1x25mm² + 8x16mm² + 9x10mm² N: 3x16mm² + 4x10mm²	h.647 x w.390 x d.99	**VS418TDI**

Accessories

Characteristics

New golf enclosures include an excellent range of accessories, every single feature is designed to save time and increase simplicity of mounting. It is also possible to find spare parts and additional accessories to the range, such as keys, locks and doors. Plain doors made of plastic material, RAL 9010. Transparent doors made of polycarbonate.

Description	For enclosure	Transp. door Cat ref.	Plain door Cat ref.
Doors (spare parts)	VF/VS104	**VZ621N**	**VZ601N**
	VF/VS108	**VZ622N**	**VZ602N**
	VF/VS112	**VZ623N**	**VZ603N**
	VF/VS212	**VZ624N**	**VZ604N**
	VF/VS312	**VZ625N**	**VZ605N**
	VF/VS412	**VZ626N**	**VZ606N**
	VF/VS118	**VZ627N**	**VZ607N**
	VF/VS218	**VZ628N**	**VZ608N**
	VF/VS318	**VZ629N**	**VZ609N**
	VF/VS418	**VZ630N**	**VZ610N**
Lock,supplied with 2 keys			**VZ794N**
Cable guides VF/VS, 4 pieces			**VZ699N**
Class II caps VS and horizontal assembly kit, 4 pieces			**VZ789N**
Brick wall mounting brackets, 4 pieces			**VZ786N**
Transparent label holder VF/VS 450 mm, 5 pieces			**VZ787N**
Labelling sticker, 10 pieces			**VZ788N**

VZ610N

VZ630N

VZ794N

VZ699N

VZ789N

VZ786N

VZ787N

Additional Terminals

Description	Terminal block with support Neutral Cat. ref	Terminal block with support Earth Cat. ref	Terminal block w/o support Cat ref.
Terminal block 3 x 16 + 4 x 10 mm²	KM07N	KM07E	**K142**
Terminal block 5 x 16 + 6 x 10 mm²	KM11N	KM11E	**K144**
Terminal block 6 x 16 + 7 x 10 mm²	KM13N	KM13E	**K148**
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm²	KM17N	KM17E	**K156**
Terminal block 1 x 25 +11 x 16 + 3 x 10 mm²	KM25N	KM25E	**K158**

KM07N

KM13N

KM25N

DR32SIE

HE47SN-IRL

DR Metal Enclosures

Characteristics
- Easy to install
- Removable DIN chassis
- Height adjustable DIN chassis
- Centre distance between two rows is 150mm
- Removable door
- Removable prepunched top and bottom gland plates

Technical Data
- 1.2mm thickness sheet steel with Epoxy powder coating in RAL 9002
- IP4x
- Suitable for modular incomers and outgoings only
- Accessories like key lock, joining kits, etc.
- Boards can be assembled vertically
- Complies with BS EN61439-1 and EN61439-3.
- For technical details see page 4.42.

Description	Dimensions mm	Cat ref.
Enclosure, 1 row 16 modules, N: 3x16mm^2 + 4x10mm^2, E: 1x25mm^2 + 8x16mm^2 + 8x10mm^2, N: 1x25mm^2 + 5x16mm^2 + 5x10mm^2	h.325 x w.405 x d.120	**DR16SIE**
Enclosure, 2 rows 32 modules, N: 6x16mm^2 + 7x10 mm^2 , E: 1x25mm^2 + 14x16mm^2 + 16x10mm2, N: 1x25mm^2 + 8x16mm^2 + 8x10mm^2	h.480 x w.405 x d.120	**DR32SIE**
Enclosure, 1 rows 6 + 9 modules,E: 15x16mm^2, N: 9x16mm^2 + 5x16mm^2	h.230 x w.390 x d.90	**HE47SN-IRL**

FW424WT

FW2 Metal Enclosures

Characteristics
- FW2 surface enclosure
- Metal inserts / cover plates
- Depth 150mm
- For devices up to 125A
- From 3 (36 modules) to (252 modules) 7 rows
- Complete with door, metal covers and PE/N terminals
- Colour RAL 9010
- Cable entry top and bottom
- IP30
- Complies with EN61439-1.

Description	Dimensions mm	Cat ref.
Enclosure, 3 rows, 36 modules, brass terminals 2x(6x16^2+7x10^2)	h. 641 x w. 355 x d.150	**FW312WT**
Enclosure, 3 rows, 72 modules, brass terminals 2x(1x25^2+8x16^2+8x10^2)	h. 641 x w. 571 x d.150	**FW324WT**
Enclosure, 4 rows, 48 modules, brass terminals 2x(6x16^2+7x10^2)	h. 791 x w. 355 x d.150	**FW412WT**
Enclosure, 4 rows, 96 modules, brass terminals 2x(1x25^2+11x16^2+13x10^2)	h. 791 x w. 571 x d.150	**FW424WT**
Encl. 4 rows, 144 mod., brass terminals 2x(1x25^2+11x16^2+13x10^2), 2x(6x16^2+7x10^2)	h. 791 x w. 787 x d.150	**FW436WT**
Enclosure, 5 rows, 60 modules, brass terminals 1x(1x25^2+8x16^2+8x10^2)	h. 941 x w. 355 x d.150	**FW512WT**
Enclosure, 5 rows, 120 modules, brass terminals 2x(1x25^2+11x16^2+13x10^2)	h. 941 x w. 571 x d.150	**FW524WT**
Encl. 5 rows, 180 mod. brs. term. 2x(1x25^2+11x16^2+13x10^2), 2x(1x25^2+8x16^2+8x10^2)	h. 941 x w. 787 x d.150	**FW536WT**
Encl. 6 rows, 72 mod. brass terminals 1x(1x25^2+8x16^2+8x10^2), 1x(6x16^2+7x10^2)	h. 1091 x w. 355 x d.150	**FW612WT**
Enclosure, 6 rows, 144 modules, brass terminals 2x(1x25^2+11x16^2+13x10^2)	h. 1091 x w. 571 x d.150	**FW624WT**
Encl. 6 rows, 216 mod. brs. term. 2x(1x25^2+11x16^2+13x10^2), 2x(1x25^2+8x16^2+8x10^2)	h. 1091 x w. 787 x d.150	**FW636WT**
Enclosure, 7 rows, 252 modules, brass terminals	h. 1241 x w. 787 x d.150	**FW736WT**

Accessories for FW2 Enclosures

Description	For enclosure	Modules	Qty.	Cat ref.
Terminal support and cable strain-relief bar	FWx12FT	12	1	**FZ12H**
	FWx12FT	24	1	**FZ24H**
	FWx36FT	36	1	**FZ36H**
Keylock			1	**FZ597**
Door with frame	FW312FT		1	**FW312FD**
	FW324FT		1	**FW324FD**
	FW412FT		1	**FW412FD**
	FW424FT		1	**FW424FD**
	FW436FT		1	**FW436FD**
	FW512FT		1	**FW512FD**
	FW524FT		1	**FW524FD**
	FW536FT		1	**FW536FD**
	FW612FT		1	**FW612FD**
	FW624FT		1	**FW624FD**
	FW636FT		1	**FW636FD**
	FW736FT		1	**FW736FD**

FZ24H + KM25N

FZ597

FW424FD

Additional Terminals

Description	Terminal block with support Neutral Cat. ref	 Earth Cat. ref	Terminal block w/o support Cat ref.
Terminal block 3 x 16 + 4 x 10 mm²	KM07N	KM07E	**K142**
Terminal block 5 x 16 + 6 x 10 mm²	KM11N	KM11E	**K144**
Terminal block 6 x 16 + 7 x 10 mm²	KM13N	KM13E	**K148**
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm²	KM17N	KM17E	**K156**
Terminal block 1 x 25 +11 x 16 + 3 x 10 mm²	KM25N	KM25E	**K158**

KM07N

KM13N

KM25N

FWB52

FW Metal Enclosures

Characteristics
- Distribution enclosures
- Extra slim depth 160 mm
- Insulation class: II - IP44
- For devices up to 125A
- 3 to 7 rows, 1 to 7 sections, from 36 to 336 modules
- For distribution< 125A in commercial installations
- For modular devices on DIN rails, max. depth 96 mm, shoulder measuring 47mm, depth: 160 mm
- Enclosure manufactured from sheet steel
- Colour RAL 9010 (pure white)
- Polyester front covers width 1 section
- 12 modules per row
- 125 mm between DIN rails
- 63 A connection assembly with earth and neutral bar in each section
- Quick Connect terminals
- For technical details see page 4.43.

Ingress protection
- IP44 to IEC 529
- Class II, additional internal insulation by polystyrene plates (P.S.), glow wire test till 850°C, extinguishing = 5 sec.

Rated insulated Voltage
- Ui : 400 V ~
- In : 125A - three phase 380 V ~

Options
- Trimming frame
- Lock with key
- Separators
- Connection assembly TP+N 63A
- Sealing kit

Description	Height mm	w. x d. mm	Fields	Rows	Modules	Cat ref.
FW metal surface enclosures	500	300 x 160	1	3	36	**FWB31**
	500	550 x 160	2	3	72	**FWB32**
	500	800 x 160	3	3	108	**FWB33**
	500	1050 x 160	4	3	144	**FWB34**
	650	300 x 160	1	4	48	**FWB41**
	650	550 x 160	2	4	96	**FWB42**
	650	800 x 160	3	4	144	**FWB43**
	650	1050 x 160	4	4	192	**FWB44**
	800	300 x 160	1	5	60	**FWB51**
	800	550 x 160	2	5	120	**FWB52**
	800	800 x 160	3	5	180	**FWB53**
	800	1050 x 160	4	5	240	**FWB54**
	950	300 x 160	1	6	72	**FWB61**
	950	550 x 160	2	6	144	**FWB62**
	950	800 x 160	3	6	216	**FWB63**
	950	1050 x 160	4	6	288	**FWB64**
	1100	300 x 160	1	7	84	**FWB71**
	1100	550 x 160	2	7	168	**FWB72**
	1100	800 x 160	3	7	252	**FWB73**
	1100	1050 x 160	4	7	336	**FWB74**

Accessories

Characteristics

Complete spans for modular devices and telecom applications can be easily integrated in the enclosure and combined according to needs.

Description	Height mm	Width mm	No. of spans	Rows	Modules.	Cat ref.
Mounting kits for enclosures 500mm	450	250	1	3	36	**UW31V**
Mounting kits for enclosures 650mm	600	250	1	4	48	**UW41V**
Mounting kits for enclosures 800mm	750	250	1	5	60	**UW51V**
Mounting kits for enclosures 950mm	900	250	1	6	72	**UW61V**
Mounting kits for enclosures 1100mm	1050	250	1	7	84	**UW71V**
Kits for perforated mounting plates (to be used with partitions)	310	248	1	3		**UN31TN**
	310	498	2	3		**UN32TN**
	460	248	1	4		**UN41TN**
	460	498	2	4		**UN42TN**
	610	248	1	5		**UN51TN**
	610	498	2	5		**UN52TN**
	760	248	1	6		**UN61TN**
	760	498	2	6		**UN62TN**
	910	248	1	7		**UN71TN**
	910	498	2	7		**UN72TN**
Perforated mounting plates	240	248	1	2		**UZ21M6**
	310	248	1	3		**UZ31M5**
	390	248	1	3		**UZ31M6**
	310	498	2	3		**UZ32M5**
	460	248	1	4		**UZ41M5**
	570	248	1	4		**UZ41M6**
	460	498	2	4		**UZ42M5**
	610	248	1	5		**UZ51M5**
	610	498	2	5		**UZ52M5**
	760	248	1	6		**UZ61M5**
	760	498	2	6		**UZ62M5**
Set of 2 uprights for enclosure h.500 mm						**UN03A**
Set of 2 uprights for enclosure h.650 mm						**UN04A**
Set of 2 uprights for enclosure h.800 mm						**UN05A**
Set of 2 uprights for enclosure h.950 mm						**UN06A**
Set of 2 uprights for enclosure h.1100 mm						**UN07A**
Connection earth for perforated plates	400mm, 1,5 mm²					**UL01G1**
Connection assembly TP+N 63A, to be fitted on the uprights of the 1 section wide chassis 3 x (1x25 + 2x16 +3x10), N: 1x25 + 3x16 + 7x10						**F010**
Opened protective covers DIN rails with distance between the centres: 125mm, for modular devices	150	250	1	1	12	**US11A3**
	300	250	1	2	24	**US21A3**
	450	250	1	3	36	**US31A3**
	600	250	1	4	48	**US41A5**
	750	250	1	5	60	**US51A5**
	900	250	1	6	72	**US61A5**
Closed protective covers	150	250	1	1	12	**US11A1**
	300	250	1	2	24	**US21A1**
	450	250	1	3	36	**US31A1**
	600	250	1	4	48	**US41A1**
	750	250	1	5	60	**US51A1**
	150	500	2	1	24	**US12A1**
	300	500	2	2	48	**US22A1**
	450	500	2	3	72	**US32A1**
	600	500	2	4	96	**US42A1**
	150	500	3	1	24	**US13A1**
	300	500	3	2	48	**US23A1**
	450	500	3	3	72	**US33A1**

UW61V

UN61TN

UZ61M5

UN03A

F010

US31A3

UZ04A1

UZ05A1

UZ03A1

UZ01A2

UZ40F1

ZZ10H

UZ25V2

UZ01V2

FZ803B

FZ890N

U850S

UT26B

Accessories

Description	Qty.	Cat ref.
Double towers with screw	1	**UZ04A1**
Top tower overpart, 15 mm / 1 set = 4 pieces	1 set	**UZ05A1**
Tower underparts with bar	1	**UZ03A1**
Low tower underparts	1	**UZ01A2**
Partitions vertical for enclosures height 500 mm	1	**UZ30F1**
Partitions vertical for enclosures height 650 mm	1	**UZ40F1**
Partitions vertical for enclosures height 800 mm	1	**UZ50F1**
Partitions vertical for enclosures height 950 mm	1	**UZ60F1**
Partitions vertical for enclosures height 1100 mm	1	**UZ70F1**
Partitions horizontal for 1 span width	1	**ZZ10H**
Cable guides, strap small section,1 set = 20 pieces	1set	**UZ25V2**
Fixing support for cable guide, vertical, clip fixing	1	**UZ01V2**
Wall fixing brackets, for flush and surface mounting, 1 set = 4 pieces	1set	**FZ803B**
Suspension rail length: 2 m, to mount enclosures, delivered with 4 brackets	1set	**FZ890N**
Suspension brackets for wall fixing rails FZ890N	1	**FZ799N**
Strain relief rails length: 140mm for mounting on lower/upper part profile C 25 x 10 mm, slot 11mm	1	**U850S**
Mounting plates with adjustable angle brackets, h.115 x w.210 mm, lowering 29 mm	1	**UT26A**
Mounting plates with adjustable angle brackets, h.215 x w.210 mm, lowering 29 mm	1	**UT26B**
Locks with 2 keys, to replace the original lock	1	**FZ597N**
Sealing caps without cap	1	**FZ226**
Sealing caps with cap, male square 8 mm centre, plastic	1	**FZ821N**
Sealing caps with cap, male square 6 mm centre, metal	1	**FZ822N**
Sealing caps with cap, with slot, plastic	1	**FZ823N**
Sealing caps with cap, with lock cylinder	1	**FZ824N**
Rails 7.5 mm lowered, 1 span, lowering up to 21 mm	1	**UT22B**
Rails 7.5 mm lowered, 1 span, lowering up to 32 mm	1	**U82A**
Diagram holders, flexible, A4 format, self adhesive to stick inside the doors	10	**FZ794**
Diagram holders, rigid, A4 format, made of metal sheet, delivered with fixing screws (from door height 800 mm and width 550 mm)	1	**FZ707**
Cable entry plate replacement	1	**FZ403**
Touch up paint for final touch colour RAL 9010 (pure white)	1	**FZ791N**
Blanking strips length 221 mm, to blank opening 9 mm pre-cut, RAL 9010 (pure white)	10	**S35S**
Blank strips length 221 mm, lockable, to blank & lock opening 9 mm pre-cut, RAL 9010 (pure white)	10	**ZZ34S**
Identifier strips, 1 span, to stick on protection plates, delivered with label (1 set = 12 pieces)	1 set	**UZ005**
Identifier labels, 1 span, to insert in UZ005 identifier strip,available on sheet (1 sheet = 12 labels)	1	**UZ006**
Marking systems, 1 set = 10 pieces, sheet “circuits caption” to stick on the inner side of the door	1 set	**VZ717**
Marking strips, 1 set = 10 pieces, transparent strip, with 14 module length label	1 set	**VZ602**
Connection assemblies for Quick Connect	1	**UZ00K1**
Universal adapters		**KN00A**
Level adapters		**UZ00K2**

Accessories

Description	Height mm	Width mm	For enclosure	Cat ref.
Finishing frame max. adjustment 45 mm for enclosures:	500	300	FWB31	**FZ011B**
	500	550	FWB32	**FZ012B**
	500	800	FWB33	**FZ013B**
	500	1050	FWB34	**FZ014B**
	650	300	FWB41	**FZ021B**
	650	550	FWB42	**FZ022B**
	650	800	FWB43	**FZ023B**
	650	1050	FWB44	**FZ024B**
	800	300	FWB51	**FZ11B**
	800	550	FWB52	**FZ12B**
	800	800	FWB53	**FZ13B**
	800	1050	FWB54	**FZ14B**
	950	300	FWB61	**FZ21B**
	950	550	FWB62	**FZ22B**
	950	800	FWB63	**FZ23B**
	950	1050	FWB64	**FZ24B**
	1100	300	FWB71	**FZ31B**
	1100	550	FWB72	**FZ32B**
	1100	800	FWB73	**FZ33B**
	1100	1050	FWB74	**FZ34B**

FZ22B

FZ001N

Description	For enclosure	Qty.	Left door Cat ref.	Right door Cat ref.
Plain doors	FWB31	1	-	**FZ001N**
	FWB32	1	-	**FZ002N**
	FWB33	1	**FZ003N**	**FZ002N**
	FWB34	1	**FZ004N**	**FZ002N**
	FWB41	1	-	**FZ005N**
	FWB42	1	-	**FZ006N**
	FWB43	1	**FZ007N**	**FZ006N**
	FWB44	1	**FZ008N**	**FZ006N**
	FWB51	1	-	**FZ009N**
	FWB52	1	-	**FZ010N**
	FWB53	1	**FZ011N**	**FZ010N**
	FWB54	1	**FZ012N**	**FZ010N**
	FWB61	1	-	**FZ013N**
	FWB62	1	-	**FZ014N**
	FWB63	1	**FZ015N**	**FZ014N**
	FWB64	1	**FZ016N**	**FZ014N**
	FWB71	1	-	**FZ021N**
	FWB72	1	-	**FZ022N**
	FWB73	1	**FZ023N**	**FZ022N**
	FWB74	1	**FZ024N**	**FZ022N**
Slotted doors	FWB42	1	-	**FZ006NV**
	FWB43	1	**FZ007NV**	**FZ006NV**
	FWB51	1	-	**FZ009NV**
	FWB52	1	-	**FZ010NV**
	FWB53	1	**FZ011NV**	**FZ010NV**
	FWB62	1	-	**FZ014NV**
	FWB71	1	-	**FZ021NV**
	FWB72L	1	-	**FZ022NV**

FZ106N

FZ401

FZ598N

FZ425

FZ428

UZ06A1

Accessories

Description	For enclosure Height mm	For enclosure Width mm	For enclosure Cat. ref.	Cat ref.
Transparent doors, w. 550mm, 2 sections	500	550 to 1050	FWB32, FWB33, FWB34	**FZ107N**
	650	550 to 1050	FWB42S, FWB43S, FWB44S	**FZ104N**
	800	550 to 1050	FWB52S, FWB53S, FWB54S	**FZ106N**
	950	550 to 1050	FWB62S, FWB63S, FWB64S	**FZ110N**
	1100	550 to 1050	FWB72S, FWB73S, FWB74S	**FZ102N**
Transparent doors, w. 300mm, 1 section	500	300	FWB31	**FZ105N**
	650	300	FWB41	**FZ108N**

All transparent doors can also use for appliance FW flush mounting.

