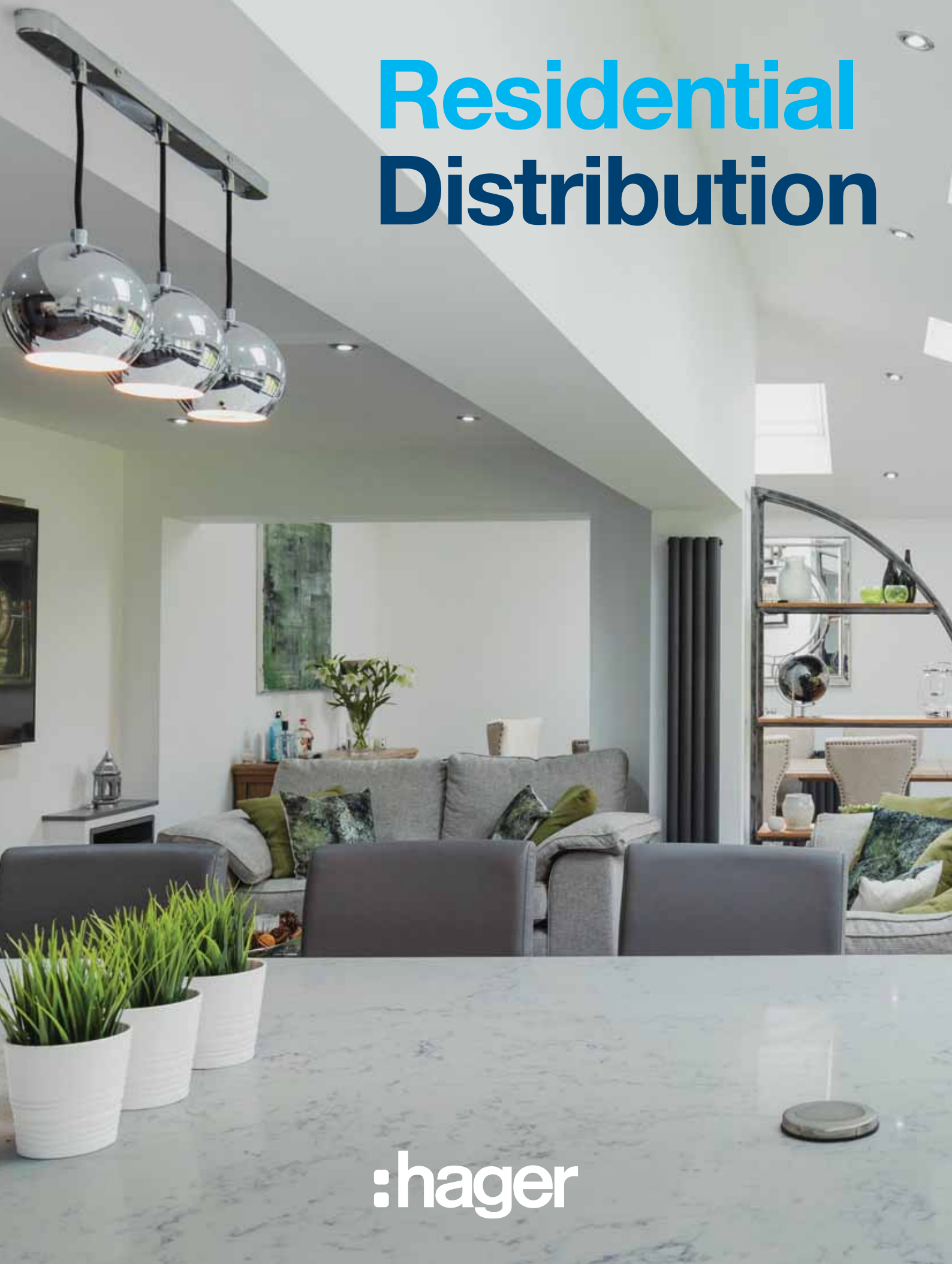


Residential Distribution



:hager

Consumer Units

Surface Mounted Consumer Units	3
--------------------------------	---

Flush Mounted Consumer Units	9
------------------------------	---

Enclosures

Surface Mounted Enclosures	11
----------------------------	----

Flush Mounted Enclosures	26
--------------------------	----

Protection Devices

RCCBs	29
-------	----

MCBs	29
------	----

RCBOs	29
-------	----

Locking Kit	31
-------------	----

Arc Fault Detection Devices	31
-----------------------------	----

Surge Protection	32
------------------	----

Switching

Switch Disconnectors	33
----------------------	----

Auxiliaries & Accessories	36
---------------------------	----

Changeover Switches	37
---------------------	----

Technical Pages	38
-----------------	----



SBE8101

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 modules	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	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

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.



SBE700



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

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



MCU63

Shower Changeover Units

Description	Qty.	Cat ref.
Priority 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



SHN1



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

Consumer units with opaque or transparent doors, 1 - 4 rows, 18 - 72 modules.

Insulated 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 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.

Insulated 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 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

Consumer units with transparent doors, 2 - 3 rows, 36 - 54 modules.

Insulated 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



VBE880A

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



VZ318P

Refer to page 12 for additional terminals



VF8101

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

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.



VF700

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

Characteristics:

- Blanking strip to blank unused rows.



S35S

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

Connection Assembly

Characteristics:

- Connection assembly single phase and TP + N63A



VZ403

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

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



KB163P



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 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

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



GP213P-GP213T



S35S

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 mm ²	6 mod	GD118A
2 rows, 36 mod	w.355 x h.375 x d.103	Ph: 2 x 16 + 2 x 10 mm ² N: 2 x 16 + 2 x 10 mm ² E: 6 x 25 + 20 x 4 mm ²	12 mod	GD218A
3 rows, 54 mod	w.355 x h.500 x d.103	Ph: 3 x 16 + 4 x 10 mm ² N: 3 x 16 + 4 x 10 mm ² E: 8 x 25 + 28 x 4 mm ²	18 mod	GD318A
4 rows, 72 mod	w.355 x h.625 x d.103	Ph: 3 x 16 + 4 x 10 mm ² N: 3 x 16 + 4 x 10 mm ² E: 10 x 25 + 34 x 4 mm ²	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

Description	Terminal block with support		Terminal block w/o support
	Neutral Cat. ref.	Earth Cat. ref.	Cat. ref.
Terminal block 3 x 16 + 4 x 10 mm ²	KM07N	KM07E	K142
Terminal block 5 x 16 + 6 x 10 mm ²	KM11N	KM11E	K144
Terminal block 6 x 16 + 7 x 10 mm ²	KM13N	KM13E	K148
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm ²	KM17N	KM17E	K156
Terminal block 1 x 25 + 11 x 16 + 3 x 10 mm ²	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 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