Description	Cat ref.
Set of stoppers to block opened cable entries	**FZ401**
Door shield with handle with camlock, IP44	**FZ598N**
Cable entry for top and bottom	**FZ425**
Cable entry for rear cable entry	**FZ428**
Fixing screws for plates, spare screws, sealable for plate	**UZ06A1**

Volta Enclosures

VU24IE

Characteristics
- Distribution enclosure with metallic door, 1 to 4 rows, 12 to 48 modules
- Assembly of devices: to 63A
- Quick connection for the cover with 90° screw, sealable
- Reversible frame with 15mm perpendicularity adjustment
- Integrated spirit level
- Reversible door with integrated handle
- Frame height 9mm
- Brass terminal
- Side cabling channel
- Colour : RAL 9010 (pure white)
- IEC 61439-3. For technical details see page 4.45

VU36IE

Delivered with:
- Neutral and earth terminals
- Plaster connection
- Clip for circuit designation table on door (except 12 module enclosure)
- IEC60695-2-10, IEC60695-2-11: 850°C.

Description	Dimensions mm	Cat ref.
Volta flush mounting enclosure, 1 row 12 modules, N: (1x25 + 5x16 + 7x10)+ (1x25 + 3x16 + 7x10), E: (1x25 + 5x16 + 7x10)	h. 356 x w. 348	**VU12IE**
Volta flush mounting enclosure, 2 rows 24 modules, N: (1x25 + 7x16 + 9x10)+ (1x25 + 3x16 + 7x10), E: (1x25 + 7x16 + 9x10)	h. 505 x w. 348	**VU24IE**
Volta flush mounting enclosure, 3 rows 36 modules, N: (1x25 + 9x16 + 12x10) + (1x25 + 3x16 + 7x10), E: (1x25 + 9x16 + 12x10)	h. 630 x w. 348	**VU36IE**
Volta flush mounting enclosure, 4 rows 48 modules, N: (1x25 + 11x16 + 13x10)+ (1x25 + 3x16 + 7x10), E: (1x25 + 11x16 +13x10)	h. 755 x w. 348	**VU48IE**

Accessories

VZ131N

Description		1 Qty.	Cat ref.
Keylock standard		1	**VZ302N**
Spare keys, set of 2 keys, for lock VZ302N		1 set	**VZ304N**
Lock bolts, set of 2 lock bolts		1 set	**VZ225N**
Transpar. door for flush mounting Volta encl. frame w. 40mm, Colour RAL 9010 white	1 row	1	**VZ131N**
	2 rows	1	**VZ132N**
	3 rows	1	**VZ133N**
	4 rows	1	**VZ134N**
Raising frame to convert stnrd. version into “flat” version with 72mm installation depth	for VU12IE	1	**VZ111N**
	for VU24IE	1	**VZ112N**
	for VU36IE	1	**VZ113N**
	for VU48IE	1	**VZ114N**
Support frame for mirror and picture insert	support frame, Volta, 2 rows, white	1	**VZ801N**
	support frame, Volta, 3 rows, white	1	**VZ802N**
	support frame, Volta, 2 rows, black	1	**VZ803N**
	support frame, Volta, 3 rows, black	1	**VZ804N**
	support frame, Volta, 2 rows, matt silver	1	**VZ807N**
	support frame, Volta, 3 rows, matt silver	1	**VZ808N**
	support frame, Volta, 2 rows, sky blue	1	**VZ809N**
	support frame, Volta, 3 rows, sky blue	1	**VZ810N**
Mirror	mirror for Volta, 2 rows	1	**VZ811N**
	mirror for Volta, 3 rows	1	**VZ812N**
Picture insert	picture insert, Volta, 2 rows	1	**VZ813N**
	picture insert, Volta, 3 rows	1	**VZ814N**
Pinboard door black expanded plastic plate with aluminium frame colour: silver, for Volta, 2 rows		1	**VZ292N**
Pinboard door black expanded plastic plate with aluminium frame colour: silver, for Volta, 3 rows		1	**VZ293N**
Mounting kit for hollow wall distribution enclosures		1	**VZ405N**

VZ808N

VZ293N

Refer to page 4.27 for additional terminals

VF104TDI

VF212TDI

VF312TDI

Golf Enclosures

Characteristics
- Flush mounted distribution boxes from 1 to 4 rows, from 4 to 48 modules
- Opaque or transparent door for devices up to 70 mm installation depth
- DIN profile for modular
- devices 47 mm under the cover
- Distance between the DIN rails axis 125 mm
- Distribution boards manufactured from plastic material
- Door can be fitted on right or left without dismounting the cover
- Door opens up to 180°. Wall box and cover can be installed either way up
- Removable cable entry slider
- Cable entries for cable and conduit
- Complies with IEC 61 439-3

Delivered with
- Brass screw-type terminals
- Marking stickers
- Towers to fix cable ties for clear cable management are included, cable retaining clips are optional (except in 4 and 8 module enclosures.)
- Door protected by a plastic film
- Carton packaging
- DIN rails directly fixed to the wall box allow room for wiring behind them

Optional
- Lock and key
- Cable retaining clips

Description	Wall niche dimensions mm	Cat ref.
Golf flush mounted enclosure, 1 row 4 mod. N: 2x16mm² + 2x10mm². E: 2x16mm² + 2x10mm², N: 2x16mm² + 2x10mm²	h.189 x w.170 x d.72	**VF104TDI**
Golf flush mounted enclosure, 1 row 8 mod. N: 3x16mm² + 4x10mm² E: 3x16mm² + 3x10mm², N: 3x16mm² + 3x10mm²	h.189 x w.242 x d.72	**VF108TDI**
Golf flush mounted enclosure, 1 row 12 mod. N: 3x16mm² + 5x10mm², E: 3x16mm² + 4x10mm², N: 3x16mm² + 4x10 mm²	h.257 x w.318 x d.72	**VF112TDI**
Golf flush mounted enclosure, 1 row 22 mod.N: 3x16mm² + 4x10mm² E: 6x16mm² + 7x10mm², N: 6x16mm² + 7x10mm²	h.257 x w.498 x d.72	**VF122TDI**
Golf flush mounted enclosure, 2 rows 24 mod. N: 5x16mm² + 5x10mm², E: 4x16mm² + 5x10mm², N: 4x16mm² + 5x10mm²	h.382 x w.318 x d.72	**VF212TDI**
Golf flush mounted enclosure, 3 rows 36 mod. N: 5x16mm² + 6x10mm², E: 5x16 mm² + 6x10 mm², N: 5x16mm² + 6x10mm²	h.507 x w.318 x d.72	**VF312TDI**
Golf flush mounted enclosure, 4 rows 48 mod. N: 5 x 16 mm2 + 6 x 10 mm², E: 6 x 16 mm² + 7 x 10 mm², N: 6 x 16 mm² + 7 x 10 mm²	h.652 x w.318 x d.72	**VF412TDI**

KM07N

KM13N

KM25N

Additional Terminals

Description	Terminal block with support Neutral Cat. ref	 Earth Cat. ref	Terminal block w/o support Cat ref.
Terminal block 3 x 16 + 4 x 10 mm²	**KM07N**	**KM07E**	**K142**
Terminal block 5 x 16 + 6 x 10 mm²	**KM11N**	**KM11E**	**K144**
Terminal block 6 x 16 + 7 x 10 mm²	**KM13N**	**KM13E**	**K148**
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm²	**KM17N**	**KM17E**	**K156**
Terminal block 1 x 25 +11 x 16 + 3 x 10 mm²	**KM25N**	**KM25E**	**K158**

FW Enclosures

FWU62S

Characteristics
- Complete FW flush enclosure, with PE/N terminals per field DIN Rail 35 x 7.5mm, 125mm gap
- For devices up to 125A
- Complete boards come with door, DIN Rail chassis and shock protective cover
- Quick Connect Terminals for ease and safety
- Cable entries top and bottom
- Flat trimming frames
- Colour: RAL 9010 (pure white)
- Integrated cable rails
- Depth 112 mm
- Material: sheet steel
- Complies with IEC 61 439-3., IEC 60 695-2-10, IEC 60 695-2-11
- Glow wire test: 850°C
- For technical details see page 4.47.

Description	h. x w. mm	PE/N Terminals	Fields	Rows	Modules	Cat ref.
FW flush enclosure	500 x 300	2 x 10 + 1 x 18	1	3	36	**FWU31S**
	500 x 550	2 x 10 + 1 x 18	2	3	72	**FWU32S**
	500 x 800	2 x 10 + 1 x 18	3	3	108	**FWU33S**
	650 x 300	2 x 10 + 1 x 22	1	4	48	**FWU41S**
	650 x 550	2 x 10 + 1 x 22	2	4	96	**FWU42S**
	650 x 800	2 x 10 + 1 x 22	3	4	144	**FWU43S**
	800 x 300	2 x 10 + 1 x 22	1	5	60	**FWU51S**
	800 x 550	2 2 x 10 + 1 x 22 25	2	5	120	**FWU52S**
	800 x 800	2 x 10 + 1 x 22	3	5	180	**FWU53S**
	950 x 300	2 x 10 + 1 x 22	1	6	72	**FWU61S**
	950 x 550	2 x 10 + 1 x 22	2	6	144	**FWU62S**
	950 x 800	2 x 10 + 1 x 22	3	6	216	**FWU63S**
	1100 x 300	2 x 10 + 1 x 22	1	7	84	**FWU71S**
	1100 x 550	2 x 10 + 1 x 22	2	7	168	**FWU72S**
	1100 x 800	2 x 10 + 1 x 22	3	7	252	**FWU73S**

For non Quick Connect Terminal, use KMxxx accessories below.

Accessories

Description	PE/N Terminals	Section in mm²	Qty.	Cat ref.
PE + N connections snap on lateral support	2 x 13 each	6 x 16, 7 x 10	2	**KM13A**
	2 x 22 each	10 x 16, 12 x 10	2	**KM22A**
	2 x 25 each	11 x 16, 14 x 10	2	**KM25A**
	4 x 5 each	1 x 25, 2 x 16, 2 x 10	1	**KM05B**

KM25A

KM05B

CDA240U

CDA516D

RCCBs A type 6kA and 10kA 30mA

- Compact devices which provide RCD earth leakage protection (protect against electrical shocks by direct or indirect contacts). To open automatically in the event of an earth fault between phase and earth and/or neutral and earth.
- High sensitivity: 30mA instantaneous tripping (fixed)
- Medium sensitivity: 100mA, 300mA instantaneous or selective tripping (fixed)
- Current rating: 25 to 125A. Voltage rating: 230V AC (2P). Poles: 2P. Type: A. Frequency: 50Hz
- Connection capacity 25 to 63A: rigid conductors 25mm, flexible conductors 16mm²
- Connection capacity 80 and 100A: rigid conductors 50mm², flexible conductors 35mm²
- A type suitable for residual pulsating direct currents, whether suddenly applied or slowly rising. They are used whenever fault currents are not sinusoidal. Complies with EN61008-1. For technical details see page 4.51.

Description	In/A	Quantity	Cat ref.
RCCBs A type, 6kA 30mA, 2 Pole	25A	1	**CDA225U**
	40A	1	**CDA240U**
	63A	1	**CDA263U**
	80A	1	**CD283U**
	100A	1	**CD285U**
RCCBs A type, 10kA 30mA, 2 Pole			
	16A	1	**CDA516D**
	25A	1	**CDA525D**
	40A	1	**CDA540D**
	63A	1	**CDA563D**

MBN116W

MCBs Type B & C 6kA Single Pole

- Protection and control of circuits against overloads and short circuits.
- Circuit isolation..
- Breaking capacity : 6kA (IEC 60 898-1).
- Curves : B curve : 3 to 5 In. Voltage rating : 240/400V AC. Current rating : 6 to 63A.
- Frequency : 50/60Hz. Climate sealed : T2.
- Will accept accessories, except MUxxxx.
- Connection capacity: rigid conductors : 25mm², flexible conductors : 16mm².
- Complies with IEC 60 898-1 and EN 60898-1

Description	Width (17.5mm)	Quantity	B Curve Cat ref.	C Curve Cat ref.	C Curve without accessories Cat ref.
6A	1 Mod	12	**MBN106W**	**MCN106A**	**MU106A**
10A	1 Mod	12	**MBN110W**	**MCN110A**	**MU110A**
16A	1 Mod	12	**MBN116W**	**MCN116A**	**MU116A**
20A	1 Mod	12	**MBN120W**	**MCN120A**	**MU120A**
25A	1 Mod	12	**MBN125W**	**MCN125A**	**MU125A**
32A	1 Mod	12	**MBN132W**	**MCN132A**	**MU132A**
40A	1 Mod	12	**MBN140W**	**MCN140A**	**MU140A**
50A	1 Mod	12	**MBN150W**	**MCN150A**	**MU150A**
63A	1 Mod	12	**MBN163W**	**MCN163A**	**MU163A**

ADA106U

RCBOs Type B & C - 30mA 6kA, 1 Pole

- Compact protection devices which combine the overcurrent functions of an MCB with the earth fault functions of an RCCB in a single unit. A range of sensitivity and current ratings are available for use in domestic installations.
- Insulated DIN clip
- Complies with BS EN 61009-1, IEC61009-1, IEC610009-2-2,
- Sensitivities (fixed)
- 10mA and 30mA
- Breaking capacity: 10kA. Flying neutral lead: 200mm
- Terminal Capacities: 25mm² rigid, 16mm² flexible
- Application: 1 module devices provide a compact solution for installation in consumer units.
- These devices are 1 pole & solid neutral. Operating Voltage: 230V(AC) + 10%/-15% 50H. Locking kit = MZN175

Description	Width (17.5mm)	Quantity	B Curve Cat ref.	C Curve Cat ref.
6A	1 Mod	1	**ADA106U**	**ADA156U**
10A	1 Mod	1	**ADA110U**	**ADA160U**
16A	1 Mod	1	**ADA116U**	**ADA166U**
20A	1 Mod	1	**ADA120U**	**ADA170U**
25A	1 Mod	1	**ADA125U**	**ADA175U**
32A	1 Mod	1	**ADA132U**	**ADA182U**

Reduced Height RCBOs Type B - 30mA 6kA, 1 Pole

ADA307G

- Reduced height RCBO is designed to give more space in the consumer unit. The functional earth has been removed to allow easier installation.
- Compact protection devices which provide MCB overload protection and RCD earth leakage protection (protect against electrical shocks by direct or indirect contact).
- Sensitivity: High sensitivity: 30mA instant tripping (fixed). Medium sensitivity: 300mA instant tripping (fixed).
- Current rating: 6 to 32A.
- Curves: B.
- Voltage rating: 230V AC.
- A type.
- Frequency: 50Hz.
- Connection capacity: rigid conductors: 25mm², flexible conductors: 16mm².
- A type: Detects residual sinusoidal alternating currents, whether suddenly applied or slowly rising. They are used whenever fault currents are not sinusoidal. It is able to detect DC fault current generated by loads like washing machines, speed drives, microprocessing, electronic ballast.
- Approved according to EN 61009-1.

Description	Breaking capacity (IEC 60 898-1)	Width (17.5mm)	Quantity	B Curve Cat ref.
6A	6kA	1 mod	1	**ADA307G**
10A	6kA	1 mod	1	**ADA311G**
16A	6kA	1 mod	1	**ADA317G**
20A	6kA	1 mod	1	**ADA321G**
25A	6kA	1 mod	1	**ADA326G**
32A	6kA	1 mod	1	**ADA333G**

Standard Height RCBOs Type B - 30mA 6kA, 1 Pole

Description	Breaking capacity (IEC 60 898-1)	Width (17.5mm	Quantity	Cat ref.
40A	6kA	1 mod	1	**ADA140G**
45A	6kA	1 mod	1	**ADA145G**

RCBOs Type B & C - 30mA 6kA, 2 Pole

AD916J

- Compact protection devices which provide MCB overload protection and RCD earth leakage protection (protect against electrical shocks by direct or indirect contact).
- Sensitivity: High sensitivity: 30mA instant tripping (fixed). Medium sensitivity: 300mA instant tripping (fixed).
- Current rating: 6 to 40A.
- Curves: B. Voltage rating: 230V AC.
- Frequency: 50Hz.
- Connection capacity: rigid conductors: 25mm², flexible conductors: 16mm².
- A type: Detects residual sinusoidal alternating currents, whether suddenly applied or slowly rising. They are used whenever fault currents are not sinusoidal. It is able to detect DC fault current generated by loads like washing machines, speed drives, microprocessing, electronic ballast.
- Approved according to EN 61009-1. **(Suitable for use in ROI)**

Description	Breaking capacity (IEC 60 898-1)	Width (17.5mm)	Quantity	B Curve Cat ref.	C Curve Cat ref.
6A	6kA	2 mod	1	**AD906J**	**AD956J**
10A	6kA	2 mod	1	**AD910J**	**AD960J**
16A	6kA	2 mod	1	**AD916J**	**AD966J**
20A	6kA	2 mod	1	**AD920J**	**AD970J**
25A	6kA	2 mod	1	**AD925J**	**AD975J**
32A	6kA	2 mod	1	**AD932J**	**AD982J**
40A	6kA	2 mod	1	**AD940J**	**AD990J**

RCBOs Type B & C - 30mA 10kA, 2 Pole

ADA506D

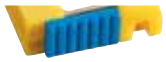
Description	Breaking capacity (IEC 60 898-1)	Width (17.5mm)	Quantity	B Curve Cat ref.	C Curve Cat ref.
6A	10kA	2 mod	1	**ADA506D**	**ADA556D**
10A	10kA	2 mod	1	**ADA510D**	**ADA560D**
16A	10kA	2 mod	1	**ADA516D**	**ADA566D**
20A	10kA	2 mod	1	**ADA520D**	**ADA570D**
25A	10kA	2 mod	1	**ADA525D**	**ADA575D**
32A	10kA	2 mod	1	**ADA532D**	**ADA582D**

ADS967D

FI / LS switch for 127 V networks, 1P + N, 6 kA, Quick Connect

Current Characteristics Fi - Type	Modules	Cat ref.
RCBO 1P+N 6kA 127V B-16A 30mA A Class QC&QB	2	**ADS917D**
RCBO 1P+N 6kA 127V C-16A 30mA A Class QC&QB	2	**ADS967D**

See Modular Devices & Connection page 2.31 for suitable busbars.



MZN175

Locking Kit

Characteristics:
- Allows MCBs, RCCBs and RCBOs to be locked in the off position. Will accept two padlocks with hasps of 4.75mm diameter max (supplied without padlock).

Description	Cat ref.
Padlockable locking kit for MCB, RCCB & RCBO (Padlock not included)	**MZN175**
Padlock with 2 keys 3/4"	**JK25A**

ARC906U

Arc Fault Detection Devices

Characteristics:
- Protection device which combines an MCB with an Arc Fault Detection Device.
- Complies with BS EN 62606
- Current rating 6A - 40A 6kA
- Available in B & C curve
- Connection capacity - Rigid=25mm^2, Flexible = 16mm^2

Description	Width (1 Mod =17.5mm)	B Curve Cat ref.	B Curve Cat ref.
6A	2 Mod	**ARC906U**	**ARC956U**
10A	2 Mod	**ARC910U**	**ARC960U**
16A	2 Mod	**ARC916U**	**ARC966U**
20A	2 Mod	**ARC920U**	**ARC970U**
25A	2 Mod	**ARC925U**	**ARC975U**
32A	2 Mod	**ARC932U**	**ARC982U**
40A	2 Mod	**ARC940U**	**ARC990U**

Surge Protection Type 1 + 2

SPA800

Technical Data
Conforms to IEC61643-1: T1 + T2
Rated operational voltage: 230/400V
Frequency: 50/60Hz
Protection level up: 1.5kV
Operating temperature: -40 to 80°C
Rated voltage Uc according to IEC61643-1: 350V

Characteristics
- For mounting on top hat rails
- Integrated remote signalling contact
- Contact type: 1 changeover contact

SPA081

Backup fuse	Earthing network	Modules	Nominal discharge capacity	Total discharge capacity	VPE	Cat ref.
315A	TN-C	6	25kA	75	1	**SPA800**
315A	TT/TN-S	8	25kA	100	1	**SPA801**

Replacement plug-in module for SPA80x

Description	Backup fuse	PU	Cat ref.
Plug-in module LN/PEN 350V 25kA	315A	1	**SPA081**

Surge Protection Type 2

SPB140R

These are used to limit the voltage to the specified values and can be connected downstream of combination protection and type 1 protection.

Surge Protection Type 2, 1 pole

Technical Data
Conforms to IEC61643-11: T2
Rated operational voltage: 230V
Frequency: 50/60Hz
Discharge capacity: 20kA
Protection level up: 1.35kV
Number of modules: 1
Operating temperature: -40 to 80°C
Rated voltage Uc according to IEC61643-1: 275V

Characteristics
- Integrated remote signalling contact
- Contact type: 1 changeover contact

Description	Cat ref.	With remote contact Cat ref.
Surge protection T2, 1 pole, 40kA, TNC	**SPB140D**	**SPB140R**

Surge Protection Type 2, 2 pole

SPB208D

Technical Data
Conforms to IEC61643-11: T2
Rated operational voltage: 230V
Frequency: 50/60Hz
Discharge capacity: 20kA
Protection level up: 1.35kV
Number of modules: 2
Operating temperature: -40 to 80°C
Rated voltage Uc according to IEC61643-1: 275V

Characteristics
- Integrated remote signalling contact
- Contact type : 1 changeover contact

Description	Cat ref.	With remote contact Cat ref.
Surge protection T2, 2 pole, 8kA, TNS/TT	**SPB208D**	**-**
Surge protection T2, 2 pole, 15kA, TNS/TT	**SPB215D**	**SPB215R**
Surge protection T2, 2 pole, 40kA, TNS/TT	**SPB240D**	**SPB240R**
Surge protection T2, 2 pole, 65kA, TNS/TT	**-**	**SPB265R**

SPB415R

Surge Protection Type 2, 4 pole

Technical Data
Conforms to IEC61643-11: T2
Rated operational voltage: 230/400V
Frequency: 50/60Hz
Discharge capacity: 20kA
Protection level up: 1.35kV
Number of modules: 4
Operating temperature: -40 to 80°C
Rated voltage Uc according to IEC61643-1: 275V

Characteristics
- Integrated remote signalling contact
- Contact type : 1 changeover contact

SPB008D

Description	Cat ref.	With remote contact Cat ref.
Surge protection T2, 4 pole, 8kA, TNS/TT	**SPB408D**	**-**
Surge protection T2, 4 pole, 15kA, TNS/TT	**SPB415D**	**SPB415R**
Surge protection T2, 4 pole, 40kA, TNS/TT	**SPB440D**	**SPB440R**
Surge protection T2, 4 pole, 65kA, TNS/TT	**-**	**SPB465R**

Replacement plug-in module Type 2

Description	Cat ref.
Cartridge L-N, In 2kA, Imax 8kA	**SPB008D**
Cartridge T2 L-N Uc 275V Up 1.35kV	**SPB015**
Cartridge L-N, In 5kA, Imax 15kA	**SPB015D**
Cartridge T2 N-PE Uc 260V Up 1.5kV	**SPB015N**
Cartridge L-N, In 20kA, Imax 40kA	**SPB040D**
Cartridge N-PE, In 20kA, Imax 40kA	**SPB040N**
Cartridge N-PE, In 20kA, Imax 65kA	**SPB065N**
Cartridge L-N, In 20kA, Imax 65kA	**SPB065R**

SPV340

Surge Protection Type 2, 3 pole, PV

Technical Data
Conforms to IEC61643-1: T2
Rated operational voltage: 1000V DC
Protection level up: 3.7kV
Operating temperature: -40 to 80°C

Characteristics
- Integrated remote signalling contact
- Contact type : 1 changeover contact

Description	Cat ref.
Surge protection T2, 3 pole, 40kA, PV	**SPV340**

Plug-in module Type 2, PV

Nominal discharge capacity	Protection level	PU	Cat ref.
40kA	1.9kV	1	**SPV040**

Surge Protection Type 3

These are used to limit the voltage to ≤ 1.5kV. Surge protection type 3 should be located as close as possible to the end of the device, so that the voltage level can be reduced to a tolerable value and recouplings can be neutralised.

SPC203N

Surge Protection Type 3

Technical Data
Conforms to IEC61643-11: T3
Rated operational voltage: 230V
Frequency: 50/60Hz
Protection level up: 1.4kV
Operating temperature: -40 to 80°C

Characteristics
- Integrated remote signalling contact
- Contact type: 1 changeover contact

Description	Modules	PU.	Cat ref.
Surge protection T3, 1 pole + N, 5kA	1	1	**SPC203N**
Surge protection T3, 3 pole + N, 3kA	2	1	**SPC403N**

Accessories for Surge Protection Type 3

Technical Data
Conforms to IEC61643-11: T3
Rated operational voltage: 230V
Frequency: 50/60Hz
Protection level up: 1.4kV
Operating temperature: -40 to 80°C

SPC023N

Description	PU.	Cat ref.
Plug-in module T3 1 pole Uc 264V In 5kA	1	**SPC023N**
Surge protection T3, N-PE Uc 264V In 3kA	1	**SPC043N**

Surge Protection for IP Broadband Connections

SPK603

Description	Protection level	PU.	Cat ref.
Surge protection for VDSL	250V	1	**SPK603**
Surge protection for (A) DSL and ISDN	300V	1	**SPK602**

SBN140

Switch Disconnectors

- For use as a switch disconnector in all types of circuits.
- Complies with: IEC 60947-3 for all ratings and to EN60669 for ratings from 16A to 63A

Features
- All switches have a green / red indication on the toggle giving positive contact indication.

Technical data
- Utilisation category AC22A 230V / 400V
- In: 16A to 32A frame size 1. Connection capacity: 16mm² - rigid conductor, 10mm² - flexible conductor
- In: 32A to 63A frame size 2. Connection capacity: 25mm² - rigid conductor, 16mm² - flexible conductor
- In: 63A to 125A frame size 3. Connection capacity: 50mm² - rigid conductor, 35mm² - flexible conductor

Description	Frame size	Mod. width	Qty.	Cat ref.
Single pole switch disconnectors				
1 x 16A - 230V AC	1	1	12	**SBN116**
1 x 25A - 230V AC	1	1	12	**SBN125**
1 x 32A - 230V AC	1	1	12	**SBN132**
1 x 32A* - 230V AC	2	1	12	**SBN133**
1 x 40A - 230V AC	2	1	12	**SBN140**
1 x 63A - 230V AC	2	1	12	**SBN163**
1 x 63A* - 230V AC	3	1	12	**SBN164**
1 x 80A - 230V AC	3	1	12	**SBN180**
1 x 100A - 230V AC	3	1	12	**SBN190**
1 x 125A - 230V AC	3	1	12	**SBN199**

SBN240

Description	Frame size	Mod. width	Qty.	Cat ref.
Double pole switch disconnectors				
2 x 16A - 230V AC	1	1	12	**SBN216**
2 x 25A - 230V AC	1	1	12	**SBN225**
2 x 32A - 230V AC	1	1	12	**SBN232**
2 x 32A* - 230V AC	2	2	6	**SBN233**
2 x 40A - 400V AC	2	2	6	**SBN240**
2 x 63A - 400V AC	2	2	6	**SBN263**
2 x 63A* - 400V AC	3	2	6	**SBN264**
2 x 80A - 400V AC	3	2	6	**SBN280**
x 2 x 100A - 400V AC	3	2	6	**SBN290**
2 x 125A - 400V AC	3	2	6	**SBN299**

SBN340

Description	Frame size	Mod. width	Qty.	Cat ref.
Three pole switch disconnectors				
3 x 16A - 400V AC	1	2	6	**SBN316**
3 x 25A - 400V AC	1	2	6	**SBN325**
3 x 32A - 400V AC	1	2	6	**SBN332**
3 x 32A* - 400V AC	2	3	4	**SBN333**
3 x 40A - 400V AC	2	3	4	**SBN340**
3 x 63A - 400V AC	2	3	4	**SBN363**
3 x 63A* - 400V AC	3	3	4	**SBN364**
3 x 80A - 400V AC	3	3	4	**SBN380**
3 x 100A - 400V AC	3	3	4	**SBN390**
3 x 125A - 400V AC	3	3	4	**SBN399**

SBN440

Description	Frame size	Mod. width	Qty.	Cat ref.
Four pole switch disconnectors				
4 x 16A - 400V AC	1	2	6	**SBN416**
4 x 25A - 400V AC	1	2	6	**SBN425**
4 x 32A - 400V AC	1	2	6	**SBN432**
4 x 32A* - 400V AC	2	4	3	**SBN433**
4 x 40A - 400V AC	2	4	3	**SBN440**
4 x 63A - 400V AC	2	4	3	**SBN463**
4 x 63A* - 400V AC	3	4	3	**SBN464**
4 x 80A - 400V AC	3	4	3	**SBN480**
4 x 100A - 400V AC	3	4	3	**SBN490**
4 x 125A - 400V AC	3	4	3	**SBN499**

Switch Disconnectors

- For use as a switch disconnector in all types of circuits.
- Complies with: IEC 60947-3 for all ratings and to EN60669 for ratings from 16A to 63A.

Features
- All switches have a green / red indication on the toggle giving positive contact indication.

Technical data
- Utilisation category AC22A 230V / 400V
- In: 16A to 32A frame size 1.
- Connection capacity: 16mm² - rigid conductor, 10mm² - flexible conductor
- In: 32A to 63A frame size 2.
- In: 80A to 125A frame size 3.
- Connection capacity: 50mm² - rigid conductor, 35mm² - flexible conductor

SBR163

Description	Frame size	Mod. width	Qty.	Cat ref.
Single pole switch disconnectors				
1 x 40A - 230V AC	2	1	12	**SBR140**
1 x 63A - 230V AC	2	1	12	**SBR163**
1 x 80A - 230V AC	3	1	12	**SBR180**
1 x 100A - 230V AC	3	1	12	**SBR190**
1 x 125A - 230V AC	3	1	12	**SBR199**

Description	Frame size	Mod. width	Qty.	Cat ref.
Double pole switch disconnectors				
2 x 40A - 400V AC	2	2	6	**SBR240**
2 x 63A - 400V AC	3	2	6	**SBR263**
2 x 80A - 400V AC	3	2	6	**SBR280**
2 x 100A - 400V AC	3	2	6	**SBR290**
2 x 125A - 400V AC	3	2	6	**SBR299**

SBR263

Description	Frame size	Mod. width	Qty.	Cat ref.
Three pole switch disconnectors				
3 x 40A - 400V AC	2	3	4	**SBR340**
3 x 63A - 400V AC	2	3	4	**SBR363**
3 x 80A - 400V AC	3	3	4	**SBR380**
3 x 100A - 400V AC	3	3	4	**SBR390**
3 x 125A - 400V AC	3	3	4	**SBR399**

SBR399

Description	Frame size	Mod. width	Qty.	Cat ref.
Four pole switch disconnectors				
4 x 63A - 400V AC	2	4	3	**SBR463**
4 x 100A - 400V AC	3	4	3	**SBR490**
4 x 125A - 400V AC	3	4	3	**SBR499**

SBR499

SBT116

Switch Disconnectors with Indicator Light

- For use as a switch disconnector in all types of circuits.
- Complies with:
- IEC 60947-3 and EN60669

Features
- Orange LED indicator light.
- LED life time: 100 000 h.
- All switches have a green / red indication on the toggle giving positive contact indication

Technical data
- Utilisation category AC22A 230V / 400V
- In: 16A to 32A frame size 1.
- Connection capacity: 16mm² - rigid conductor, 10mm² - flexible conductor

Description	Frame size	Mod. width	Qty.	Cat ref.
Single pole switch disconnectors with indicator light top				
1 x 16A - 230V AC	1	1	12	**SBT116**
1 x 25A - 230V AC	1	1	12	**SBT125**
1 x 32A - 230V AC	1	1	12	**SBT132**

Description	Frame size	Mod. width	Qty.	Cat ref.
Single pole switch disconnectors with indicator light bottom				
1 x 16A - 230V AC	1	1	12	**SBB116**
1 x 25A - 230V AC	1	1	12	**SBB125**
1 x 32A - 230V AC	1	1	12	**SBB132**

Description	Frame size	Mod. width	Qty.	Cat ref.
Double pole switch disconnectors with indicator light top				
2 x 16A - 230V AC	1	1	12	**SBT216**
2 x 25A - 230V AC	1	1	12	**SBT225**
2 x 32A - 230V AC	1	1	12	**SBT232**

Description	Frame size	Mod. width	Qty.	Cat ref.
Double pole switch disconnectors with indicator light bottom				
2 x 16A - 230V AC	1	1	12	**SBB216**
2 x 25A - 230V AC	1	1	12	**SBB225**
2 x 32A - 230V AC	1	1	12	**SBB232**

Description	Frame size	Mod. width	Qty.	Cat ref.
Double pole switch disconnectors with indicator light top & bottom				
2 x 16A - 230V AC	1	1	12	**SBM216**
2 x 25A - 230V AC	1	1	12	**SBM225**
2 x 32A - 230V AC	1	1	12	**SBM232**

Auxiliaries & Accessories

Auxiliary contact
- The auxiliary contact is common to the whole range of switch disconnectors from 16A to 125A with or without indicator light

Features
- The auxiliary contact have a mechanical indicator to show the position of the contact

Technical data
- Utilisation category AC12A 230V / 400V
- Connection capacity: 10mm² - rigid conductor, 6mm² - flexible conductor

Sealable terminal shrouds
- The sealable terminal shrould is compatible with switch disconnectors ratings from 32A to 63A frame size 2.
- For ratings from 63A to 125A frame size 3 switch disconnector, only the disible part is compatible to protect the front screw heads.

Phase barrier shield
- The phase barrier shield is compatible with switch disconnectors ratings ratings from 32A to 125A frame size 2&3.

Padlocking kit
- Allows to lock the device in the OFF and ON positions.
- Will accept two padlocks with hasps of 4.75mm diameter max. (supplied without padlock).

ESC080

Description	Mod. width	Qty.	Cat ref.
Auxiliary contact 1NO + 1NC			
Compatible with disconnector switches from 16 to 125A	0.5	1	**ESC080**

Description	Qty.	Cat ref.
Terminal shroud Compatible with switch disconnector from 32A to 63A frame size 2		
To shroud the connection terminal and screws. The screw cover can be sealed.	4	**MZN120**

MZN120

Description	Qty.	Cat ref.
Phase barrier shield		
Phase barrier shield	3	**MZN121**

MZN121

Description	Qty.	Cat ref.
Padlocking kit		
Padlocking kit	2	**MZN175**

MZN175

SFT232

Switch Disconnectors

- For use as a switch disconnector in all types of circuits.
- Complies with: IEC 60947-3 for all ratings and to EN60669 for ratings from 16A to 63A

Technical data

- Utilisation category AC22A 230V / 400V
- In: 16A to 40A frame size 1.
- Connection capacity: 16mm² - rigid conductor, 10mm² - flexible conductor

Description	Frame size	Mod. width	Qty.	Cat ref.
Centre OFF changeover switch I-0-II and common point on top				
1 x 25A - 230V AC	1	1	12	**SFT125**
1 x 32A - 230V AC	1	1	12	**SFT132**
1 x 40A - 230V AC	1	1	12	**SFT140**
2 x 25A - 230V AC	1	2	6	**SFT225**
2 x 32A - 230V AC	1	2	6	**SFT232**
2 x 40A - 230V AC	1	2	6	**SFT240**
3 x 40A - 400V AC	1	3	4	**SFT340**
4 x 40A - 230V AC	1	4	3	**SFT440**

SFB125

Description	Frame size	Mod. width	Qty.	Cat ref.
Centre OFF changeover switch I-0-II and common point on bottom				
1 x 16A - 230V AC	1	1	12	**SFB116**
1 x 25A - 230V AC	1	1	12	**SFB125**
1 x 32A - 230V AC	1	1	12	**SFB132**
2 x 16A - 230V AC	1	2	6	**SFB216**
2 x 25A - 230V AC	1	2	6	**SFB225**
2 x 32A - 230V AC	1	2	6	**SFB232**

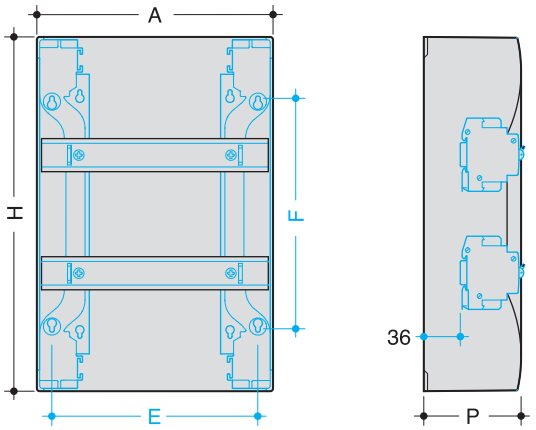
SFH125

Description	Frame size	Mod. width	Qty.	Cat ref.
Changeover switch I-II and common point on top				
1 x 25A - 230V AC	1	1	12	**SFH125**
1 x 32A - 230V AC	1	1	12	**SFH132**
2 x 25A - 230V AC	1	2	6	**SFH225**
2 x 32A - 230V AC	1	2	6	**SFH232**

Description	Frame size	Mod. width	Qty.	Cat ref.
Changeover switch I-II and common point on bottom				
1 x 16A - 230V AC	1	1	12	**SFL116**
1 x 25A - 230V AC	1	1	12	**SFL125**
1 x 32A - 230V AC	1	1	12	**SFL132**
2 x 16A - 230V AC	1	2	6	**SFL216**
2 x 25A - 230V AC	1	2	6	**SFL225**
2 x 32A - 230V AC	1	1	6	**SFL232**

Description	Frame size	Mod. width	Qty.	Cat ref.
Changeover switch I-II				
1 x 25A - 230V AC	1	1	12	**SFM125**
1 x 32A - 230V AC	1	1	12	**SFM132**

Gamma 13

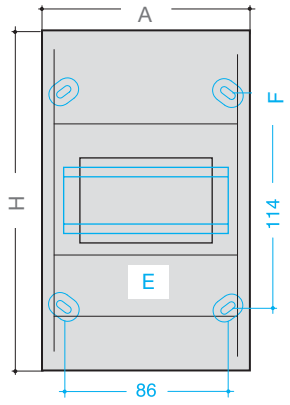


Dimensions

References	Dimensions (mm)			Fixing centers	
	A	H	P	E	F
GD113H	250	250	103	180	177
GD213H	250	375	103	180	302
GD313H	250	500	103	180	427
GD413H	250	625	103	180	552

Note : allow 28 mm extra in width for door opening.