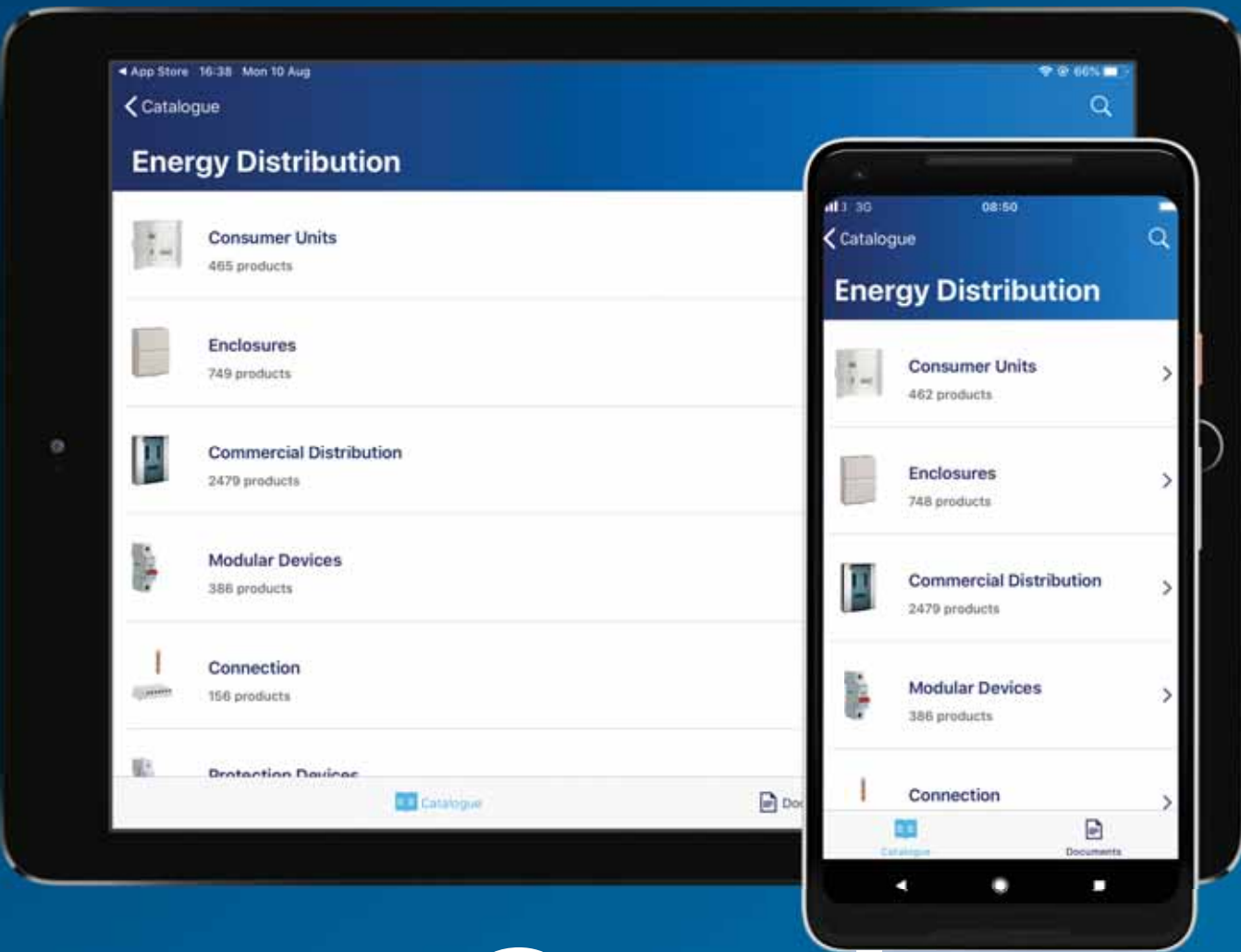


GZ04N

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



e-Catalogue

app by Hager

Our e-Catalogue app is always up-to-date with our full product range. Check out product info, technical data & dimensions for all of our products, with no internet connection required.



Search

All products can be searched for by part reference or description, making it easier than ever to find the product you're after.



No connection needed

Everything is stored within the app, so you can access all of the product information you need, when you need it.

Search 'Hager e-catalogue' in the Apple App Store or Google Play, on phones and tablets.



:hager



VB318W



VB318J

Vega Enclosures

Enclosures with opaque or transparent doors, 1 - 4 rows, 18 - 72 modules.

Insulated 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 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 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 : U_i 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 40.



VE212R



VE106R



VE312R



VE218R

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

Accessories

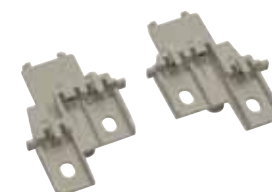
Description	Cat. ref.
Single phase connection assembly 63A, snaps on lateral support	2x(3x16 + 4x10mm ²) VZ403
Three phase + N connection assembly 63A, snaps on lateral support	3x(3x16 + 2x10mm ²), 1x(5x16 + 6x10mm ²) VZ428
Lock with 2 keys for all enclosures from 2 to 54 modules	VZ311
Coupling sleeve 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



VZ403



VZ754



VZ744

Refer to page 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 dismantling the cover.
- Optional lock with keys.
- Door opens up to 180°
- 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: 650°C
- Certification according to IEC 61 439-3.
- All products conform to the ROHS and WEEE directives.
- For technical details see page 41.

Description		Dimensions mm	Cat ref.
Golf surface mounted enclosure 1 row 4 modules	N: 2x16mm ² + 2x10mm ² E: 2x16mm ² + 2x10mm ² N: 2x16mm ² + 2x10mm ²	h.184 x w.138 x d.99	VS104TDI
Golf surface mounted enclosure 1 row 8 modules	N: 3x16mm ² + 4x10mm ² E: 2x16mm ² + 3x10mm ² N: 2x16mm ² + 3x10mm ²	h.184 x w.210 x d.99	VS108TDI
Golf surface mounted enclosure 1 row 12 modules	N: 3x16mm ² + 4x10mm ² E: 3x16mm ² + 4x10mm ² N: 3x16mm ² + 4x10mm ²	h.252 x w.282 x d.99	VS112TDI
Golf surface mounted enclosure 1 row 18 modules	N: 3x16mm ² + 4x10 mm ² E: 1x25mm ² + 4x16mm ² + 5x10mm ² N: 3x16mm ² + 3x10mm ²	h.257 x w.426 x d.72	VS118TDI
Golf surface mounted enclosure 1 rows 22 modules	N: 3x16mm ² + 4x10mm ² E: 6x16mm ² + 7x10mm ² N: 6x16mm ² + 7x10mm ²	h.252 x w.462 x d.99	VS122TDI
Golf surface mounted enclosure 2 rows 24 modules	N: 5x16mm ² + 5x10mm ² E: 4x16mm ² + 5x10mm ² N: 4x16mm ² + 5x10mm ²	h.377 x w.282 x d.99	VS212TDI
Golf surface mounted enclosure 2 rows 36 modules	N: 3 x 16mm ² + 4 x 10mm ² E: 1x25mm ² + 6x16mm ² + 7x10mm ² N: 3 x 16mm ² + 4 x 10mm ²	h.377 x w.390 x d.99	VS218TDI
Golf surface mounted enclosure 3 rows 36 modules	N: 5x16mm ² + 6x10mm ² E: 5x16mm ² + 6x10mm ² N: 5x16mm ² + 6x10mm ²	h.500 x w.282 x d.99	VS312TDI
Golf surface mounted enclosure 3 rows 54 modules	N: 3x16mm ² + 4x10mm ² E: 1x25mm ² + 7x16mm ² + 8x10mm ² N: 3x16 mm ² + 4x10mm ²	h.500 x w.390 x d.99	VS318TDI
Golf surface mounted enclosure 4 row 48 modules	N: 5x16mm ² + 6x10mm ² E: 6x16mm ² + 8x10mm ² N: 5x16mm ² + 6x10mm ²	h.647 x w.282 x d.99	VS412TDI
Golf surface mounted enclosure 4 rows 72 modules	N: 3 x 16 mm ² + 4 x 10 mm ² E: 1x25mm ² + 8x16mm ² + 9x10mm ² N: 3x16mm ² + 4x10mm ²	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		Terminal block w/o support
	Neutral Cat. ref.	Earth Cat. ref.	Cat. ref.
Terminal block 3 x 16 + 4 x 10 mm ²	KM07N	KM07E	K142
Terminal block 5 x 16 + 6 x 10 mm ²	KM11N	KM11E	K144
Terminal block 6 x 16 + 7 x 10 mm ²	KM13N	KM13E	K148
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm ²	KM17N	KM17E	K156
Terminal block 1 x 25 + 11 x 16 + 3 x 10 mm ²	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 outgoing 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 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 + 16x10mm ² , 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



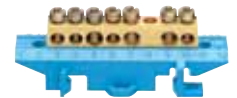
FZ597



FW424FD

Additional Terminals

Description	Terminal block with support		Terminal block w/o support	Cat. ref.
	Neutral Cat. ref.	Earth Cat. ref.		
Terminal block 3 x 16 + 4 x 10 mm ²	KM07N	KM07E		K142
Terminal block 5 x 16 + 6 x 10 mm ²	KM11N	KM11E		K144
Terminal block 6 x 16 + 7 x 10 mm ²	KM13N	KM13E		K148
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm ²	KM17N	KM17E		K156
Terminal block 1 x 25 + 11 x 16 + 3 x 10 mm ²	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 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

- U_i : 400 V ~
- I_n : 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					
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 mm ²						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



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
Slotted doors	FWB71	1	-	FZ021N
	FWB72	1	-	FZ022N
	FWB73	1	FZ023N	FZ022N
	FWB74	1	FZ024N	FZ022N
	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

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.



FZ401

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



FZ598N



FZ425



FZ428



UZ06A1

Volta Enclosures

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 45

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



VU24IE



VU36IE

Accessories

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	VZ131N
	2 rows	VZ132N
	3 rows	VZ133N
	4 rows	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



VZ131N



VZ808N



VZ293N

Refer to page 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: 2x16mm ² + 2x10mm ² , E: 2x16mm ² + 2x10mm ² , N: 2x16mm ² + 2x10mm ²	h.189 x w.170 x d.72	VF104TDI
Golf flush mounted enclosure, 1 row 8 mod. N: 3x16mm ² + 4x10mm ² E: 3x16mm ² + 3x10mm ² , N: 3x16mm ² + 3x10mm ²	h.189 x w.242 x d.72	VF108TDI
Golf flush mounted enclosure, 1 row 12 mod. N: 3x16mm ² + 5x10mm ² , E: 3x16mm ² + 4x10mm ² , N: 3x16mm ² + 4x10 mm ²	h.257 x w.318 x d.72	VF112TDI
Golf flush mounted enclosure, 1 row 22 mod. N: 3x16mm ² + 4x10mm ² E: 6x16mm ² + 7x10mm ² , N: 6x16mm ² + 7x10mm ²	h.257 x w.498 x d.72	VF122TDI
Golf flush mounted enclosure, 2 rows 24 mod. N: 5x16mm ² + 5x10mm ² , E: 4x16mm ² + 5x10mm ² , N: 4x16mm ² + 5x10mm ²	h.382 x w.318 x d.72	VF212TDI
Golf flush mounted enclosure, 3 rows 36 mod. N: 5x16mm ² + 6x10mm ² , E: 5x16 mm ² + 6x10 mm ² , N: 5x16mm ² + 6x10mm ²	h.507 x w.318 x d.72	VF312TDI
Golf flush mounted enclosure, 4 rows 48 mod. N: 5 x 16 mm ² + 6 x 10 mm ² , E: 6 x 16 mm ² + 7 x 10 mm ² , N: 6 x 16 mm ² + 7 x 10 mm ²	h.652 x w.318 x d.72	VF412TDI



KM07N



KM13N



KM25N

Additional Terminals

Description	Terminal block with support		Terminal block w/o support
	Neutral Cat. ref	Earth Cat. ref	Cat ref.
Terminal block 3 x 16 + 4 x 10 mm ²	KM07N	KM07E	K142
Terminal block 5 x 16 + 6 x 10 mm ²	KM11N	KM11E	K144
Terminal block 6 x 16 + 7 x 10 mm ²	KM13N	KM13E	K148
Terminal block 1 x 25 + 8 x 16 + 8 x 10 mm ²	KM17N	KM17E	K156
Terminal block 1 x 25 + 11 x 16 + 3 x 10 mm ²	KM25N	KM25E	K158

FW Enclosures

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 47.



FWU62S

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 mm ²	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 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

MCBs Type B & C 6kA Single Pole



MBN116W

- 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

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



ADA106U

- 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, IEC61009-2-2,
- 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

- 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.



ADA306G

Description	Breaking capacity (IEC 60 898-1)	Width (17.5mm)	Quantity	B Curve Cat ref.
6A	6kA	1 mod	1	ADA306G
10A	6kA	1 mod	1	ADA310G
16A	6kA	1 mod	1	ADA316G
20A	6kA	1 mod	1	ADA320G
25A	6kA	1 mod	1	ADA325G
32A	6kA	1 mod	1	ADA332G

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

- 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)**



AD916J

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

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



ADA506D



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



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=25mm², Flexible = 16mm²

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

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



SPA800



SPA801

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

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



SPB140R

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

Surge Protection Type 2, 2 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: 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



SPB208D

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 U_c 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, I _{max} 8kA	SPB008D
Cartridge T2 L-N U_c 275V U_p 1.35kV	SPB015
Cartridge L-N, In 5kA, I _{max} 15kA	SPB015D
Cartridge T2 N-PE U_c 260V U_p 1.5kV	SPB015N
Cartridge L-N, In 20kA, I _{max} 40kA	SPB040D
Cartridge N-PE, In 20kA, I _{max} 40kA	SPB040N
Cartridge N-PE, In 20kA, I _{max} 65kA	SPB065N
Cartridge L-N, In 20kA, I _{max} 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 $\leq 1.5\text{kV}$. 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.

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



SPC203N

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

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



SPC023N

Surge Protection for IP Broadband Connections

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



SPK603



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 shroud 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



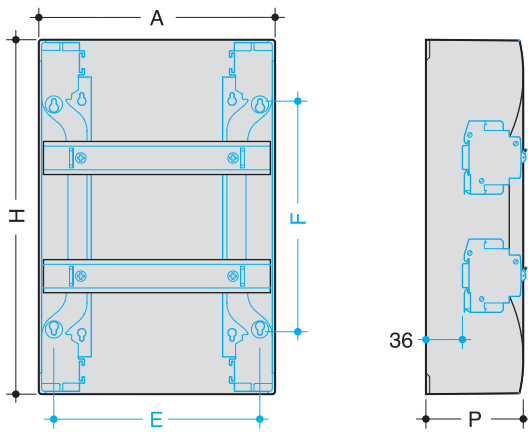
SFH125

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

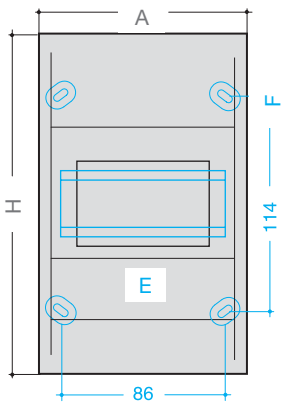


Dimensions

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.

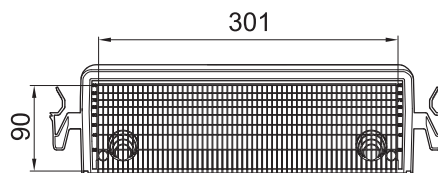
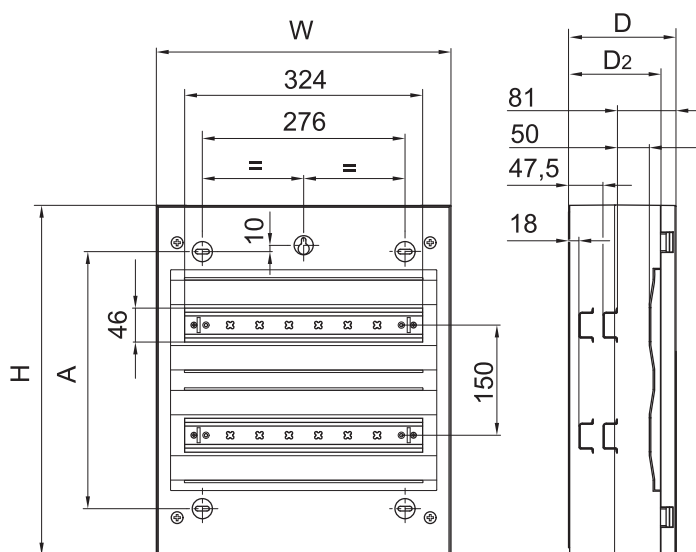
Mini Gamma



Dimensions

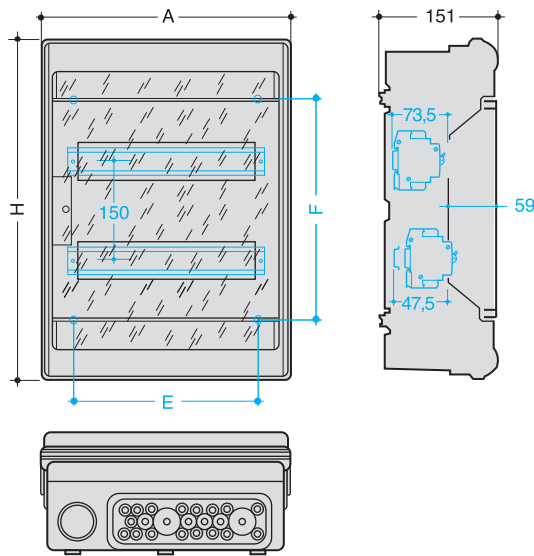
References	Dimensions (mm)			Fixing centers	
	A	H	depth	E	F
GD102E	55	160	82	-	-
GD104E	110	180	82	86	114
GD106E	146	180	82	124	114
GD108E	182	180	82	158	114
GD110E	218	180	82	194	114