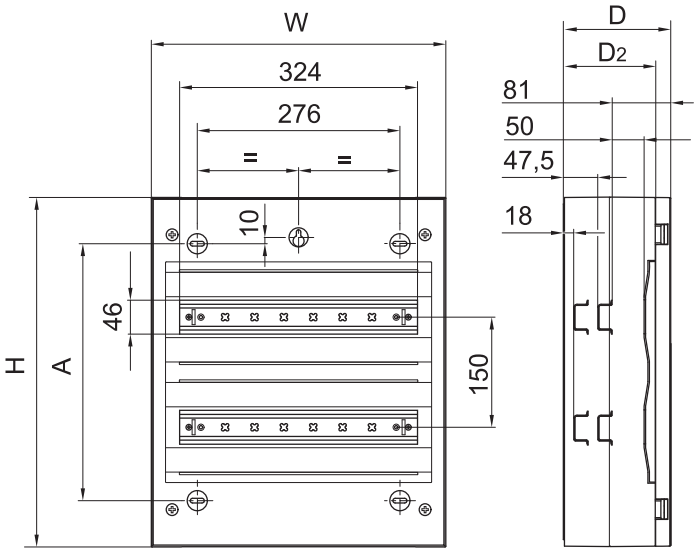
Mini Gamma

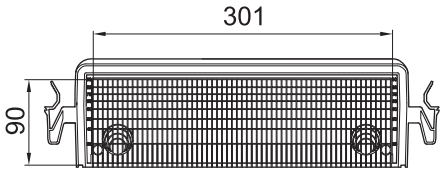


Dimensions

References	Dimensions (mm)			Fixing centers	
	A	H	depth	E	F
GD102E	55	160	82	-	-
GD104E	110	180	82	86	114
GD106E	146	180	82	124	114
GD108E	182	180	82	158	114
GD110E	218	180	82	194	114

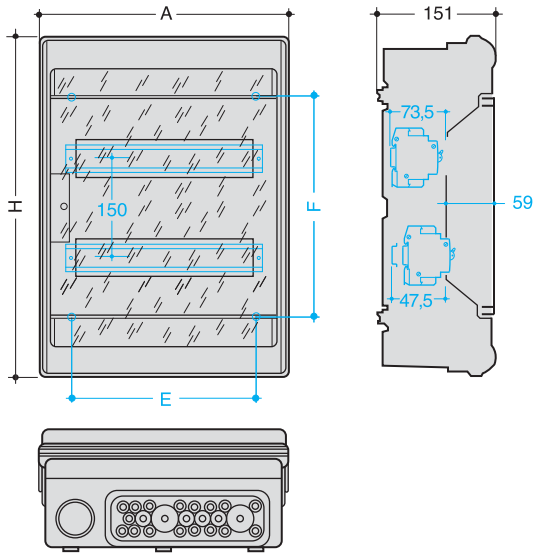
Vega





	A [mm]	H [mm]	W [mm]	D [mm]	D2 [mm]
VB118 W/J	200	325	400	146	126
VB218 W/J	350	475	400	146	126
VB318 W/J	500	625	400	146	126
VB418 W/J	650	775	400	146	126

VE212R - 2 Rows 24 Modules

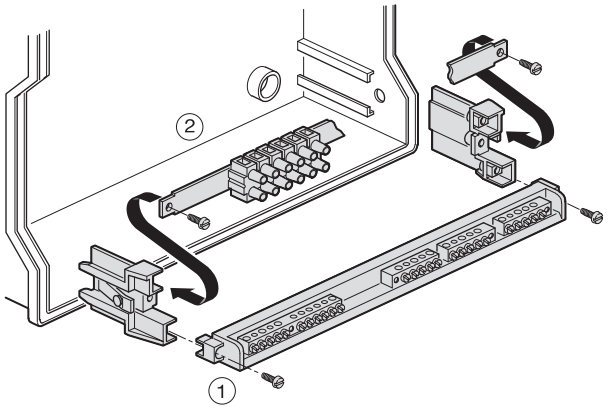


Dimensions in mm

Ref.		R	enclosure dimension		fixing centres	
			A	H	E	F
VE103L	3 ▮	1	111	175	-	147
VE106R	6 ▮	1	165	190	108	158
VE110L	10 ▮	1	237	210	180	173
VE112R	12 ▮	1	310	302	230	155
VE212R	24 ▮	2	310	427	230	280
VE312R	36 ▮	3	310	552	230	405
VE412F	48 ▮	4	310	677	230	550
VE118R	18 ▮	1	418	302	338	155
VE218R	36 ▮	2	418	452	338	305
VE318Y	54 ▮	3	418	602	338	455

Connection assembly

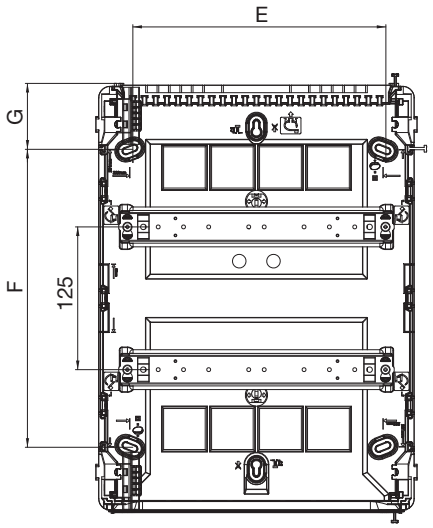
Mounting on insulating support at both end of the chassis
Additional connection assembly : VZ403 or VZ428



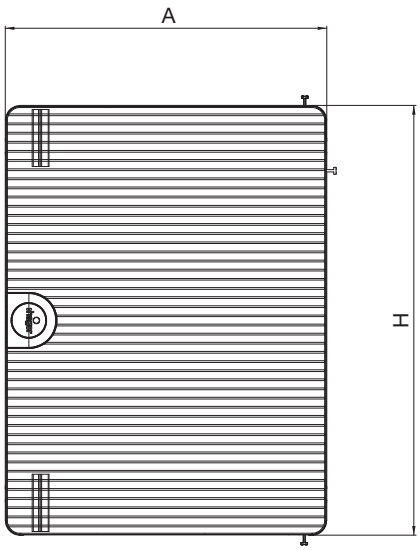
Ref.	knock outs	side mounted
VE103L	2 x M20	-
VE106R	1 x M20 + 1 x M25 + 1 x M20/32	2 x 16
VE110L	1 x M20/32 + 1 x M25 + 3 x M20	2 x 16
VE112R	2 x M20/32/40 + 2 x M25/32 + 3 x M25 + 6 x M20	2 x 21
VE212R	1 x M20/40/50 + 2 x M20/32 + 12 x M25 + 2 x M20	2 x 21
VE312R	2 x M20/32/40 + 2 x M25/32 + 3 x M25 + 6 x M20	3 x 21
VE412F	1 x M20/40/50 + 2 x M20/32 + 12 x M25 + 2 x M20	3 x 21
VE118R	2 x M20/32/40 + 2 x M25/32 + 3 x M25 + 6 x M20	4 x 21
VE218R	1 x M20/40/50 + 2 x M20/32 + 12 x M25 + 2 x M20	4 x 21
VE318R	2 x M20/32/40 + 2 x M25/32 + 3 x M25 + 6 x M20	5 x 21

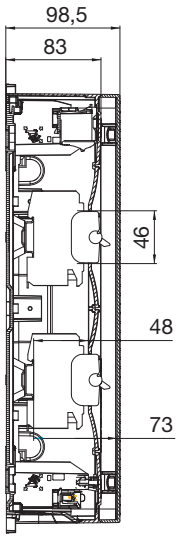
Cable Entries

Cable entries top/bottom
One side cable entry optimised for use of trunking, knockout-type.
The other side pre cuts with diameters 20 mm, 25 mm, 32 mm and 40 mm the wall box is 180° turnable.

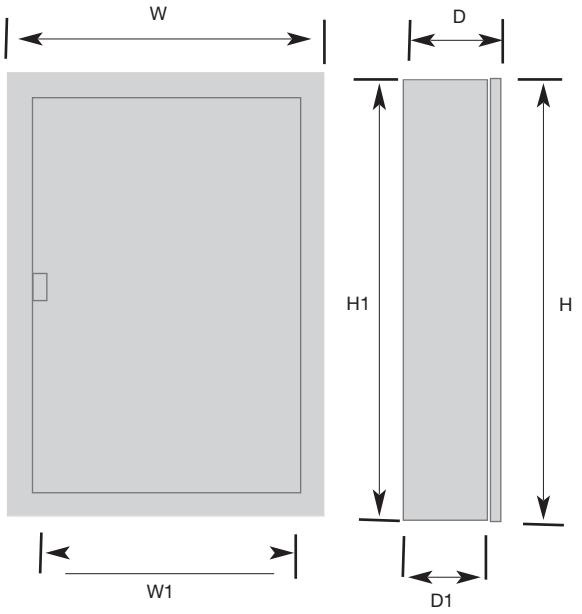


Ref.		Dimension		Wall fixation		
		A	H	E	F	G
VS104...	1 row 4 ▮	137,5	183,5	101	68	58
VS108...	1 row 8 ▮	209,5	183,5	173,5	68	58
VS112...	1 row 12 ▮	281,5	251,5	221,5	135,5	58
VS212...	2 row 12 ▮	281,5	376,5	221,5	260,5	58
VS312...	3 row 12 ▮	281,5	500	221,5	385,5	58
VS412...	4 row 12 ▮	281,5	646,5	221,5	491	58
VS118...	1 row 18 ▮	389,5	251,5	329,5	135,5	58
VS218...	2 row 18 ▮	389,5	376,5	329,5	260,5	58
VS318...	3 row 18 ▮	389,5	500	329,5	385,5	58
VS418...	4 row 18 ▮	389,5	646,5	329,5	491	58
VS122...	1 row 22 ▮	461,5	251,5	401,5	135,5	58



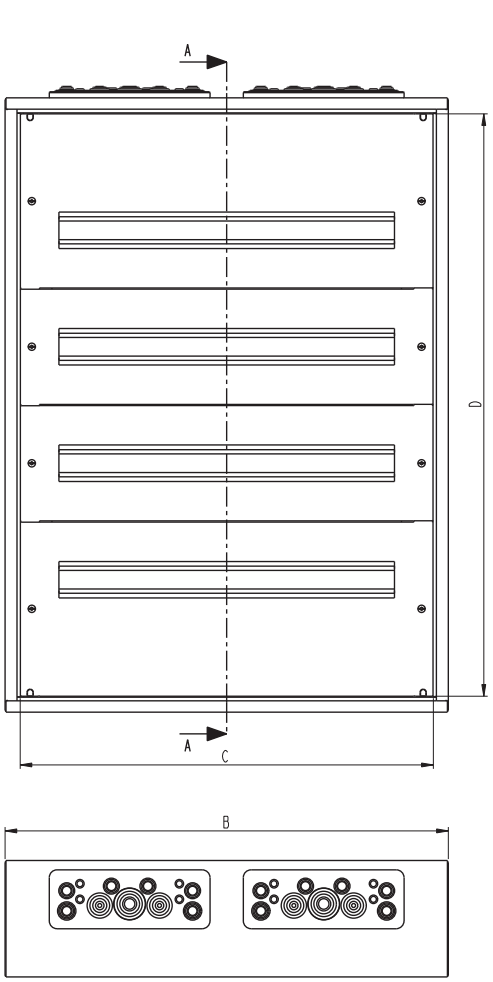


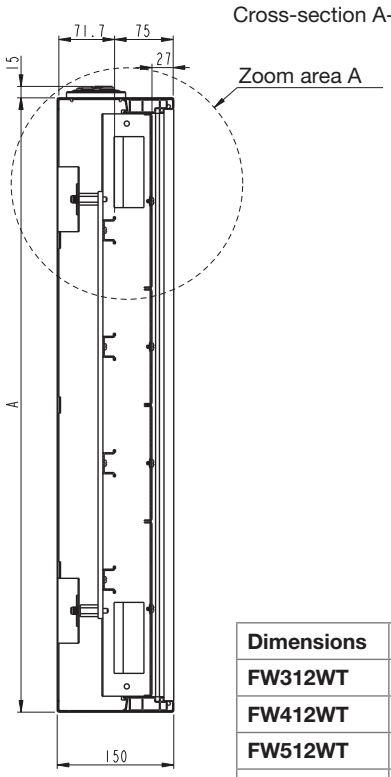
DR Metal Enclosure (surface)

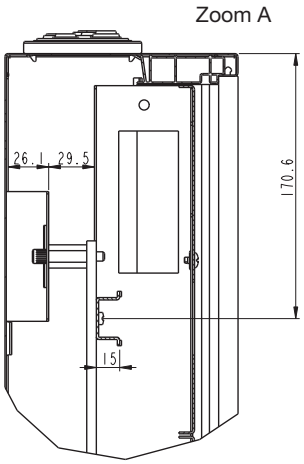


Reference	H	W	H1	W1	D1
DR16S	325	405	320	400	110
DR32S	475	405	470	400	110

FW2 Metal Enclosure (surface)







Dimensions	A	B	C	D
FW312WT	641	355	314	600
FW412WT	791	355	314	750
FW512WT	941	355	314	900
FW612WT	1091	355	314	1050
FW324WT	641	571	530	600
FW424WT	791	571	530	750
FW524WT	941	571	530	900
FW624WT	1091	571	530	1050
FW436WT	791	787	746	750
FW536WT	941	787	746	900
FW636WT	1091	787	746	1050
FW736WT	1241	787	746	1200

FW Metal Enclosures General Description

Surface mounting enclosures for domestic and commercial electrical distribution.

Included in delivery :
- enclosures with door,
- carrier rails with complete board,
- device covers with 46mm slots, with complete board,

Complies with Standards :
IEC 61 439-3

Nominal Voltage:
AC 230/400V, 50Hz

Current rating:
for devices up to 125A

Protection class:
II (insulation protected)

IP rating:
IP44

Protection details:
Protection against direct contact: IP3X behind the door
Protection with indirect contact: insulation protection

Door :
frontal fastening, with internal hinges, all adjustable, removable without tools, optionnally attachable on right or left, width from 800mm double door, opening angle 110°.

Door lock :
twist release lock, exchangeable with other locks, 3 point bar locks on double door cabinet.

Quick Connect Terminals or brass terminals :
(according the versions) :
please contact us

Colour :
RAL 9010 (pure white)

Cable entries :
cable entry plates top and bottom made of plastic to feed in the cable from the front.

Material :
Housing and door made of steel, powder coated.

Carrier rails :
Steel, powder coated.

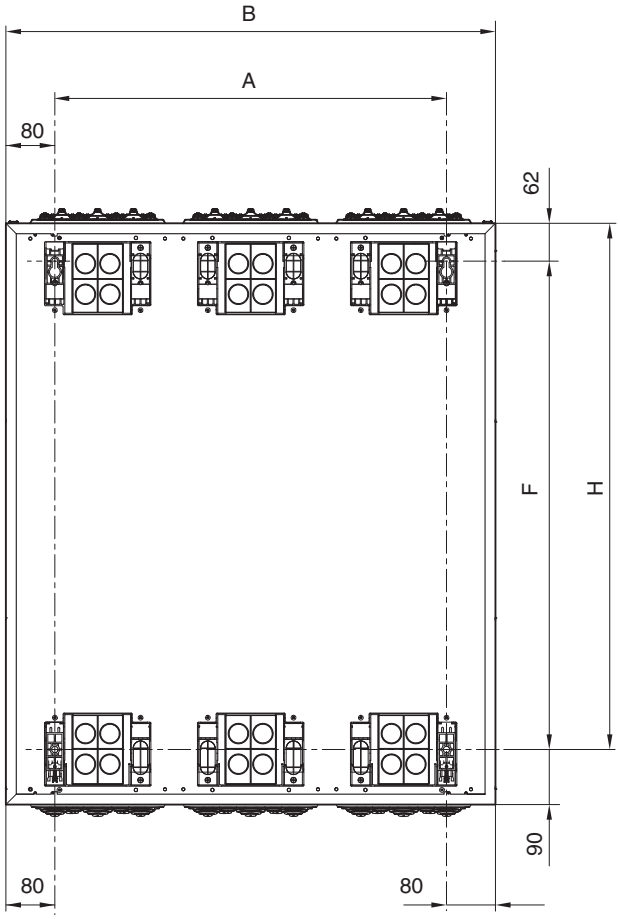
Supports :
Plastic

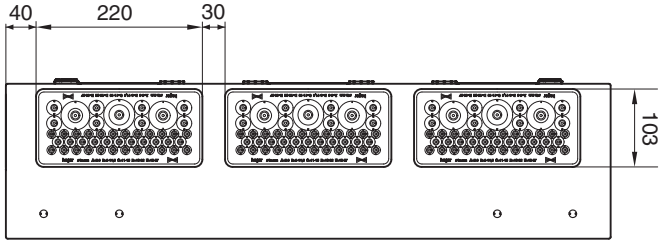
Device rails :
Steel, galvanised

Covers and knockouts :
Plastic

	height (mm)	width (mm)	depth (mm)	DIN rails (12 z)	fields across	No of modules	IP class (standard)
FWB31	500	300	161	3	1	36	IP44
FWB32		550	161	3	2	72	IP44
FWB33		800	161	3	3	108	IP44
FWB34		1050	161	3	4	144	IP44
FWB41	650	300	161	4	1	48	IP44
FWB42		550	161	4	2	96	IP44
FWB43		800	161	4	3	144	IP44
FWB44		1050	161	4	4	192	IP44
FWB51	800	300	161	5	1	60	IP44
FWB52		550	161	5	2	120	IP44
FWB53		800	161	5	3	180	IP44
FWB54		1050	161	5	4	240	IP44
FWB61	950	300	161	6	1	72	IP44
FWB62		550	161	6	2	144	IP44
FWB63		800	161	6	3	216	IP44
FWB64		1050	161	6	4	288	IP44
FWB71	1100	300	161	7	1	84	IP44
FWB72		550	161	7	2	168	IP44
FWB73		800	161	7	3	252	IP44
FWB74		1050	161	7	4	336	IP44

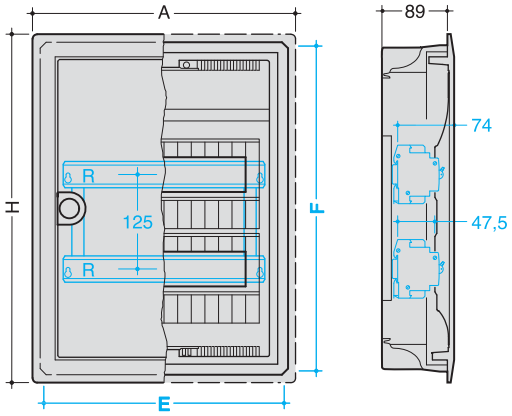
FWB surface enclosures





Ref.	dimensions			
	H	B	A	F
FWB31	500	300	348	140
FWB32	500	550	348	390
FWB33	500	800	348	640
FWB34	500	1050	348	890
FWB41	650	300	498	140
FWB42	650	550	498	390
FWB43	650	800	498	640
FWB44	650	1050	498	890
FWB51	800	300	648	140
FWB52	800	550	648	390
FWB53	800	800	648	640
FWB54	800	1050	648	890
FWB61	950	300	798	140
FWB62	950	550	798	390
FWB63	950	800	798	640
FWB64	950	1050	798	890
FWB71	1100	300	948	140
FWB72	1100	550	948	390
FWB73	1100	800	948	640
FWB74	1100	1050	948	890

VU24IE - 2 rows 24 modules



Dimensions in mm

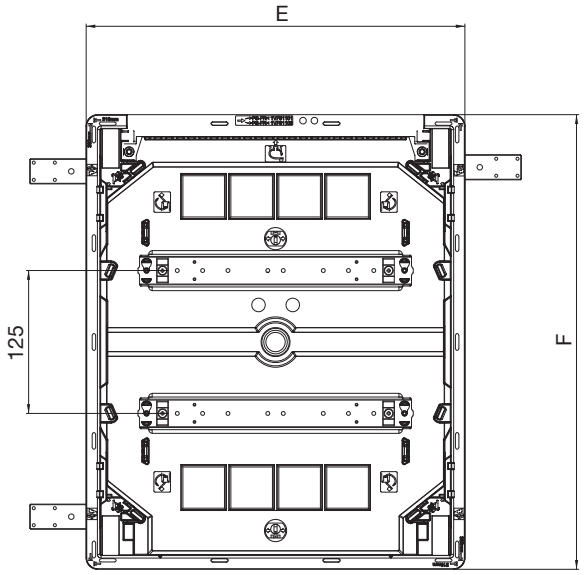
Ref.		R	Enclosure dimension		Wall box hollow wall	
			A	H	E	F
VU12IE	12 ▮	1	348	356	315	322
VU24IE	24 ▮	2	348	505	315	471
VU36IE	36 ▮	3	348	630	315	596
VU48IE	48 ▮	4	348	755	315	721

Cable Entries

Top/bottom
One side cable entry slide, knockout-type, (VF104... and VF108...). The other side pre cuts with diameters 20 mm, 25 mm, 32 mm and 40 mm the wall box is 180° turnable (slider can be placed at top or bottom).