Vega



	A [mm]	H [mm]	W [mm]	D [mm]	D ₂ [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

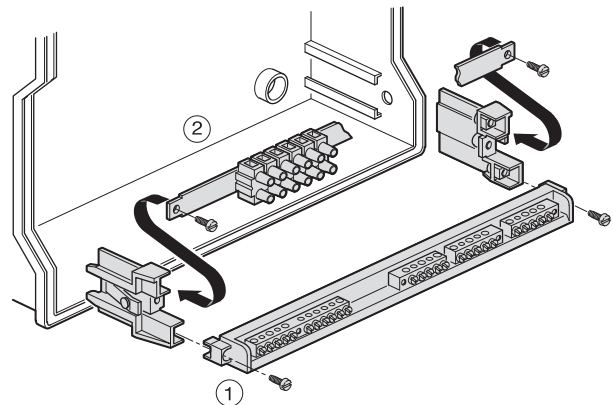


Dimensions in mm

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



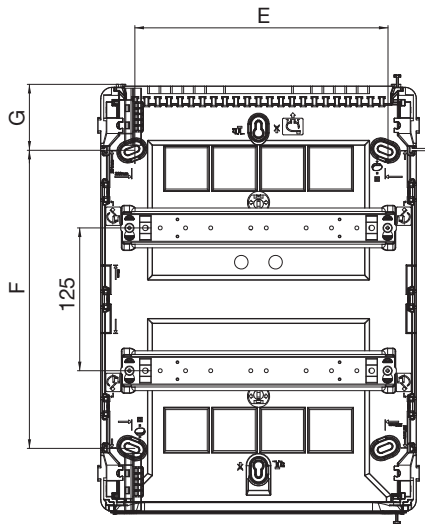
Ref.	knock outs	side mounted
VE103L	2 x M20	-
VE106R	1 x M20 + 1 x M25 + 1 x M20/32	2 x 16
VE110L	1 x M20/32 + 1 x M25 + 3 x M20	2 x 16
VE112R	2 x M20/32/40 + 2 x M25/32 + 3 x M25 + 6 x M20	2 x 21
VE212R	1 x M20/40/50 + 2 x M20/32 + 12 x M25 + 2 x M20	2 x 21
VE312R	2 x M20/32/40 + 2 x M25/32 + 3 x M25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

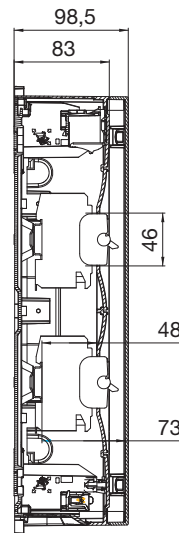
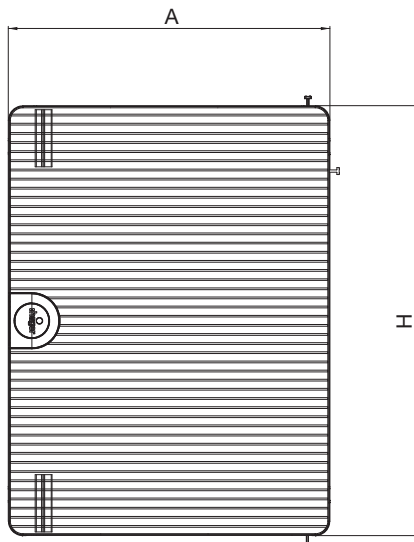
Cable entries top/bottom

One side cable entry optimised for use of trunking, knockout-type.

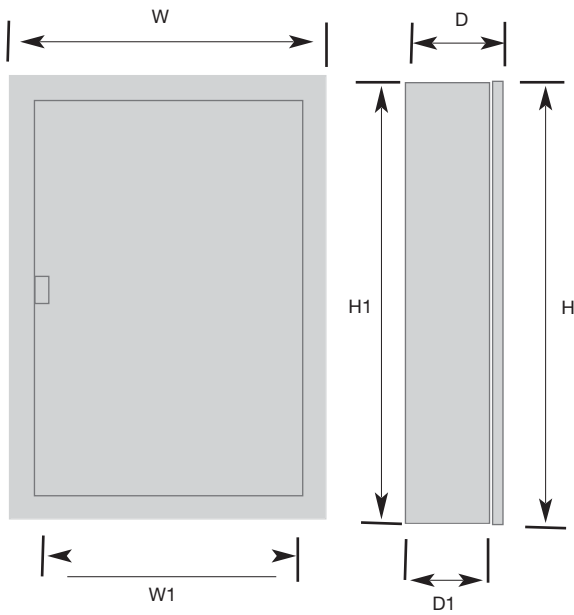
The other side pre cuts with diameters 20 mm, 25 mm, 32 mm and 40 mm the wall box is 180° turnable.



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

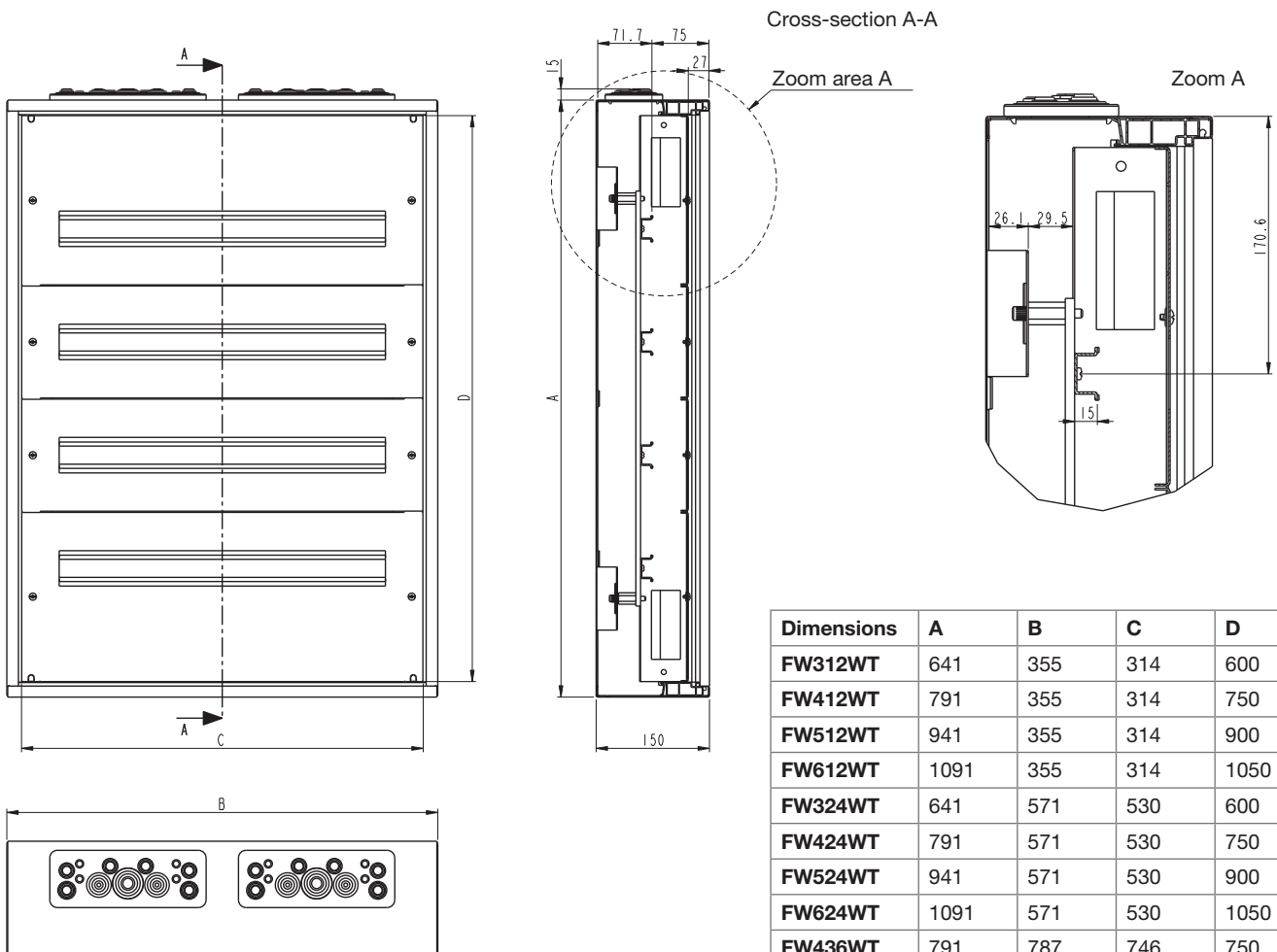


DR Metal Enclosure (surface)



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, optionally 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 :

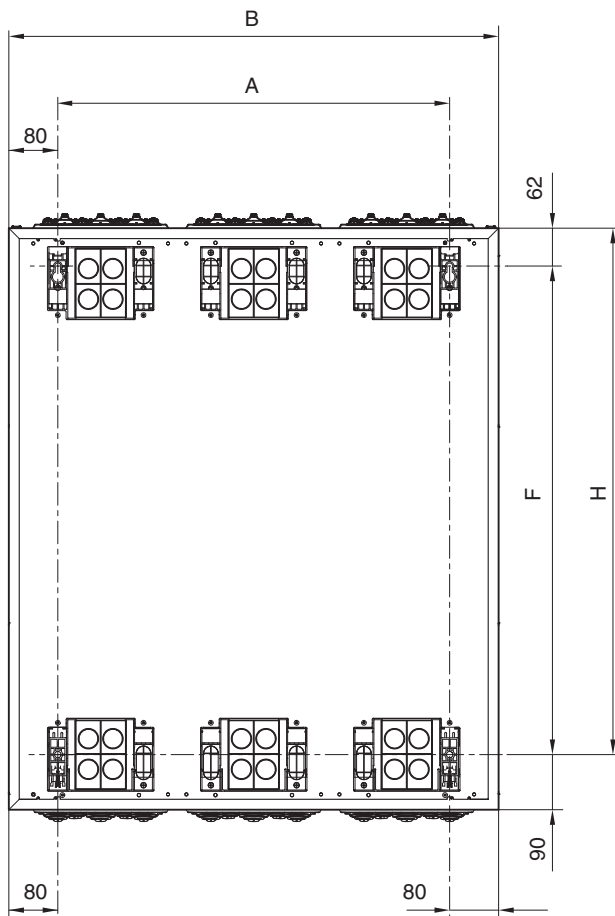
Steel, galvanised

Covers and knockouts :

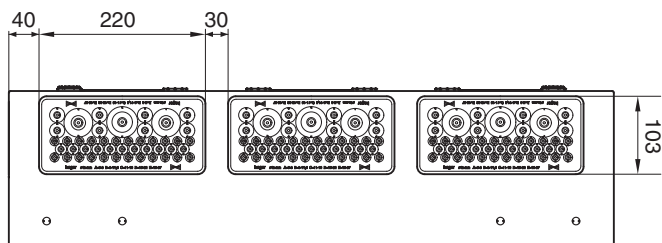
Plastic

	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

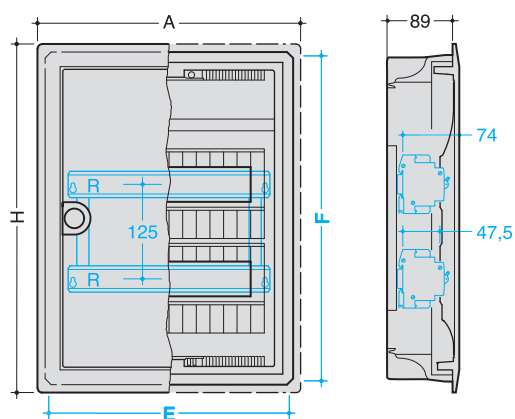
FWB surface enclosures



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



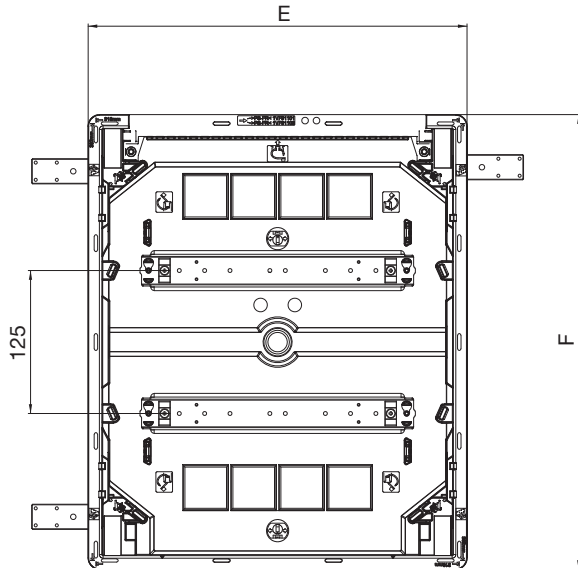
Dimensions in mm

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).



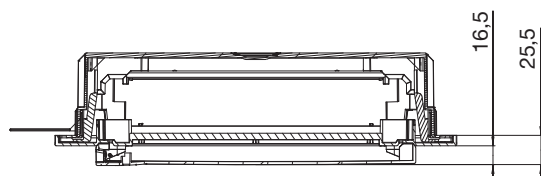
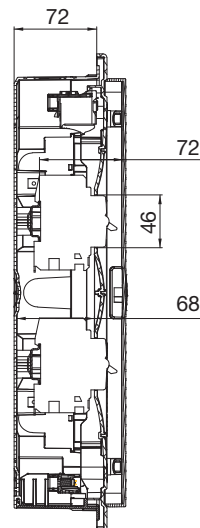
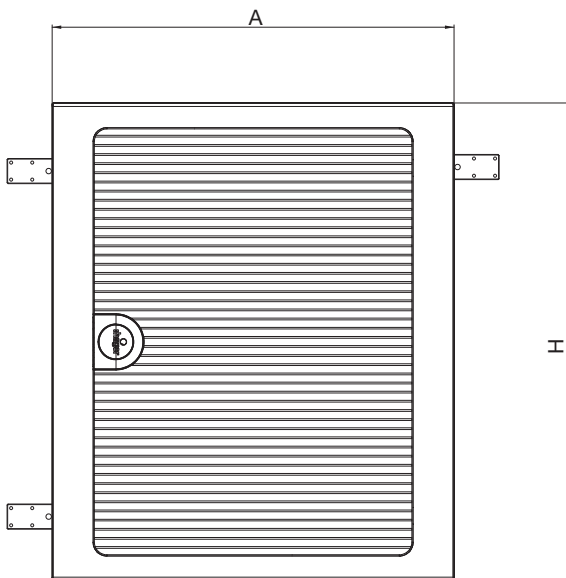
Side

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 :