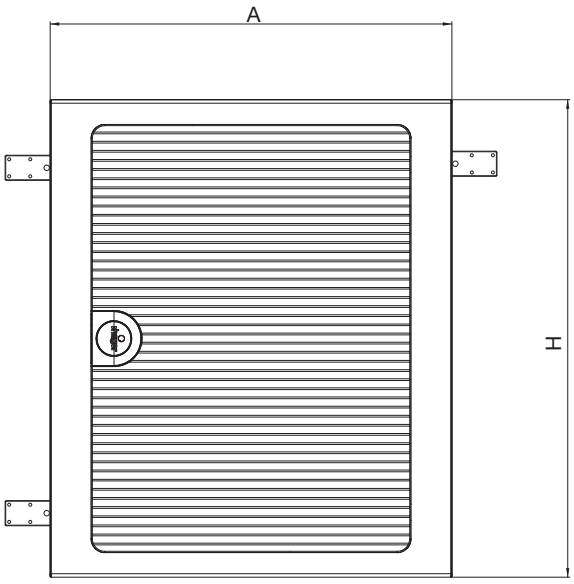
Side
Each one knockout Ø 25 mm on the left and right in the upper and lower connection space.

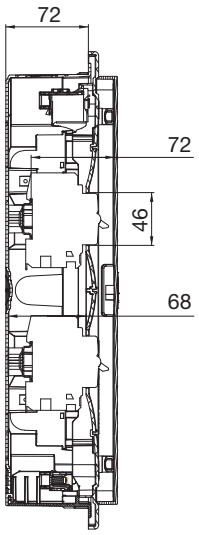
As of 2 rows, knockouts Ø 25 mm on the left and right between the device rows. (no knockouts at 4 and 8 module enclosures).

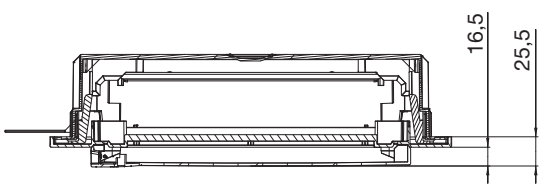


Ref.		Dimension (mm)			
		Frame		Wall niche	
		A	H	E	F
VF104...	1 row 4 ▮	204	225	170	189
VF108...	1 row 8 ▮	275	225	242	189
VF112...	1 row 12 ▮	352	293	318	257
VF212...	2 row 12 ▮	352	418	318	382
VF312...	3 row 12 ▮	352	543	318	507
VF412...	4 row 12 ▮	352	688	318	652
VF118...	1 row 18 ▮	460	293	426	257
VF218...	2 row 18 ▮	460	418	426	382
VF318...	3 row 18 ▮	460	543	426	507
VF418...	4 row 18 ▮	460	688	426	652
VF122...	1 row 22 ▮	532	293	498	257

For the wall niche, these dimensions are minimal.







General Description

Flush mounting enclosures for domestic and commercial electrical distribution.

Included in delivery :
- enclosures with door,
- carrier rails with complete board,
- device covers with 46mm slots, with complete board,
- comes fitted with quickconnect

Quick Connect Terminals in complete boards or with brass terminals (according the versions)

Complies with Standards :
IEC 61 439-3

Nominal voltage:
AC 400V / 50Hz

Current rating:
for devices up to 125A

Protection class:
II (insulation protected)

IP rating:
IP30

Protection details:
Protection against direct contact: IP3X behind the door
Protection with indirect contact: insulation protection

Door :
frontal fastening, with internal hinges, all adjustable, removable without tools, optionnally attachable on right or left, width from 800mm double door, opening angle 110°.

Door lock :
twist release lock, exchangeable with other locks, 3 point bar locks on double door cabinet.

Quick Connect Terminals :
built in per field to every complete board quickconnect

Colour :
RAL 9010 (pure white)

Cable entries :
cable entry plates top and bottom made of plastic to feed in the cable from the front.

Material :
Housing and door made of steel, powder coated.

Carrier rails :
Steel, powder coated.

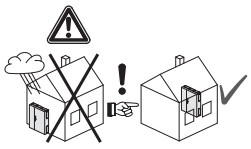
Supports :
Plastic

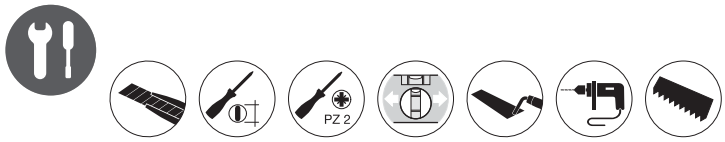
Device rails :
Steel, galvanised

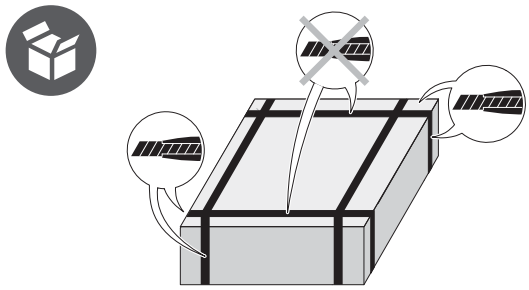
Covers and knockouts :
Plastic

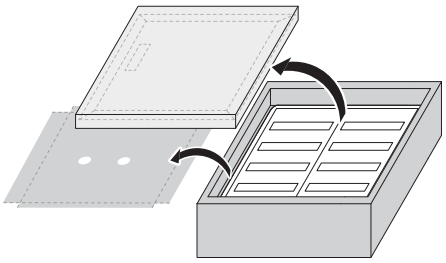
	height (mm)	width (mm)	depth (mm)	DIN rails (12 z)	fields across	Nr of modules	IP class (standard)
FWU31S	500	300	112	3	1	36	IP30
FWU32S		550	112	3	2	72	IP30
FWU33S		800	112	3	3	108	IP30
FWU41S	650	300	112	4	1	48	IP30
FWU42S		550	112	4	2	96	IP30
FWU43S		800	112	4	3	144	IP30
FWU51S	800	300	112	5	1	60	IP30
FWU52S		550	112	5	2	120	IP30
FWU53S		800	112	5	3	180	IP30
FWU61S	950	300	112	6	1	72	IP30
FWU62S		500	112	6	2	144	IP30
FWU63S		800	112	6	3	216	IP30
FWU71S	1100	300	112	7	1	84	IP30
FWU72S		550	112	7	2	168	IP30
FWU73S		800	112	7	3	252	IP30

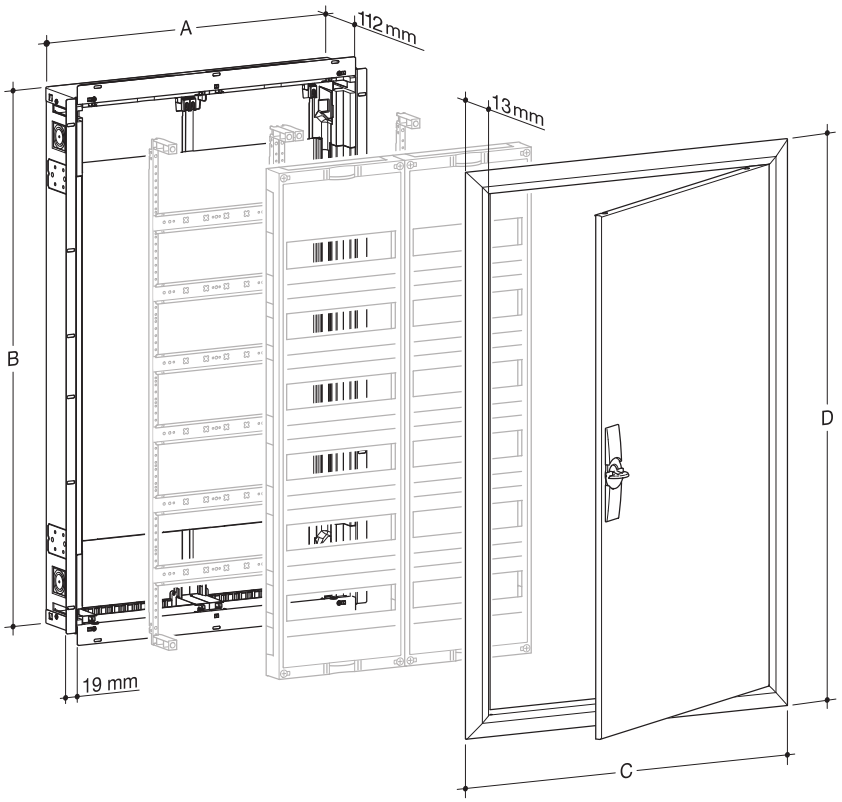
FW Flush Enclosures - Mounting instructions

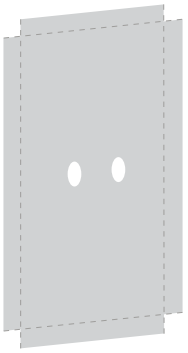


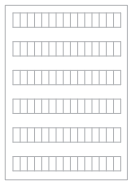






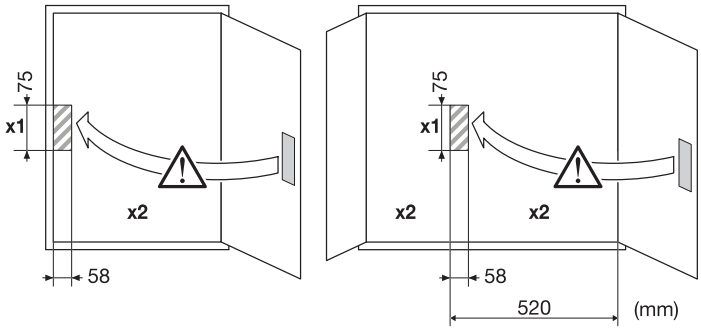




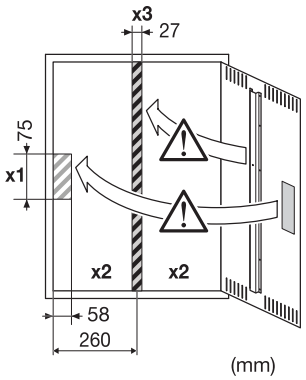


	A (mm)	B (mm)	C (mm)	D (mm)
FWU31..	310	502	353	553
FWU32..	560	502	603	553
FWU33..	810	502	853	553
FWU41..	310	652	353	703
FWU42..	560	652	603	703
FWU43..	810	652	853	703
FWU51..	310	802	353	853
FWU52..	560	802	603	853
FWU53..	810	802	853	853
FWU61..	310	952	353	1003
FWU62..	560	952	603	1003
FWU63..	805	952	853	1003
FWU71..	310	1102	353	1153
FWU72..	560	1102	603	1153
FWU73..	810	1102	853	1153

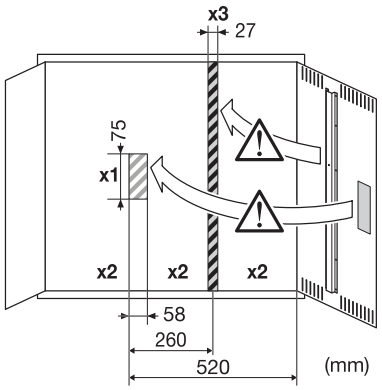
FWU31, 41, 51, 61, 71... FWU33, 43...

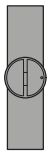
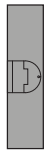


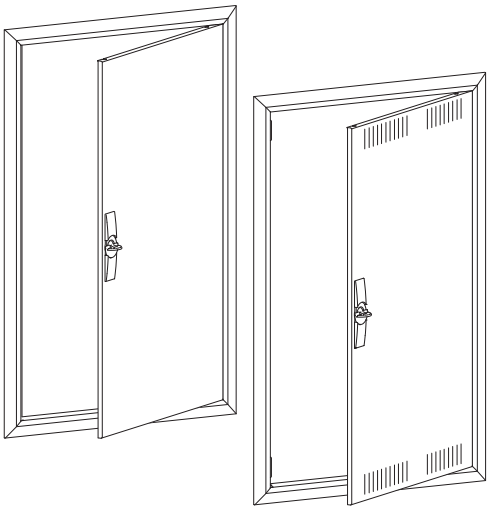
FWU52, 62, 72...

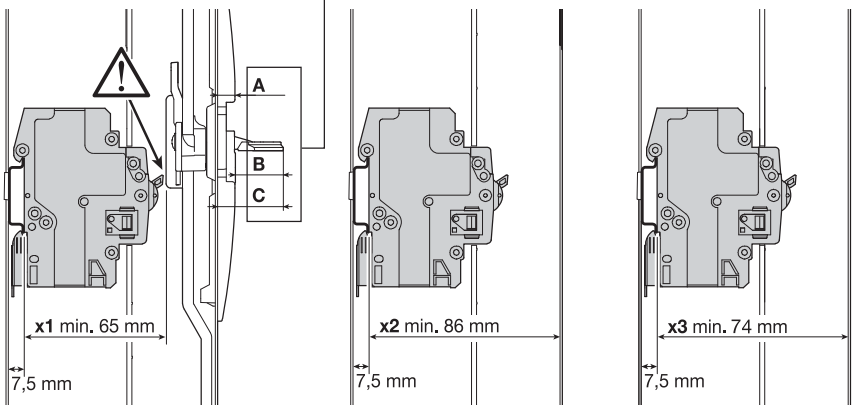


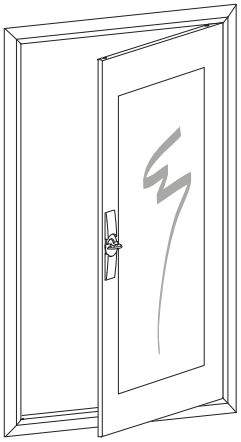
FWU53, 63, 73...

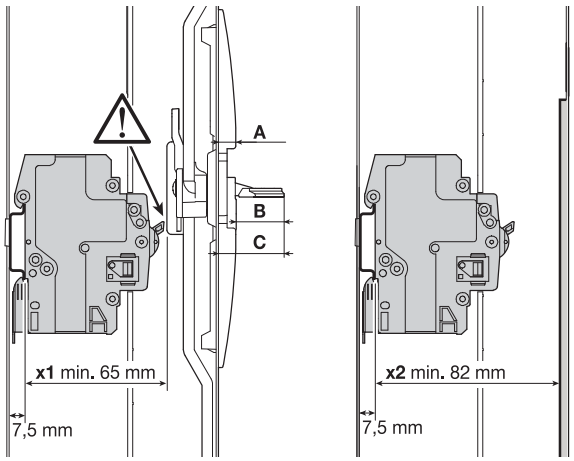


		A (mm)	B (mm)	C (mm)
FZ598N		8,5	23	31,5
FZ598		6	17	23

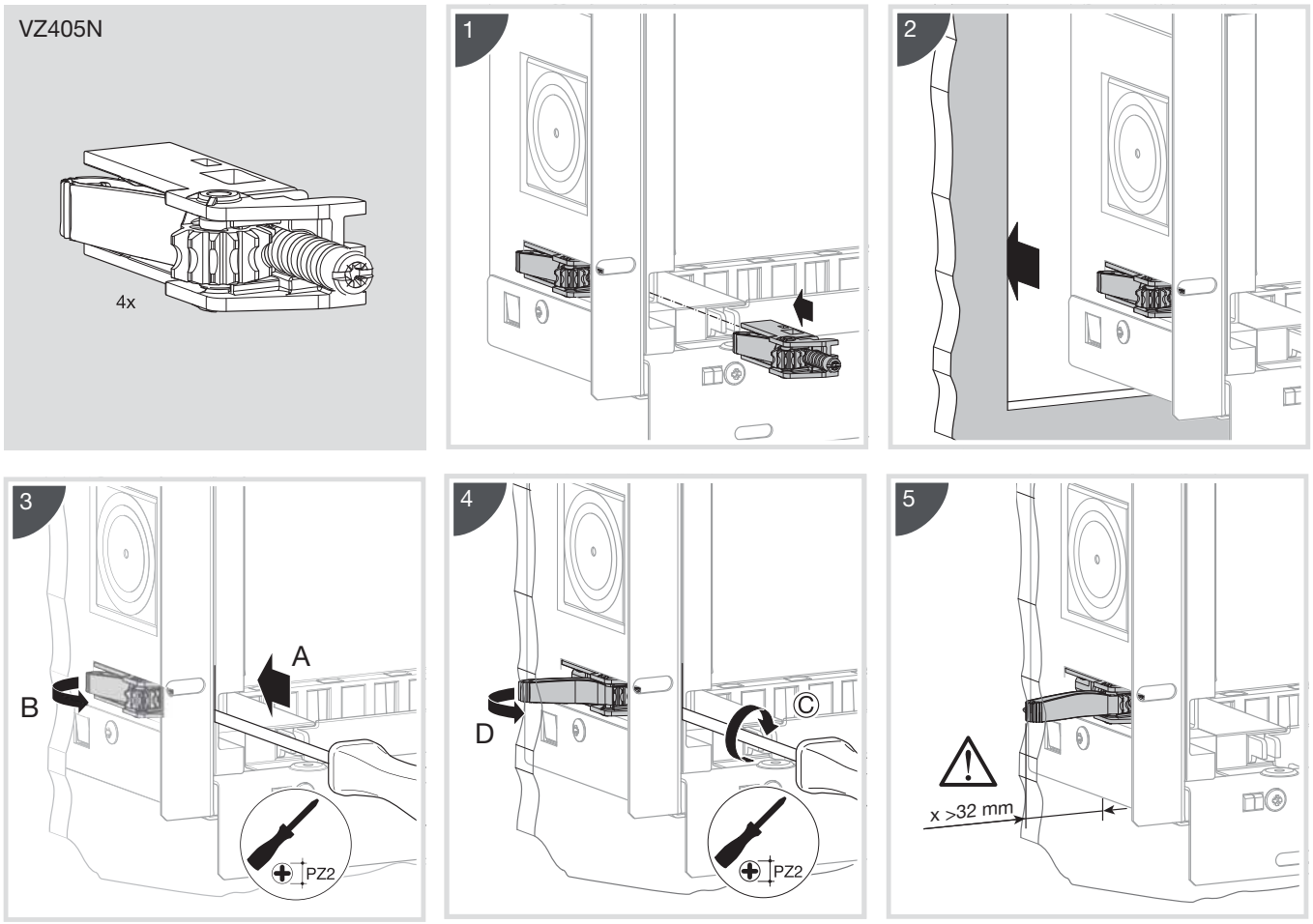








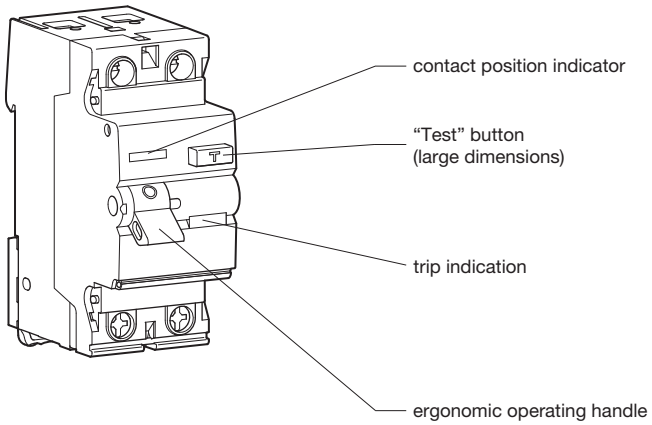
Mounting Hollow Wall Anchor Accessory



Mounting the VZ405N hollow wall anchor in wall cabinets.

Keeping space free around the sides in the wall cavity
To mount the VZ405N hollow wall anchor, a minimum distance of 32 mm must be kept free around the sides so that the hollow wall anchor can be flipped forward unhampered.

RCCBs



Contact positioning indicator

The mechanical indicator on the front of RCCB shows the physical position of the contacts.
- Red indication for closed contacts
- Green indication for open contacts

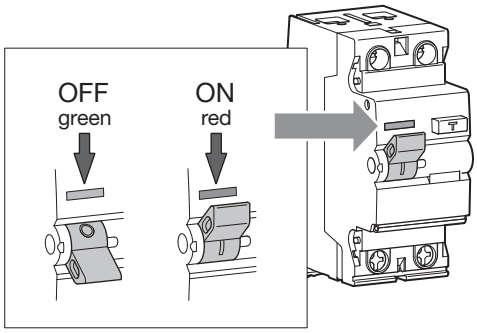
The green indication is the guarantee that the contacts are open and that the terminals are not live.

Trip indicator

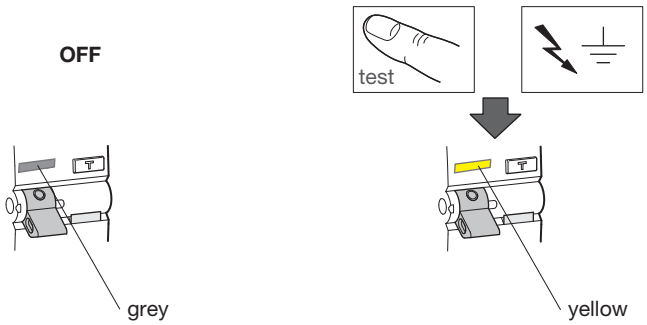
The status of the RCCB can be visualised by the colour of the trip indicator in addition to the position of the operating lever.
- Grey indication for normal conditions (even when operating lever is in ON/OFF position)
- Yellow indication for tripped condition, operating lever in OFF position.

Similar condition exists when TEST button is pushed or RCCB is remotely tripped via protection auxiliaries.

Positive contact indication



Earth leakage fault indication



Residual Current Devices

A residual current device (RCCB) 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.

For fixed domestic installations and similar applications we have two types :
- Residual current operated circuit-breaker without integral over-current protection (RCCBs) which should comply with the requirements of IEC 61 008
- Residual current operated circuit-breaker with integral over-current protection (RCBOs) which should comply with the requirements of IEC 61 009

Both RCCBs and RCBOs are further divided into types depending on their operating function :

Type AC For which tripping is ensured for residual sinusoidal alternating currents, whether suddenly applied or slowly rising. Marked with the symbol:

Type A For which tripping is ensured for residual sinusoidal alternating currents and residual pulsating direct currents, whether suddenly applied or slowly rising. Marked with the symbol:

Type S For selectivity, with time-delay. Marked with the symbol:

RCCBs must be protected against short-circuits by means of circuit-breakers or fuses. RCBOs have their own in built short-circuit protection, up to it's rated value.

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

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

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

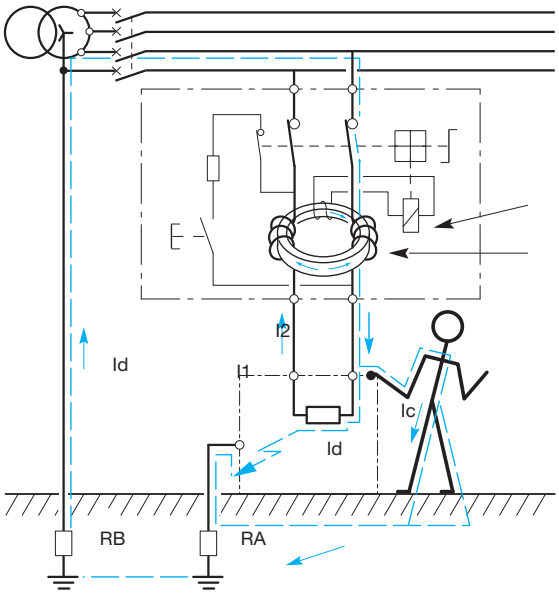
RCCBs work just as well on three phase or three phase and neutral circuits, but when the neutral is distributed it must pass through the torroid.

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

RCCBs – domestic installation
RCCBs can be installed in two ways:

1. whole house protection.
2. selective protection.

Principle



Current flowing through torroid in healthy circuit

$$I_{res} = I_1 - I_2 = 0$$

Current flowing through torroid in circuit with earth fault I_3

$$I_{res} = I_1 - I_2 + I_3 = I_3$$

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

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

Individual RCBO
Each separate final circuit requiring protection by a RCD can be supplied through an RCBO. This method provides the best solution for minimising inconvenience.

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

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

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

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

Use of RCCBs

RCCBs offer excellent protection against earth fault currents; the main areas of application being as follows:

- Zs value too high to allow disconnection in the required time

Where the overcurrent protection or a circuit breaker cannot provide disconnection within the specified time because the earth fault loop impedance is too high the addition of RCCB protection may well solve the problem without any other change in the system. Because of its high sensitivity to earth fault current and its rapid operating time, in most cases the RCCB will ensure disconnection within the specified time. This is achieved without any detriment to overcurrent discrimination because, unlike the situation in a fuse based system, the increased sensitivity is obtained without increasing sensitivity to overcurrent faults. Use of RCCBs in this way can be particularly useful for construction sites and bathrooms where disconnection times are more stringent than for standard installations. (Construction sites - 0.2s at 220-277V, bathrooms - 0.4s).

The limitation to this technique is the requirement that the rated residual operating current multiplied by Zs should not exceed 50V. This is to avoid the danger of exposed conductive parts reaching an unacceptably high Voltage level.

Residual current protection can even be added to a completed distribution system where the value of Zs is excessive, either because of a design oversight or subsequent wiring modification.

- Protection against shock by direct contact

So far we have considered shock by indirect contact only.
Direct contact is defined thus:

Direct contact - contact of persons or livestock with live parts which may result in electric shock. The consideration here is not the hazard of parts becoming live as a result of a fault but the possibility of touching circuit conductors which are intentionally live.

RCCBs, although affording good protection against the potentially lethal effects of electric shock, must not be used as a the sole means of protection against shock by direct contact. The Electricity at Work Act recommends the use of RCCBs, "....danger may be reduced by the use of a residual current device but states that this should be "....considered as a second line of defence". The Wiring Regulations defines the other measures that should be taken i.e.

- insulation of live parts.
- barriers or enclosures.
- obstacles.
- placing live parts out of reach.

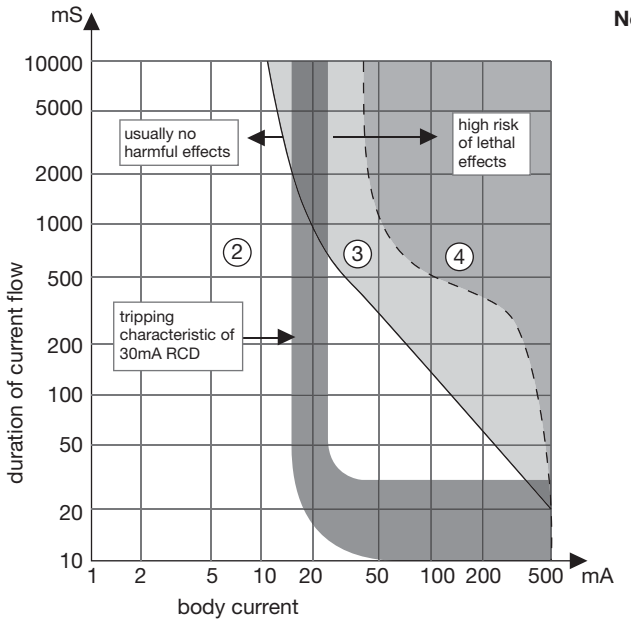
Additionally an RCCB used for this purpose should have:

- a sensitivity of 30mA
- an operating time not exceeding 40mS at a residual current of 150mA.

The specified sensitivity is based on research that has been carried out to estimate the effect various levels and duration of current can have on the human body. This experience is summarised in a graph shown in 'IEC 479-1: Effects of current passing through the human body'. A simplified version of this graph is shown opposite. It shows that very small currents can be tolerated for reasonably long periods and moderate currents for very short periods. It can be seen, for instance, that 100mA for 100mS or 20mA for 500mS will not normally cause any harmful effect. 200mA for 200mS or 50mA for 500mS which are in Zone 3, would be more dangerous; and shock levels in Zone 4 carry a risk of lethal consequences.

The tripping characteristic for a 30mA RCCB is also shown in the graph. It shows the level of current required to cause the RCCB to trip, for example; 50mA will cause a trip but not 10mA. Comparing its characteristic with the various zones on the graph it can be seen that the 30mA RCCB gives a very good measure of protection against the hazards associated with electric shock. Where a higher level of protection is required, for example in laboratories, 10mA devices are available.

IEC 60 479-1



Note :

Although RCCBs are extremely effective devices they must never be used as the only method of protection against electric shock. With or without RCCBs protection all electrical equipment should be kept in good condition and should never be worked on live.

Protection against shock outside the equipotential bonding zone

Bonding conductors are used in an installation to maintain metallic parts, as near as possible, to the same potential as earth. Working with portable equipment outside this equipotential bonding zone, e.g. in the car park of a factory, introduces additional shock hazards. Socket outlets rated 32A or less 'which may be reasonably expected to supply portable equipment for use outdoors' should have at least one socket nominated for outdoor use. This socket should be equipped with 30 mA RCCB protection unless fed from an isolating transformer or similar device, or fed from a reduced Voltage.

Protection in special situations
The use of RCCBs is obligatory or recommended in the following situations:

- caravans: 30mA RCCB should be used.
- TT systems.
- swimming pools: 30mA RCCB for socket outlets in Zone B obligatory; recommended in Zone C.
- agricultural and horticultural: 30mA RCCB for socket outlets and for the purpose of protection against fire, RCCB ≤ 0.5A sensitivity.
- construction sites: 30mA RCCB recommended.

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

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

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

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

Auxiliary contacts
A range of auxiliaries, alarm and shunt contacts are available for Hager RCCBs.

Supply entry
Top or bottom feed.

Auxiliaries for MCBs & RCCBS

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

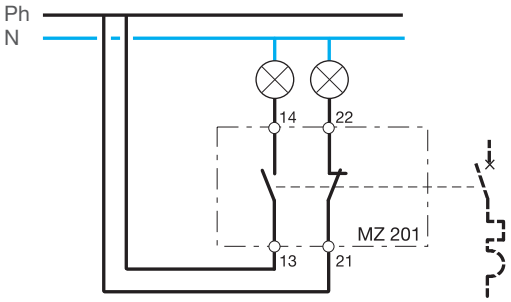
Auxiliary Contact and Alarm Contact MZ202
This accessory has two separate functions.
Like the MZ201 auxiliary contact, however the alarm contact will provide indication if the breaker trips under fault conditions.

MZ203 Shunt Trip*
Allows tripping of the device by feeding the coil. The contacts also allow for remote indication of operation.

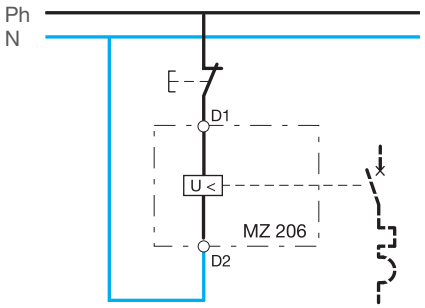
MZ206 Under Voltage Release*
Allows the MCB to trip when the Voltage drops or by pressing a remote off switch (ie emergency stop).

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

Wiring diagram
MZ201 auxiliary contact or MZ202 alarm contact



MZ206 under Voltage release



Electrical characteristics

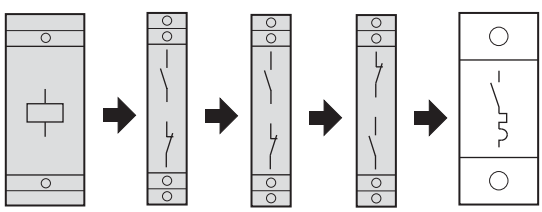
	MZ201/MZ206	MZ203	MZ206
	1 x O 1 x C contact 230V AC 6A - AC1		
		230/415 V AC 110/130 ...	230V AC 50 Hz

Electrical connection
By terminal fitted with fixed clamp screws wiring capacity.
Flexible : 2 x 1.5mm2
Rigid : 2 x 1.5mm2

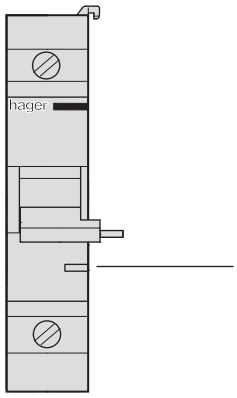
MZ203
Power - 8VA
tolerance : -15% of Un

MZ206
Latching Voltage is between 35 and 70% of Un 230V AC
Coil consumption 3VA

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).



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



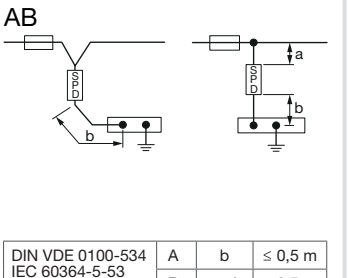
Flag indicating that the product has tripped due to the Voltage release

MZ203 to MZ212

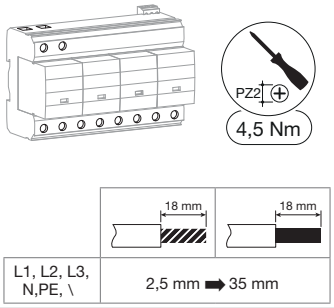
Residential Distribution

		SPA801
Tested to		EN 61643-11, IEC 61643-11
SPD type / class		Type 1 + Type 2 Class 1 + Class 2
Nominal voltage	U_n	240/415V (6=50/60 Hz) Tolerance: 0V...Uc
Rated voltage	U_c	350V (50/60 Hz)
Voltage protection level	U_p	≤ 1.5kV
Residual current	I_{PE}	≤ 0.01mA
Impulse current (10/350) TNS	I_{imp}	25kA (L-N-PE) 100kA (L1,L2,L3,N -PE)
Impulse current (10/350) TNS	I_{imp}	25kA (L-N) 100kA (L1, L2,L3, N -PE)
Short Circuit Current Rating	I_{sccr}	50kA$_{rms}$
Rated load current	I_{fi}	50kA $_{rms}$
TNS,TT (serial/parallel)		OK
IT, TNC		~~OK~~
F1 max (serial)		125 A gG
F1 max (Parallel)		315A gG
Humidity		5%...95%
9°C		-40/+80°C (+60°C by serial connection)
Ports		1
IP Code		20 (built in)
LxWxH		95 mm x 143 mm x 74mm

Connection

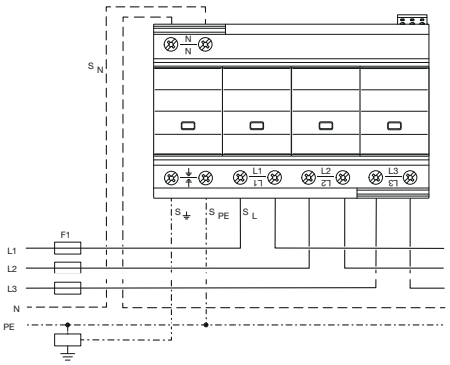


DIN VDE 0100-534 IEC 60364-5-53	A	b	≤ 0,5 m
	B	a + b	≤ 0,5 m



L1, L2, L3, N,PE, \	2,5 mm ➡ 35 mm

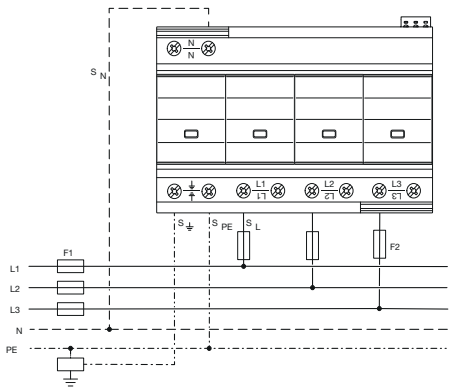
TT/TNS Serial Wiring



F1 gG	
F1	F1 ≤ 125 A ⬇ OK
	F1 > 125 A ⬇ TNS parallel

F1 A gG	$S_L = S_N$ mm²	$S_{\downarrow}$ mm²	$S_{PE(N)}$ mm²
40	61	66	
50 63	10 10	16 16	10 10
80	16	16	16
100	25	16	16
125	35	16	16

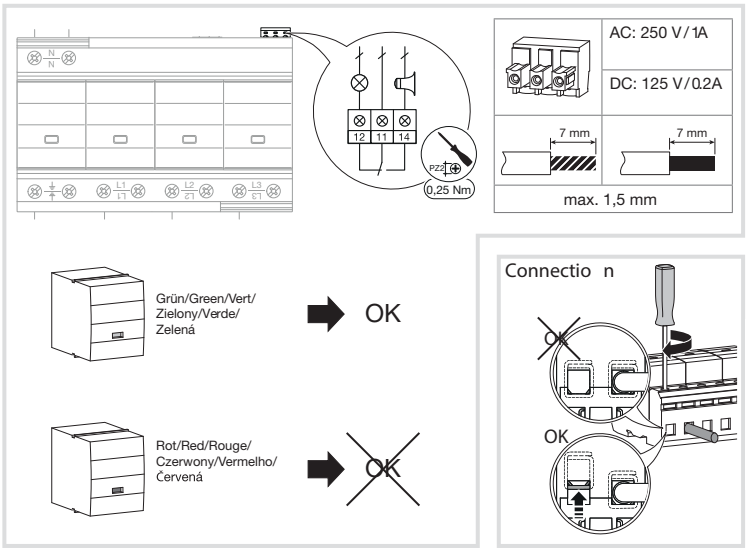
TT/TNS Parallel Wiring



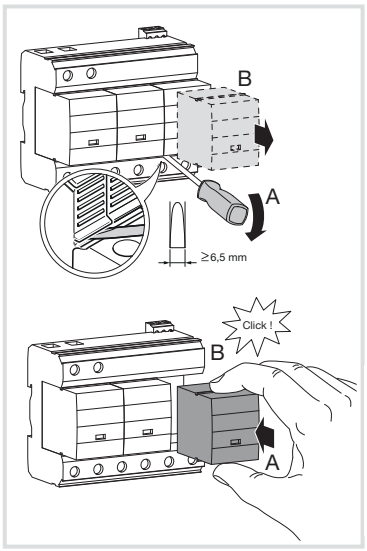
F1 - F2 gG	
F1	F1 > 315A ⬇ F2 ≤ 315 A
F2	F1 ≤ 315 A ⬇ ~~F2~~

F1 A gG	F2 A gG	$S_L = S_N$ mm²	$S_{PE(N)}$ mm²	$S_{\downarrow}$ mm²
40 50 63		6 6 6	6 6 6	16 16 16
80 100		10 10	10 10	16 16
125 160		16 16	16 16	16 16
200		25	25	16
250 315		35 35	35 35	16 16
400 ≥500	≤250 ≤315	35 35	35 35	16 16

Fault Indication



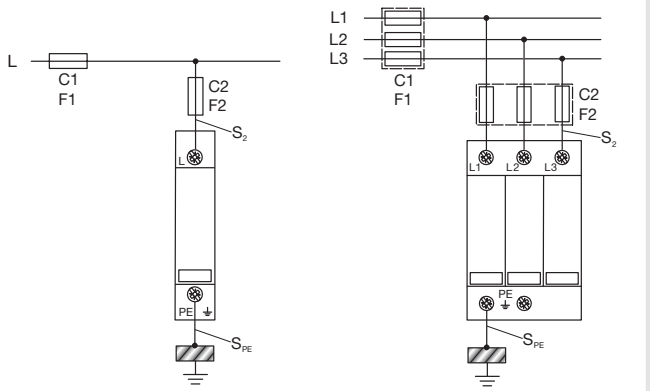
SPA081 SPA001N



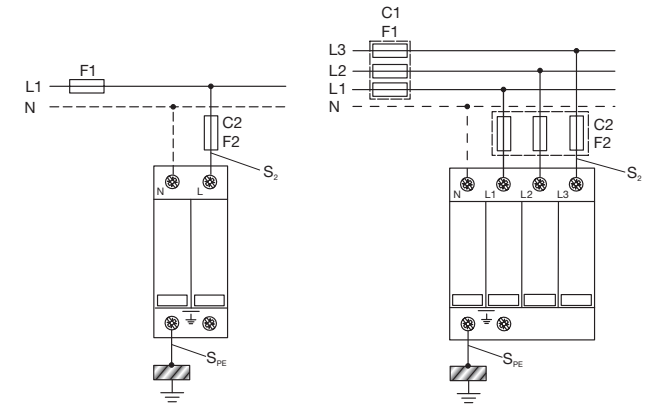
		SPBX15D/R	SPBX40D/R	SPBX65R
Tested to		EN 61643-11, IEC 61643-11		
TT/TN/TNC-S		OK		
Nominal voltage	U_n	240/415V (50/60Hz)		
Residual current (N-PE)	I_{PE}	<5µA (SPB2xxx,SPB4XXX) <0.4mA (SPB1XXX, SPB3XXX)		
Rated loaded current	I_{fi}	$100A_{rms}$		
Humidity		5% …95%		
9°C		-40/+80°C		
Ports		1		
IP Code		20 (built in)		
Rated voltage	U_c	275V (L-N); 260V (N-PE) 320V (L-N); 264V (N-PE)-SPBX65R		
Nominal discharge current (8/20 µs)	I_n	5kA	20kA	20kA
Maximum discharge current (8/20 µs)	I_{max}	15kA	40kA	65kA
Voltage protection level	U_p	≤1kV	≤1.35kV	≤1.45kV
C2 max. hager		32A "C"	32A "C"	63A "C"
F2 max		125A gG	125A gG	160A gG
Short circuit current rating	I_{sccr}	25 kA_{rms}	25 kA_{rms}	25 kA_{rms}
Replacement cartdridge L-N		SPB015D	SPB040D	SPB065R
Replacement Cartdridge N-PE		SPB040N	SPB040N	SPB065N