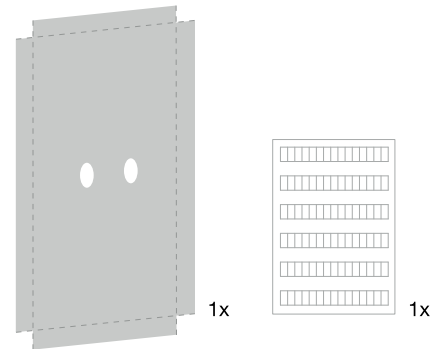
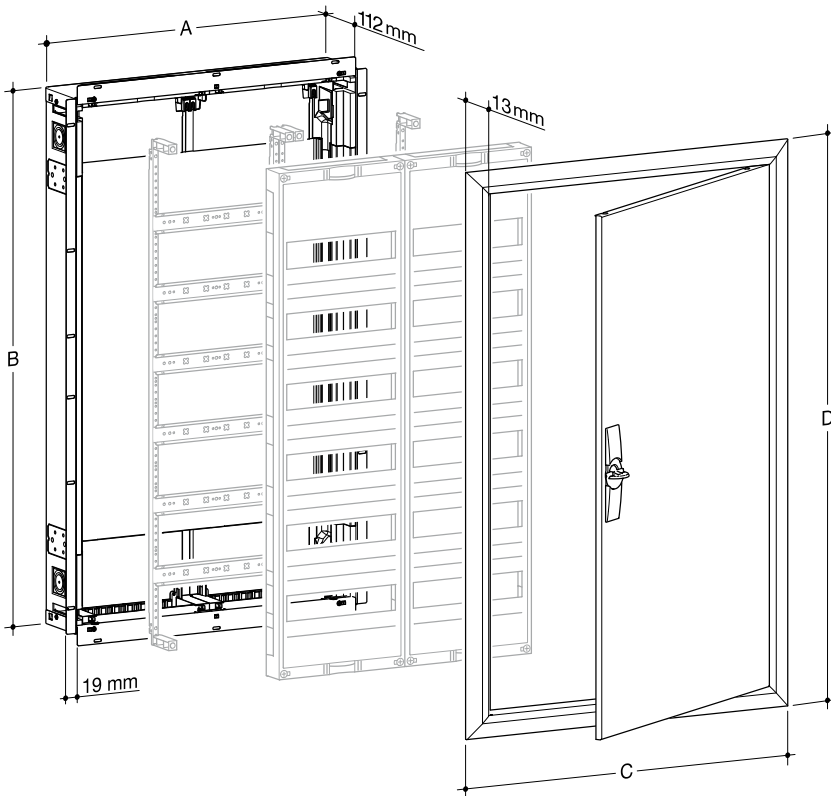
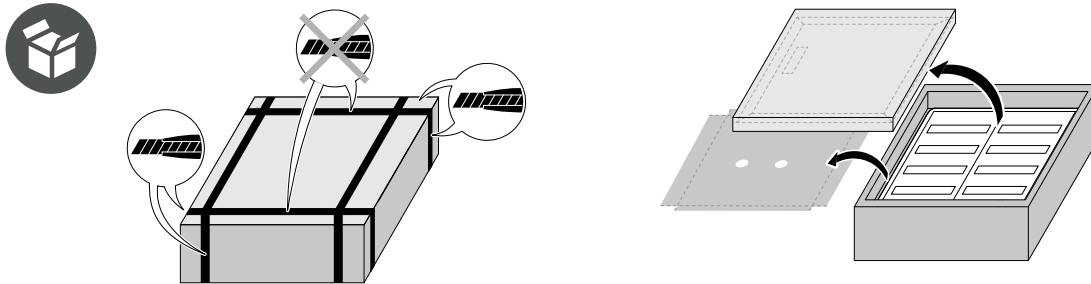
Steel, galvanised

Covers and knockouts :

Plastic

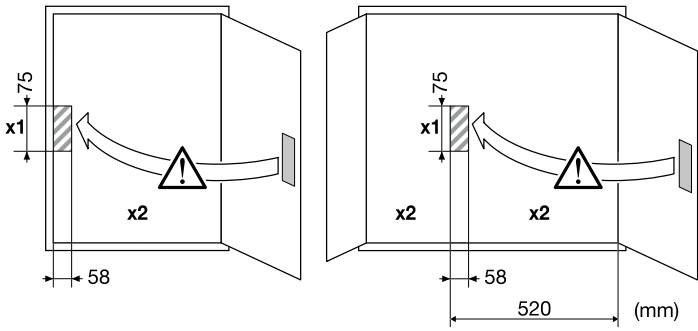
	height (mm)	width (mm)	depth (mm)	DIN rails (12 z)	fields across	Nr of modules	IP class (standard)
FWU31S	500	300	112	3	1	36	IP30
FWU32S		550	112	3	2	72	IP30
FWU33S		800	112	3	3	108	IP30
FWU41S	650	300	112	4	1	48	IP30
FWU42S		550	112	4	2	96	IP30
FWU43S		800	112	4	3	144	IP30
FWU51S	800	300	112	5	1	60	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

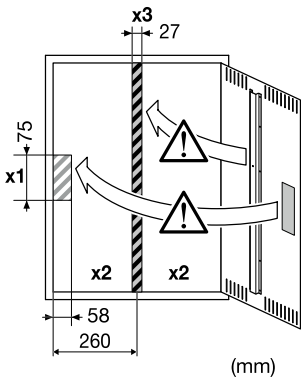


	A (mm)	B (mm)	C (mm)	D (mm)
FWU31..	310	502	353	553
FWU32..	560	502	603	553
FWU33..	810	502	853	553
FWU41..	310	652	353	703
FWU42..	560	652	603	703
FWU43..	810	652	853	703
FWU51..	310	802	353	853
FWU52..	560	802	603	853
FWU53..	810	802	853	853
FWU61..	310	952	353	1003
FWU62..	560	952	603	1003
FWU63..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

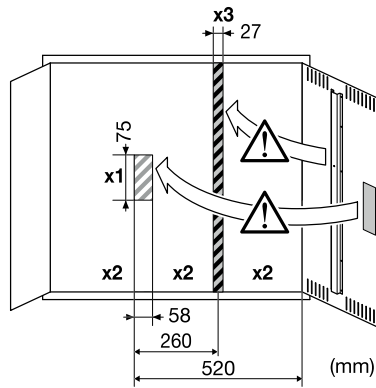
FWU31, 41, 51, 61, 71... FWU33, 43...



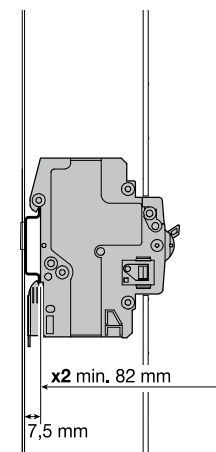
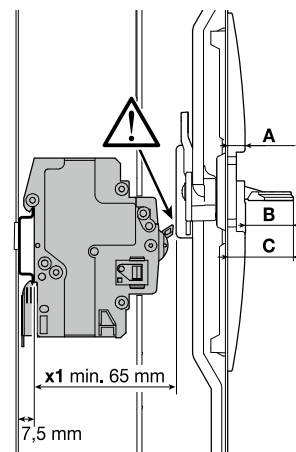
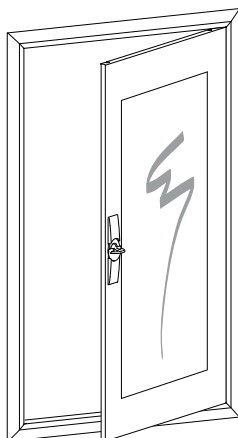
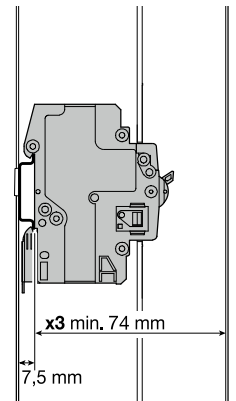
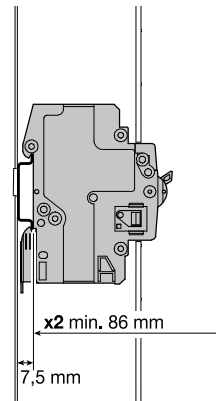
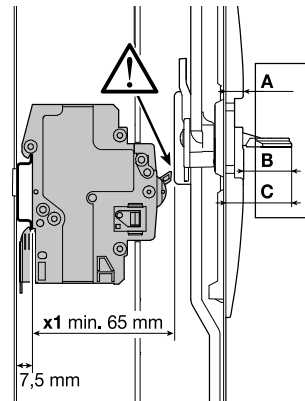
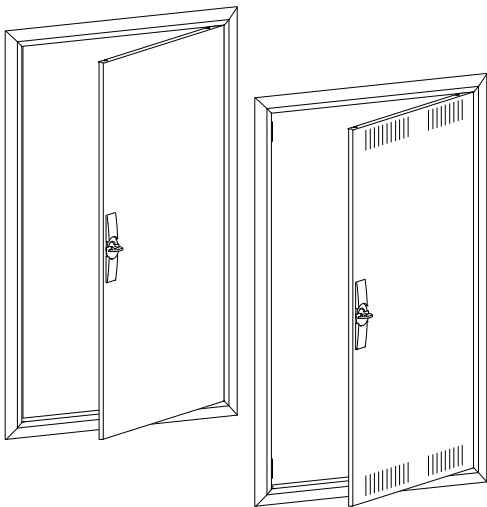
FWU52, 62, 72...