	L x W x H (mm)	L x W x H (mm)
	Imax = 15 kA, 40 kA	Imax = 65 kA
1P	65.7 x 17.5 x 98.7	77.5 x 17.5 x 98.7
2P	65.7 x 35.6 x 98.7	77.5 x 35.6 x 98.7
3P	65.7 x 53 x98.7	77.5 x53 x 98.7
4P	65.7 x 71 x98.7	77.5 x 71 x 98.7

1P - 3P (TN-C)



2P - 4P (TN-S/TT)



Backup fuse			
		SPBx15D/R SPBx40D/R	SPBx65R
F1		F1 >125 A gG ⬇ F2 ≤ 125 A gG	F1 >160 A gG ⬇ F2 ≤ 160 A gG
F2		F1 ≤ 125 A gG ⬇ ~~F2~~	F1 ≤ 160 A gG ⬇ ~~F2~~

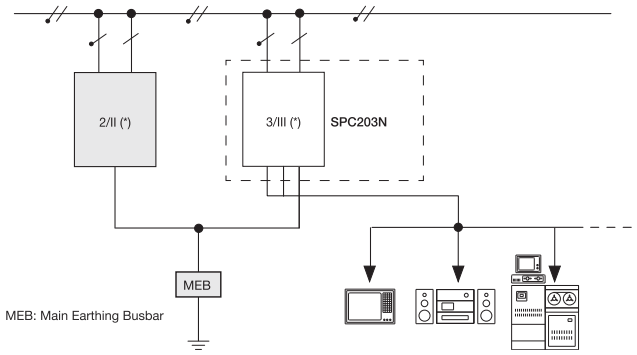
Backup MCB* (Isc = 10 kA)			
		SPBx15D/R SPBx40D/R	SPBx65R
C1		C1 >32A "C" ⬇ C2 ≤ 32A "C"	C1 >63A "C" ⬇ C2 ≤ 63A "C"
C2		C1≤ 32A "C" ⬇ ~~C2~~	C1≤ 63A "C" ⬇ ~~C2~~

Type			SPBx15x SPBx40x	SPBx65R
F1 A/gG	S_2 mm²	S_{PE} mm²	F2 A/gG	F2 A/gG
25	6	6	-	-
35	6	6	-	-
40	6	6	-	-
50	6	6	-	-
63	10	10	-	-
80	10	10	-	-
100	16	16	-	-
125	16	16	-	-
160	25	25	125	-
>160	25	25	125	160

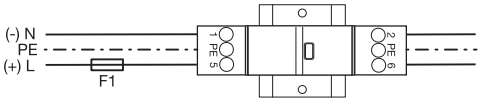
Characteristics

Tested to		EN 61643-11, IEC 61643-11
System		TNS-TT
F1 max		25A/32A (gG/B/C)
Nominal discharge current (8/20 µs)	I_n	L(N)/PE, L/N = 5kA
Short circuit current rating	I_{sccr}	10kA$_{rms}$
Residual current (N-PE)	I_{PE}	<5µA
Nominal voltage	U_n	230 V (50/60 Hz)
Rated voltage	U_c	264 V (50/60 Hz)
	U_{oc}	L(N)/PE, L/N = 6kV
Voltage protection level	U_p	L/N ≤ 1.4kV, L(N)/PE≤ 1.4kV
Humidity		5%…95%
9°C		-40/+80°C
Ports		1
IP code		IP20 (built in)
L x W x H		101mm x 17.7mm x 74.5mm
	I_L	26A (30°)

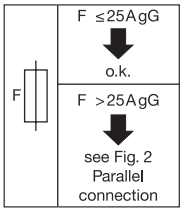
Indoor use only - there is no distance from the SPD to any earthed conductive surface required



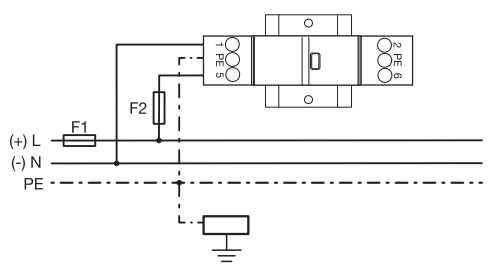
Serial Connection



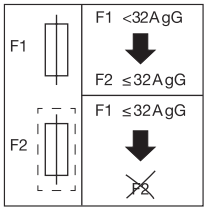
Backup Fuse



Parallel Connection



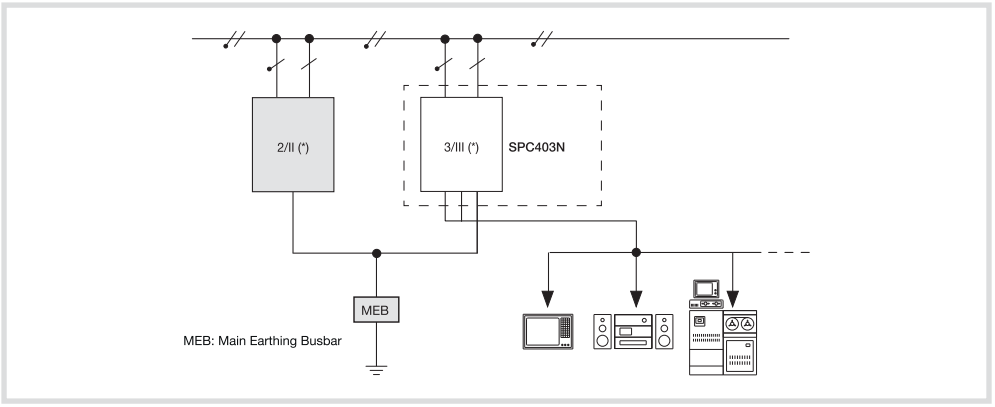
Backup Fuse



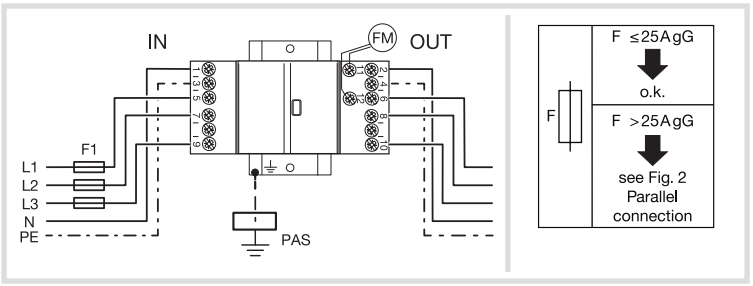
Characteristics

Tested to		EN 61643-11, IEC 61643-11
System		TT, TN
F1 max		25A (gG/B/C)
Nominal discharge current (8/20 µs)	I_n	L1-L2-L3(N)/PE, L1-L2-L3/N = 3kA
Short circuit current rating	I_{sccr}	15kA$_{rms}$
Residual current (N-PE)	I_{PE}	<5µA
Nominal voltage	U_n	230 V/400 V (50/60 Hz)
Rated voltage	U_c	264 V (50/60 Hz)
	U_{oc}	L1-L2-L3(N)/PE, L1-L2-L3/N = 6kV
Voltage protection level	U_p	L1-L2-L3/N ≤ 1.4kV, L1-L2-L3/N/PE≤ 1.5kV
Humidity		5%…95%
9°C		-40/+70°C
Ports		1
IP code		IP20 (built in)
L x W x H		90mm x 36mm x 73mm
	I_L	26A (30°)

Indoor use only - there is no distance from the SPD to any earthed conductive surface required

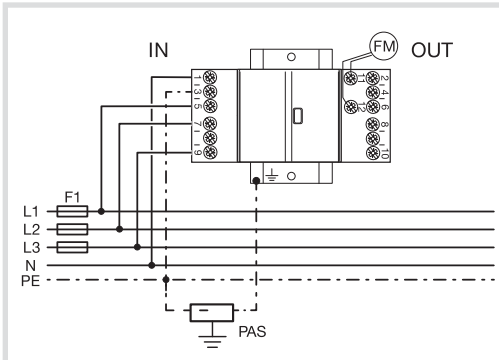


Serial Connection

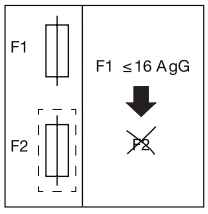


Backup Fuse

Parallel Connection



Backup Fuse

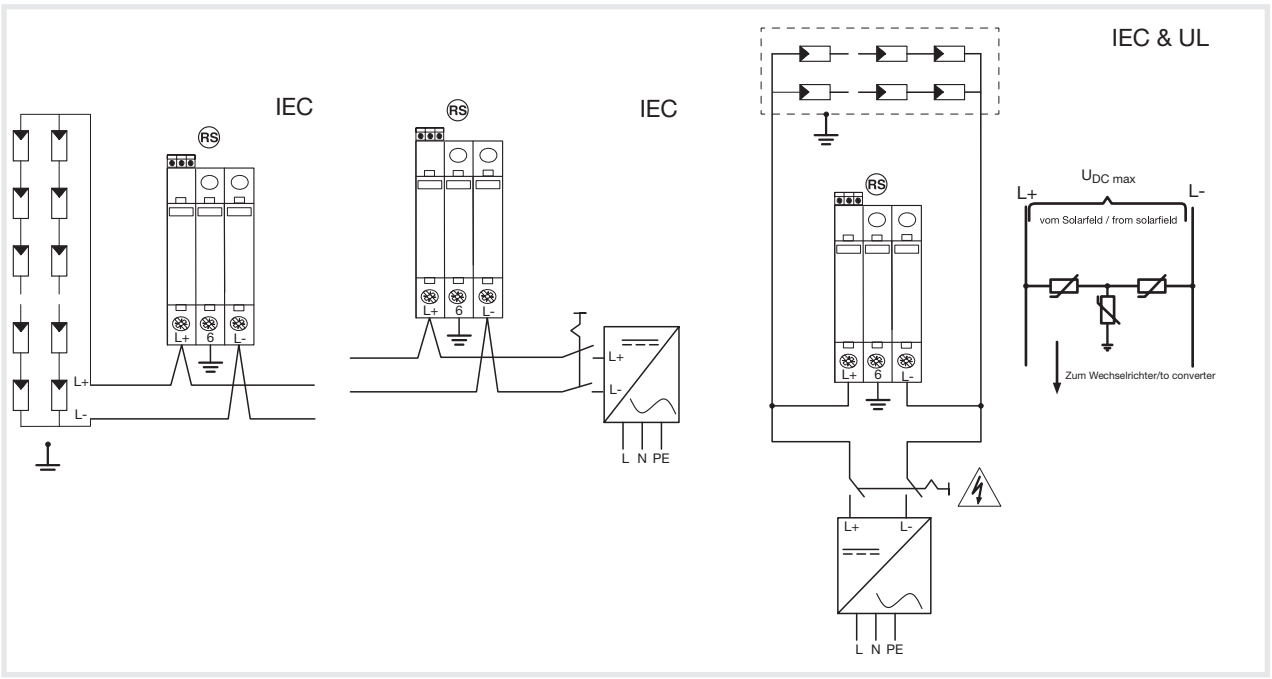


The integrated overcurrent protection is selective to upstream fuses F1 >16 AgG

Characteristics

Tested to		EN 50539-11
Voltage protection level	U_p	≤ 3.7kV
Rated voltage	U_{cpv}	≤ 1170 V DC
Nominal Discharge Current (8/20 µs)	I_n	15kA
Short Circuit Current Rating	I_{scpv}	2000A
	I_L	80A
	I_{max}	40kA (8/20µs)
Residual Current AC	$I_{pe,AC}$	≤ 250µA
Residual Current DC	$I_{pe,DC}$	≤ 20µA
Humidity		5%…95%
9°C		-40/+80°C
Ports		1
IP code		IP20 (built in)
L x W x H		98.7mm x 52.4mm x 65.7mm

Indoor use only



Residential Distribution

Basic Principles
The proper selection of the correct circuit protective device requires an understanding of the potential hazards against which protection for safety is required. The Wiring Regulations identify several hazards:
- electric shock
- thermal effects
- overcurrent
- underVoltage
- isolation

Electric shock
Electric shock is divided into two parts:
- direct contact: contact with parts which result in an electric shock in normal service
- indirect contact: contact with exposed conductive parts which result in an electric shock in case of a fault.

To protect against direct contact the Wiring Regulations suggest the following basic measures should be taken:
(1) by insulation of live parts
(2) by enclosures or barriers
(3) by obstacles
(4) by placing out of reach

To protect against indirect contact the Wiring Regulations suggest the following basic measures should be taken:
(1) earthed equipotential bonding and automatic disconnection of supply
(2) use of class II equipment or equivalent insulation
(3) non-conducting location
(4) earth-free local equipotential bonding
(5) electrical separation

Of these five measures, the first is by far the most commonly used:
(1) earthed equipotential bonding and automatic disconnection of supply:

In each installation main equipotential bonding conductors shall connect the main earthing terminal of the installation; this metalwork comprises exposed conductive parts which are part of the electrical installation itself and extraneous conductive parts including the following:
- main water pipes
- gas installation pipes
- other service pipes and ducting
- risers of central heating and air conditioning systems
- exposed metal parts of the building structure

This bonding creates a zone within which any Voltages appearing between exposed conductive parts and extraneous conductive parts, are minimised; the earth fault loop impedance must have an value low enough to allow sufficient current to flow for the circuit protective device to operate rapidly to disconnect the supply; disconnection must be sufficiently fast so that Voltages appearing on the bonded metalwork cannot persist long enough to cause danger; depending on the operating characteristics of the protective device and the earth impedance, such disconnection may be achieved either by overcurrent devices, Fuses, Miniature Circuit Breakers, (i.e. MCBs) or by Residual Current Devices, (i.e. RCCBs).

Thermal Effect
Refers to heat generated by the electrical equipment in normal use and under fault conditions. The proper selection of equipment complying with the latest product standards is essential in providing protection against thermal effects.

Overcurrent
Defined as a current exceeding the rated value of the circuit components. It may be caused by the overloading of a healthy circuit or it may take the form of a short-circuit current, defined as an "overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions". Overcurrent protection may be provided by using fuses or circuit breakers singly or in combination.

UnderVoltage
Refers to the dangers that could be caused by the reduction or loss in Voltage and the subsequent restoration, such as the unexpected re-starting of motors or the automatic closing of protective devices. The proper selection of control and protective devices must take the protection against underVoltage into consideration.

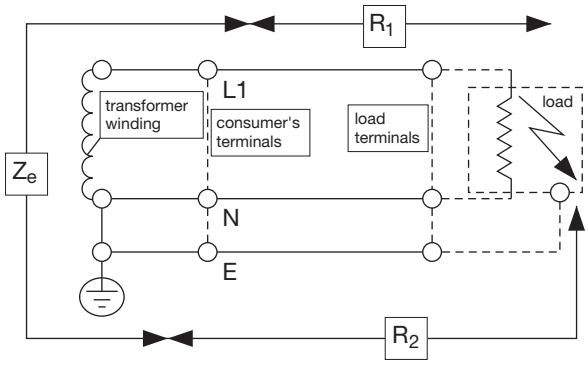
Isolation
Every circuit shall be provided with means of isolation (except in certain cases) to prevent or remove hazards associated with the installation, equipment and machines. The new standards for circuit breakers and switch-fuses now take this into account.

Protection against shock by indirect contact
Indirect contact - is the contact of persons or livestock with exposed conductive parts made live by a fault and which may result in electric shock. An example would be where the insulation of an electric heater has broken down resulting in a live conductor internally touching the casing. This could result in the heater casing being raised to a hazardous Voltage level, causing electric shock to a person touching it.

Two important measures must be taken to prevent this hazard:
- the impedance of circuit conductors is kept to a minimum. The eartfault loop impedance (Z_s) is used as a measure of the circuit impedance under fault conditions.
- the overcurrent device protecting the circuit is selected to rapidly disconnect an earth fault.

The effect of these two measures is inter-related.
1. By ensuring that the circuit protective conductor is of a low impedance, the Voltage to which the live casing is raised, under fault conditions, is kept to a minimum.
2. The low impedance path provided by the circuit conductors and the circuit protective conductor will result in a high level of current in the event of an earth fault. This high fault current ensures that the overcurrent protective device will disconnect the fault in a short time, reducing the interval during which the casing of the faulty equipment is live.

Components of earth fault loop impedance (Z_s) in a system.



(Earth fault at load between conductor and casing).
$\mathbf{Z_s = Z_e + (R_1 + R_2)}$

Earth fault loop impedance (Z_s)
To ensure the impedance of conductors in a circuit is sufficiently low the system designer has to establish the value of the earth fault loop impedance.
$\mathbf{Z_s}$ - is a measure of the earth fault current loop, comprising the phase conductor and the earth conductor. It comprises the complete loop including the winding of the transformer from which the circuit is supplied as defined by the following:
$\mathbf{Z_e}$ - is the part of the earth fault loop impedance external to the installation, its value can be measured or a nominal value can be obtained from the supply authority.

(R_1 +R_2) - where R_1 is the resistance of the phase conductor within the installation and R_2 is the resistance of the circuit protective conductor. These two components constitute the loop impedance within the installation.

Therefore: $Z_s = Z_e + (R_1 + R_2)$

Once the value of Z_s has been established a suitable overcurrent protective device has to be selected to ensure disconnection of an earth fault within the specified time.The times are:
- 5 seconds for fixed equipment.
- For portable equipment and for fixed equipment installed outside the equipotential bonding zone, the disconnection times are dependent on the nominal Voltage to earth, i.e. 220 to 277 volts = 0.4 seconds.

Z_s by calculation
To establish whether the relevant disconnection time can be achieved a simple calculation must be made, based on Ohm's law:

$$I_f \text{ (fault current)} = \frac{\text{Uo (open circuit Voltage)*}}{Z_s \text{ (earth fault loop)}}$$

* Voltage between phase and earth (240V)

The fault current (I_f) must be high enough to cause the circuit protective device to trip in the specified time. This can be established by consulting the time/current characteristic for the protective device. If the maximum trip time for the fault current calculated is less than or equal to the relevant value (5s for fixed equipment; 0.4s for portable equipment) then compliance is achieved. It is important that when consulting the characteristic curve the worst case is used, i.e. the maximum tripping time including any tolerance. An example is shown in Figs 1 and 2.

Z_s by tables
The above procedure can be used for any type of protective device providing a time/current characteristic curve is available. Frequently, however, a much simpler method is available using tables listing maximum Z_s values which have been interpreted from the characteristic curves for the relevant devices. Providing the system Z_s is equal to or less than the value given in the table, compliance is achieved. Tables for a number of 'standard' devices (certain fuses and MCBs) are given in the Wiring Regulations.

Zs too high
If the system Z_s value is too high to achieve rapid enough disconnection with the overcurrent protective devices available then it is necessary to use one of the two following methods:
- fit a cable with a larger cross-section and consequently a lower impedance. This may be a very expensive solution especially when the installation is complete before the problem is discovered.
- use a Hager residual current device (RCD). Subject to certain conditions being met this provides a simple and economical solution.

Example

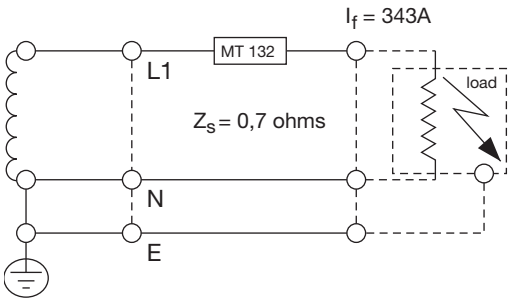
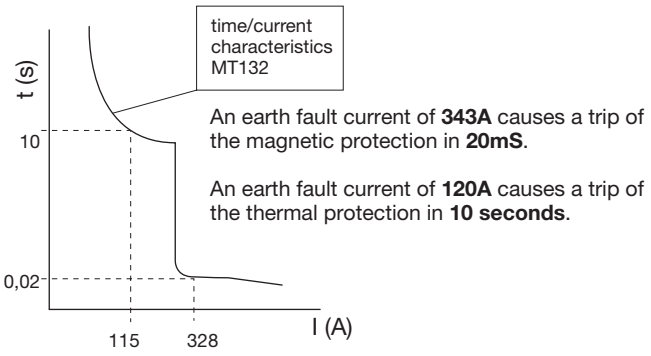


Diagram above shows a fixed circuit with an earth loop impedance Z_s of 0.7 ohms protected with an MT 132. The fault current (I_f) will therefore be U_o/Z_s = 240/0.7 = 343A
By referring to the characteristic for MT132 (see diagram below) it can be seen that the breaker will disconnect in 0.02 seconds for this current. The breaker therefore easily satisfies the requirement for disconnection in 5 seconds.

If the circuit Z_s was 2.0 ohms then the fault current would be: 240/2 = 120A and the disconnection time would be 10 seconds, in which case compliance would not be achieved.



Protection against overcurrent
Overcurrent - "A current exceeding the rated value. For conductors the rated value is the current-carrying capacity"

Overload Current
"An overcurrent occurring in a circuit which is electrically sound"

Short-Circuit Current
"An overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions."

Protection against Overload Current
For the protection against overload current, protective devices must be provided in the circuit to break any overload current flowing in the circuit conductors before it can cause a temperature rise which would be detrimental to insulation, joints, terminations or the surroundings of the conductors.

In order to achieve this protection the nominal current of the protective device I_n should be not less than the design current of the circuit I_b and that I_n should not exceed the current-carrying capacity of the conductors I_z, and that the current causing effective operation of the protective device I2 does not exceed 1.45 times the current-carrying capacity of the conductor I_z, expressed as
$I_b \leq I_n \leq I_z$
$I_2 \leq 1.45 I_z$

Protection against Short-Circuit Current
Protective devices must be provided to break any short-circuit current before it can cause danger due to thermal and mechanical (electro-dynamic) effects produced in the conductors and connections. The breaking capacity of the protective device shall not be less than the prospective short-circuit current at the point at which the device is installed. However a lower breaking capacity is permitted provided that a properly co-ordinated back-up device having the necessary breaking capacity is installed on the supply side.

Positioning of Overcurrent Devices
Devices for the protection against overload and short-circuit must be placed at the point where a reduction occurs in the current-carrying capacity of the conductors. This reduction could be caused by a change in the environmental conditions as well as the more obvious change in the cross-sectional area of the cable.

There are of course exceptions to this general rule which relate to a very few special applications. These are set out in detail in the the Wiring Regulations.

Both of the new International Standards covering Low Voltage Circuit Breakers provide the user with a better assurance of quality and performance by taking into account the actual operating conditions of the breaker. New definitions and symbols have been introduced which should be committed to memory. Some of those most frequently used are:

Ue : rated service Voltage
Ui : rated insulation Voltage (> Uemax)
Uimp : rated impulse withstand
Icm : rated short circuit making capacity
Icn : rated short circuit capacity
Ics : rated service short circuit breaking capacity
Icu : rated ultimate short circuit breaking capacity
IΔn : rated residual operating current (often called residual sensitivity)
In: rated current = maximum value of current used for the temperature rise test
Δt: trip delay of residual current devices

In addition IEC 898 sets out to provide a greater degree of safety to the uninstructed users of circuit breakers. It is interesting to note that the description “miniature circuit breaker” or MCB is not used at all in this standard, but no doubt both manufacturers and users will continue to call circuit breakers complying with IEC 898 miniature circuit breakers or MCBs for some time to come.

The scope of this standard is limited to ac air break circuit breakers for operation at 50Hz or 60Hz, having a rated current not exceeding 125A and a rated short-circuit capacity not exceeding 25kA.

A rated service short-circuit breaking capacity Ics is also included which is equal to the rated short-circuit capacity Icn for short-circuit capacity values up to and including 6kA, and 50% of Icn above 6kA with a minimum value of 7.5kA. As the circuit- breakers covered by this standard are intended for household and similar uses, Ics is of academic interest only. The rated short-circuit capacity of a MCB (Icn) is the alternating component of the prospective current expressed by its r.m.s. value, which the MCB is designed to make, carry for its opening time and to break under specified conditions. Icn is shown on the MCB label in a rectangular box without the suffix ‘A’ and is the value which is used for application purposes. Icn (of the MCB) should be equal to or greater than the prospective short-circuit current at the point of application.

You will see from the curves that the inverse time delay characteristic which provides overload protection is the same on all three. This is because the Standards requires the breaker to carry 1.13 times the rated current without tripping for at least one hour and when the test current is increased to 1.45 times the rated current, it must trip within one hour, and again from cold if the last current is increased to 2.55 times the rated current the breaker must trip between 1 and 120 seconds. The inverse time delay characteristic of all MCBs claiming compliance with IEC 898 must operate within these limits.

The difference between the three types of characteristic curves designated ‘B’, ‘C’ and ‘D’ concerns only the magnetic instantaneous trip which provides short-circuit protection.

- For type ‘B’ the breaker must trip between the limits of 3 to 5 times rated current
- For type ‘C” the breaker must trip between the limits of 5 to 10 times rated current, and
- For type ‘D’ the breaker must trip between the limits of 10 to 20 times rated current.

Often manufacturers publish their MCB tripping characteristics showing the limits set by the standard and guarantee that any breaker that you purchase will operate within these limits. So great care should be taken when working with characteristic curves showing lower and higher limits - on no account should you take a mean point for application design purposes.

For cable protection applications you should take the maximum tripping time and some manufacturers publish single line characteristic curves which show the maximum tripping time. If the design problem is nuisance tripping then the minimum tripping time should be used and for desk top co-ordination studies, both lower and upper limits have to be taken into account.

Energy limiting
Energy is measured in Joules. *James Prescott Joule proved that thermal energy was produced when an electric current flowed through a resistance for a certain time, giving us the formula :

Joules = I2 x R x t or because we know that watts = I2R
Joules = watts x seconds
Therefore we can say that :
One Joule = one watt second
or energy = watts x seconds = I2 R t

If the resistance (R) remains constant or is very small compared with the current (I) as in the case of short-circuit current, then energy becomes proportional to I2t. Which is why the energy let-through of a protective device is expressed in ampere squared seconds and referred to as I2t

I2t (Joule Integral) is the integral of the square of the current over a given time interval (t0, t1)

The I2t characteristic of a circuit breaker is shown as a curve giving the maximum values of I2t as a function of the prospective current.

Manufacturers are required by the Standard to produce the I2t characteristic of their circuit breakers.

The energy limiting characteristics of modern MCBs greatly reduce the damage that might otherwise be caused by short-circuits. They protect the cable insulation and reduce the risk of fire and other damage. Knowledge of the energy limiting characteristic of a circuit breaker also helps the circuit designer calculate discrimination with other protective devices in the same circuit.

Because of the importance of the energy limiting characteristic the Standards for circuit breakers for household and similar installations suggests three energy limiting classes based on the permissible I2t (let-through) values for circuit breakers up to 32A; class 3 having the highest energy limiting performance.

All Hager MCBs are well within the limits of energy let-through set by IEC 898 for energy limiting class 3.

Breaking capacity according to IEC/EN 60 898 and IEC/EN 60 947-2

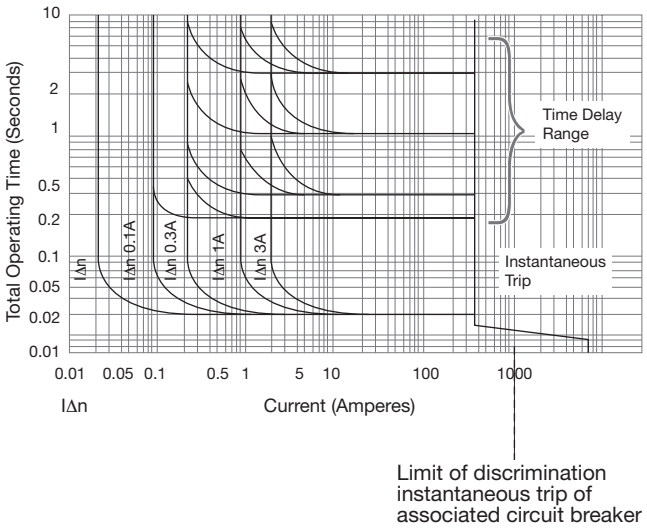
References	**MJN MHN**	**MLN**	**Ax8xxx**	**Ax9xxx**
poles	Ph+N	Ph+N	Ph+N	Ph+N
nominal current In (A)	2 to 40	2 to 40	6 to 40	6 to 40
breaking capacity to IEC/EN 60 898				
230V	4500A	6000A	4500A	6000A
400V	-	-	-	-
breaking capacity to IEC/EN 60 947-2				
230V	6kA	7,5kA	6kA	10kA
400V	-	-	-	-

References	**MV MW**		**MT MU**		**MBN MCN**		**MB MC**		**NGN**				
poles	1	2, 3, 4	1	2, 3, 4	1	2, 3, 4	1	2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1	2, 3, 4
nominal current In (A)	6 to 40	6 to 40	6 to 40	6 to 40	6 to 63	6 to 63	0,5 to 63	0,5 to 63	0,5 to 2	3 to 6	6	10 to 63	10 to 63
breaking capacity to IEC/EN 60 898													
230V	3000A	4500A	6000A	10000A	6000A	10000A	6000A	10000A	-	-	-	6000A	10000A
400V	-	3000A	-	6000A	-	6000A	-	6000A	-	-	-	6000A	6000A
breaking capacity to IEC/EN 60 947-2													
230V	4,5kA	6kA	-	-	6kA	10kA	10kA	20kA	80kA	50kA	30kA	10kA	20kA
400V	3kA	4,5kA	-	-	3kA	3kA	3kA	10kA	80kA	50kA	30kA	3kA	10kA

References	**NBN, NCN NDN**					**NQN, NRN, NSN**					
poles	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1	2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
nominal current In (A)	0,5 to 2	3 to 6	6	10 to 63	10 to 63	0,5 to 2	3 to 6	6	6 to 25	32 to 40	50 to 63
breaking capacity to IEC/EN 60 898											
230V	-	-	-	10000A	-	-	-	-	-	-	-
400V	-	-	-	-	10000A	-	-	-	-	-	-
breaking capacity to IEC/EN 60 947-2											
230V	80kA	50kA	30kA	15kA	20kA	80kA	50kA	30kA	25kA	20kA	15kA
400V	80kA	50kA	30v	3kA	15kA	80kA	50kA	30kA	25kA	20kA	15kA

References	**HLE HLF**		**HMB, HMC HMD**		**HMJ HMK**		**HMX**	
poles	1	2, 3, 4	1	2, 3, 4	1	2, 3, 4	1	2, 3, 4
nominal current In (A)	80 to 125	80 to 125	80 to 125	80 to 125	80 to 125	80 to 125	10 to 63	10 to 63
breaking capacity to IEC/EN 60 898								
230V	15kA	10kA		15kA		-		-
400V	10kA	10kA		15kA		-		-
breaking capacity to IEC/EN 60 947-2								
230V	15kA	15kA		30kA		60kA		100kA
400V	10kA	10kA		15kA		30kA		50kA

Typical RCCB Time/Current Characteristics



Having decided on the type and the limit of discrimination of the circuit breakers in the system, it is very important to consider the discrimination between any add on RCCBs. In theory it is possible to achieve current discrimination between RCCBs but the limit of discrimination is too low for practical purposes. Time discrimination is by far the best method and is achieved by delaying the tripping of the upstream RCCB.

Note that the limit of discrimination is the instantaneous setting of the associated circuit breaker. In other words if the earth fault current is greater than the instantaneous trip setting of the associated circuit breaker, the circuit breaker will trip regardless of the time delay on the RCCB. The table below indicates how time discrimination may be achieved between RCCBs.

		Up-stream RCCB sensitivity IΔn																
		0,01A	0,03A	0,1A		0,3A					1,0A				3,0A			
Downstream RCCB sensitivity IΔn	Time delay (sec.)	0	0	0	0,2	0	0,2	0,3	1,0	3,0	0	0,3	1,0	3,0	0	0,3	1,0	3,0
0,01A	0				■		■	■	■	■		■	■	■		■	■	■
0,03A	0				■		■	■	■	■		■	■	■		■	■	■
0,1A	0				■		■	■	■	■		■	■	■		■	■	■
	0,2							■	■	■		■	■	■		■	■	■
0,3A	0						■	■	■	■		■	■	■		■	■	■
	0,2							■	■	■		■	■	■		■	■	■
	0,3								■	■			■	■			■	■
	1,0									■				■				■
	3,0																	
1,0A	0											■	■	■		■	■	■
	0,3												■	■			■	■
	2,0													■				■
	3,0																	
3,0A	0															■	■	■
	0,3																■	■
	1,0																	■
	3,0																	

■ Discrimination achieved

DC Applications

Because of their quick make and break design and excellent arc quenching capabilities, Hager circuit breakers are suitable for use on DC. When selecting a circuit breaker for any DC application it is necessary to consider 2 main points:

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

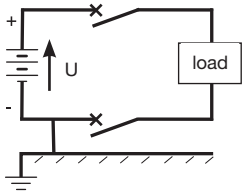
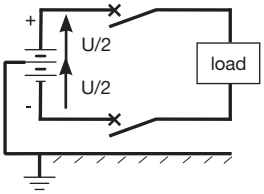
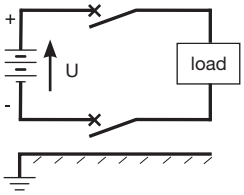
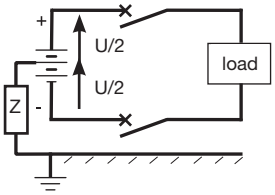
b) type of DC systems: 3 different types
- Network connected to the earth - one polarity earthed (+ve or -ve):
  If -ve is earthed, all poles will be placed in series in the +ve leg. If the +ve is earthed, all poles will be placed in the -ve leg.
  Note: an extra pole will be needed on the earthed polarity to provide isolation.
- Network connected to the earth - middle point earthed:
  The number of poles required to break Isc should be placed on each polarity.
- Network insulated to the earth:
  The number of poles required to break Isc should be split between the two polarities.

Information
To disconnect under load, use a DC switch SB432PV (32A - 1000V DC).

Table 2 magnetic trip		□	□	□	√
		I_{t1}	I_{t2}	I_{rm1}	I_{rm2}
curve B	AC M 50Hz	1,13 In	1,45 In	3 In	5 In
	DC ⎓	1,13 In	1,45 In	4 In	7 In
curve C	AC M 50Hz	1,13 In	1,45 In	5 In	10 In
	DC ⎓	1,13 In	1,45 In	7 In	15 In
curve D	AC M 50Hz	1,13 In	1,45 In	10 In	20 In
	DC ⎓	1,13 In	1,45 In	15 In	30 In

Table 1			breaking capacity (kA) L/R = 15ms				
range	In	nb of poles in series needed for breaking	≤48V	60V	125V	250V	500V
MT, MU, MB, MC, MV, MW, MBNxxxW, MCNxxxA	0,5 to 63A	1P	15	-	-	-	-
		2P	20	20	-	-	-
		3P	25	25	20	-	-
		4P	35	35	25	-	-
NGN, NB-NxxxA, NCNxxxA, NDNxxxA	0,5 to 63A	1P	15	15	10	-	-
		2P	20	20	15	6	-
		3P	25	25	20	10	-
		4P	35	35	25	15	10
NRN NSN, NQN	0,5 to 20A	1P	25	25	20	-	-
		2P	35	35	25	15	-
		3P	40	40	35	20	-
		4P	45	45	40	25	10
	25 to 40A	1P	20	20	15	-	-
		2P	25	25	20	10	-
		3P	30	30	30	15	-
		4P	35	35	35	20	10
	50 and 63A	1P	15	15	10	-	-
		2P	20	20	15	6	-
		3P	25	25	20	10	-
		4P	35	35	25	15	10
HMB, HMC, HMD, HMK, HMJ	80 to 125A	1P	15	15	10	-	-
		2P	20	20	15	6	-
		3P	30	30	30	15	-
		4P	35	35	35	20	10
HMX	10 to 63A	1P	25	25	20	-	-
		2P	35	35	25	15	-
		3P	40	40	35	20	-
		4P	45	45	40	25	10
HLFxxxS HLExxxS	80 to 125A	1P	12	12	8	-	-
		2P	15	15	10	4	-
		3P	25	25	25	10	-
		4P	30	30	30	15	5

c) earthing system types

earthing diagrams TT, TNS, TNC		IT system isolated to the earth	
a polarity connected to earth	earthed center point		
			
- Network connected to the earth - one polarity earthed (+ve or -ve): If -ve is earthed, all poles will be placed in series in the +ve leg. If the +ve is earthed, all poles will be placed in the -ve leg.	- Network connected to the earth - middle point earthed: The number of poles required to break Isc should be placed on each polarity.	- Network insulated to the earth: The number of poles required to break Isc should be split between the two polarities.	- Network connected to the earth - middle point earthed: The number of poles required to break Isc should be placed on each polarity.

Residential Distribution

Electrical Characteristics Switch Disconnectors												
Family		**SBx / SFx**			**SBx**			**SBx**				
Number of pole		1P - 2P - 3P - 4P										
Frame size		frame size 1			frame size 2			frame size 3				
Comply to standard	IEC 60947-3	ok			ok			ok				
	IEC 60669-2-4	ok			ok			-				
Thermal current Ith (40°C)		16A	25A	32A	32A	40A	63A	63A	80A	100A	125A	
Operational frequency		50/60 Hz			50/60 Hz			50/60 Hz				
Rated insulation voltage (Ui)		440V			440V			440V				
Rated impulse withstand voltage Uimp		3kV			6 kV			6 kV				
Protection degree		3 (SB) / 2 (SF)			3			3				
Working temperature		-20 to 50°C										
Storage temperature		-40 to 80°C										
Operational Currents I_e												
Rated voltage	load duty category											
400V AC	AC 21-A[1]		16A	25A	32A	32A	40A	63A	63A	80A	100A	125A
	AC 22-A[1]		16A	25A	32A	32A	40A	63A	63A	80A	100A	125A
	AC 23-A[1]		10A	10A	10A	32A	40A	40A	40A	40A	40A	40A
Short circuit characteristics												
Rated short time withstand current 1s Icw (rms)	IEC 60947-3	240A	375A	480A	480A	600A	945A	945A	960A	1200A	1500A	
Prospective short circuit current (rms)	EN 60669-2-4	3kA			6kA			n/a				
Mechanical characteristics												
Rigid cable section		16 mm^2			25 mm^2			50 mm^2				
Flexible cable section		10 mm^2			16 mm^2			35 mm^2				
Tightening torque		1.8 Nm			2.8 Nm			3.6 Nm				
Busbar thickness		n/a			1 to 1.5 mm			1.5 to 2 mm				
IP protection degree		20										
Mechanical endurance (number of cycles)		100000			30000			20000				
Electrical endurance @ AC22 (number of cycles)		25000			5000			2500				

[1] A category: frequent operation