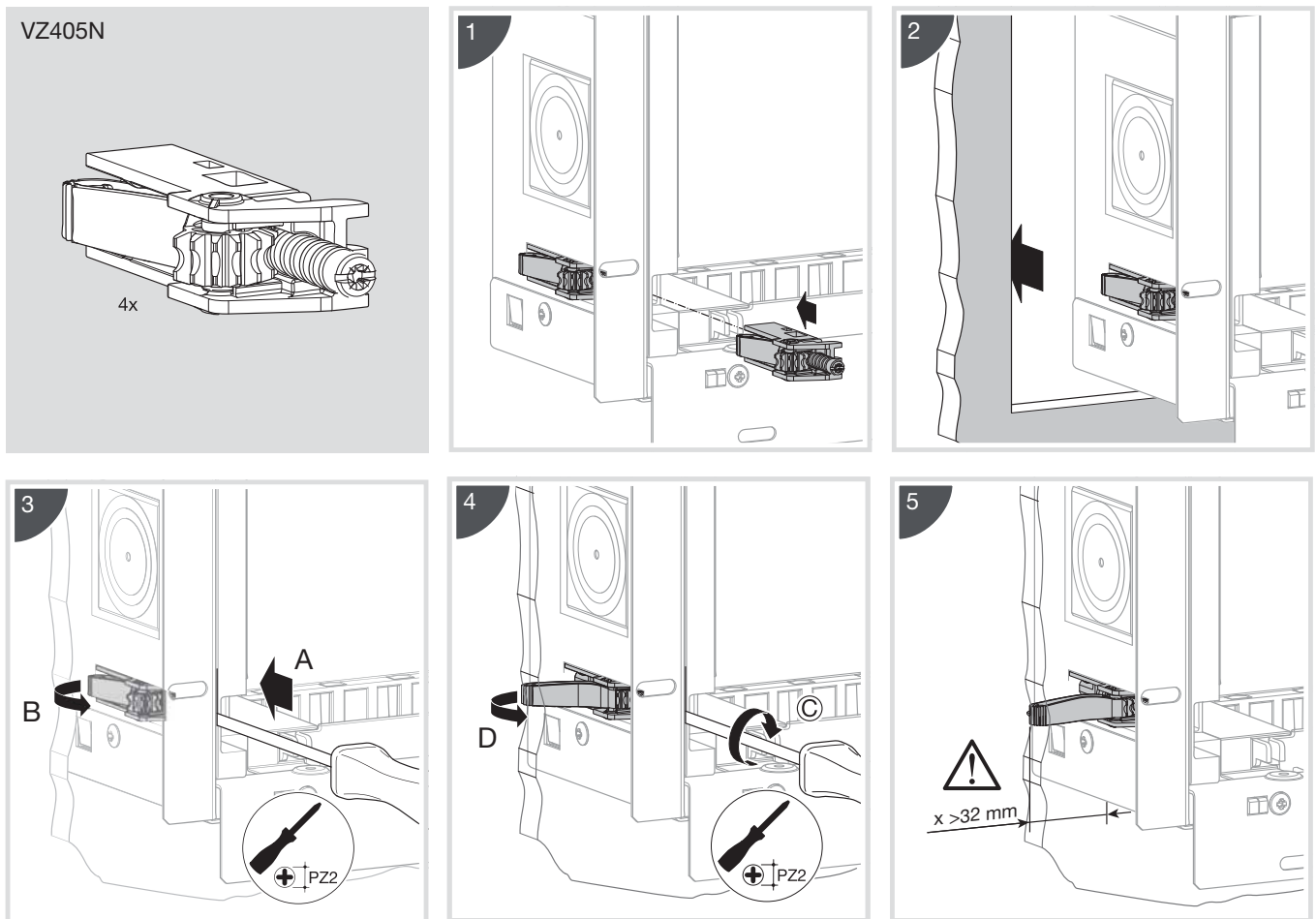
FWU53, 63, 73...



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



Mounting Hollow Wall Anchor Accessory

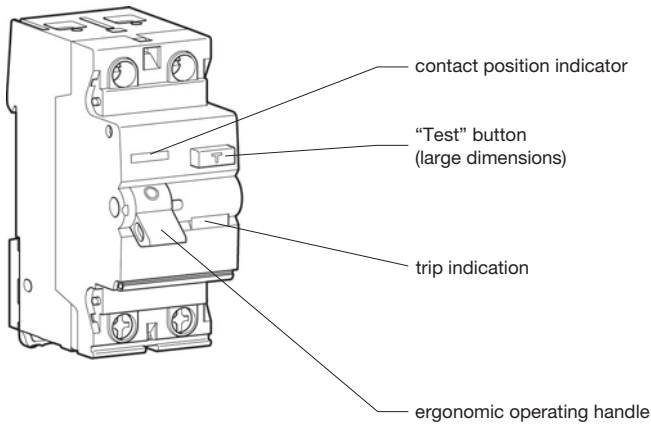


Mounting the VZ405N hollow wall anchor in wall cabinets.

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.

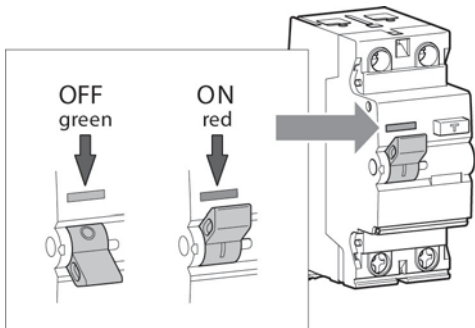
Trip indicator

The status of the RCCB can be visualised by the colour of the trip indicator in addition to the position of the operating lever.

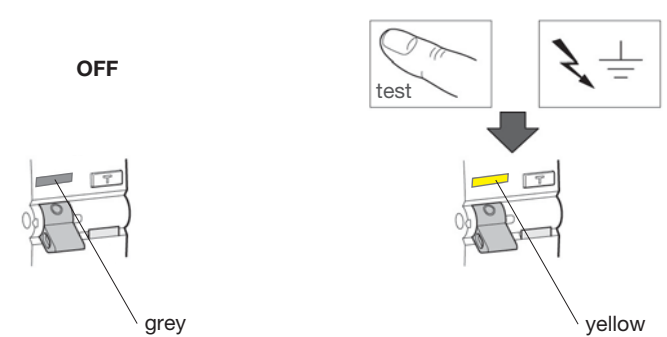
- Grey indication for normal conditions (even when operating lever is in ON/OFF position)
- Yellow indication for tripped condition, operating lever in OFF position.

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 (I_{res}) 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.

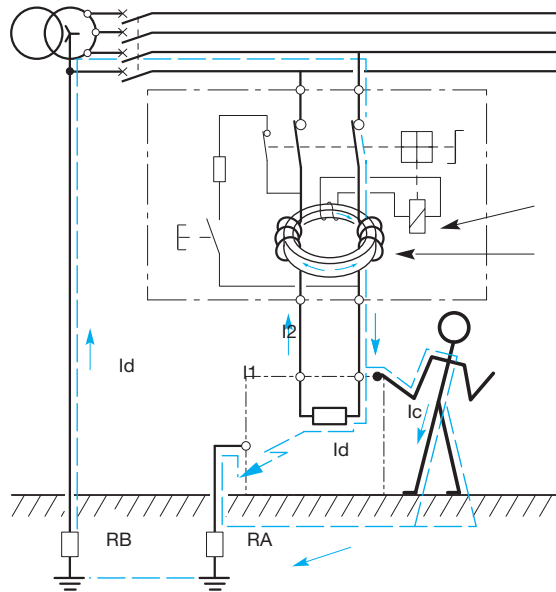
RCCBs are not suitable for use on DC systems and unearthed networks.

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 I₃
 $I_{res} = I_1 - I_2 + I_3 = I_3$

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.

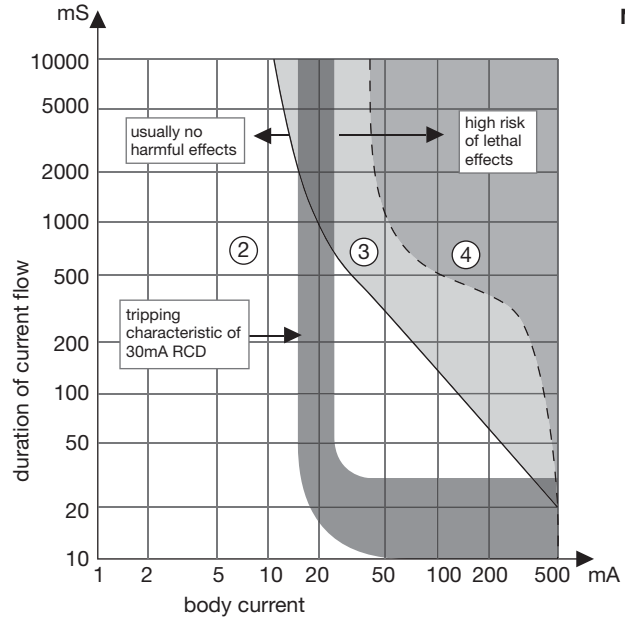
Additionally an RCCB used for this purpose should have:

- 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



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, $RCCB \leq 0.5A$ 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.

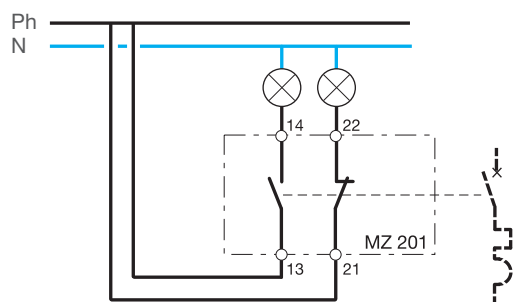
MZ206 Under Voltage Release*

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

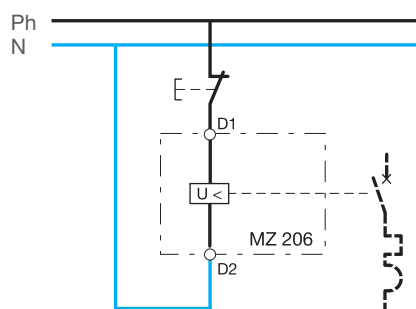
* Indication that the product has tripped due to the Voltage release is provided by a flag on the product.

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

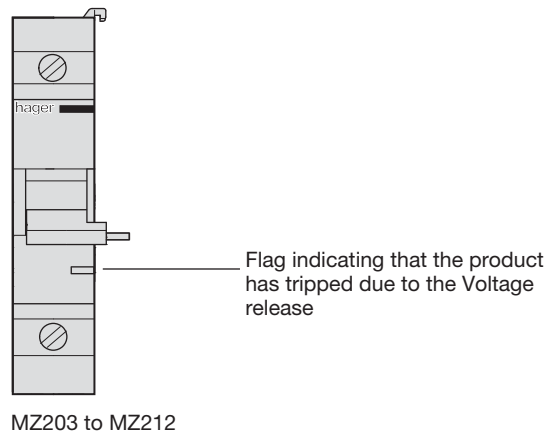
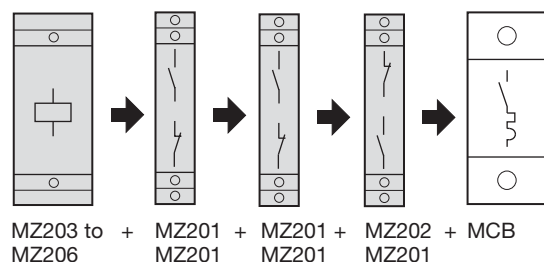
Power - 8VA
tolerance : -15% of Un

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).



		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... U_c
Rated voltage	U_c	350V (50/60 Hz)
Voltage protection level	U_p	$\leq 1.5kV$
Residual current	I_{PE}	$\leq 0.01mA$
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	$I_{sc cr}$	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	$\leq 0,5 m$
	B	a + b	$\leq 0,5 m$

L1, L2, L3, N, PE, \

TT/TNS Serial Wiring

F1 A gG	$S_L = S_N$ mm ²	S_{L1} mm ²	$S_{PE(N)}$ mm ²
40	61	66	
50	10	16	10
63	10	16	10
80	16	16	16
100	25	16	16
125	35	16	16

F1 gG	
F1	F1 $\leq 125 A$
	OK
	F1 > 125 A
	TNS parallel

TT/TNS Parallel Wiring

F1 A gG	F2 A gG	$S_L = S_N$ mm ²	$S_{PE(N)}$ mm ²	S_{L1} mm ²
40		6	6	16
50		6	6	16
63		6	6	16
80		10	10	16
100		10	10	16
125		16	16	16
160		16	16	16
200		25	25	16
250		35	35	16
315		35	35	16
400	≤ 250	35	35	16
≥ 500	≤ 315	35	35	16

F1 - F2 gG	
F1	F1 > 315A
	F2 $\leq 315 A$
F2	F1 $\leq 315 A$
	OK

Fault Indication

AC: 250 V / 1A
DC: 125 V / 0.2A

7 mm 7 mm

max. 1,5 mm

0,25 Nm

Grün/Green/Vert/
 Zielony/Verde/
 Zelená → OK

Rot/Red/Rouge/
 Czerwony/Vermelho/
 Červená → ~~OK~~

Connection

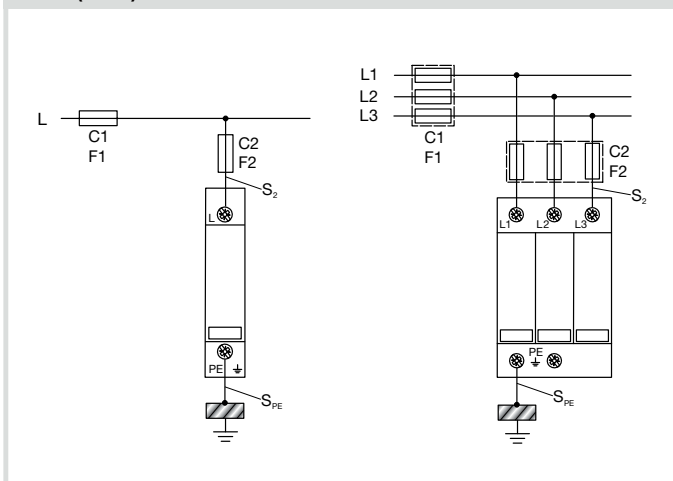
SPA081 SPA001N

B
 A
 ≥6.5 mm
 Click!

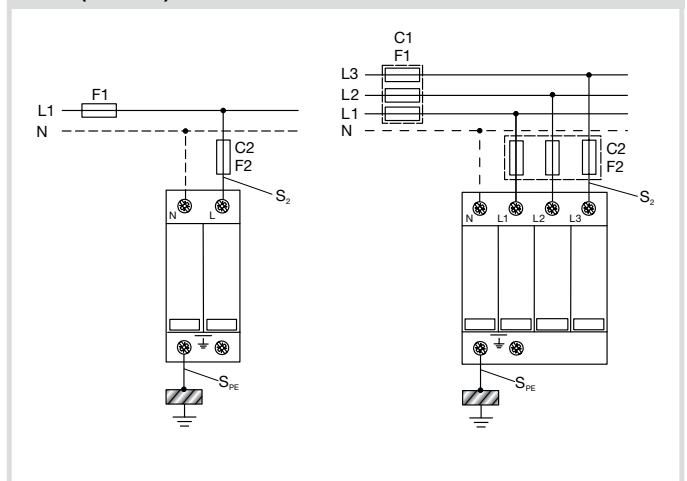
		SPBX15D/R	SPBX40D/R	SPBX65R
Tested to			EN 61643-11, IEC 61643-11	
TT/TN/TNC-S			OK	
Nominal voltage	U_n		240/415V (50/60Hz)	
Residual current (N-PE)	I_{PE}		<5 μ A (SPB2xxx, SPB4XXX) <0.4mA (SPB1XXX, SPB3XXX)	
Rated loaded current	I_{fi}		100A _{rms}	
Humidity			5% ...95%	
9°C			-40/+80°C	
Ports			1	
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 μ s)	I_n	5kA	20kA	20kA
Maximum discharge current (8/20 μ s)	I_{max}	15kA	40kA	65kA
Voltage protection level	U_p	\leq 1kV	\leq 1.35kV	\leq 1.45kV
C2 max. hager		32A "C"	32A "C"	63A "C"
F2 max		125A gG	125A gG	160A gG
Short circuit current rating	I_{sc}	25 kA _{rms}	25 kA _{rms}	25 kA _{rms}
Replacement cartridge L-N		SPB015D	SPB040D	SPB065R
Replacement Cartridge N-PE		SPB040N	SPB040N	SPB065N

	L x W x H (mm)	L x W x H (mm)
	$I_{max} = 15 \text{ kA}, 40 \text{ kA}$	$I_{max} = 65 \text{ kA}$
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 x 98.7	77.5 x 53 x 98.7
4P	65.7 x 71 x 98.7	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 ↓ ⊗	F1 ≤ 160 A gG ↓ ⊗

Backup MCB* (I_{sc} = 10 kA)

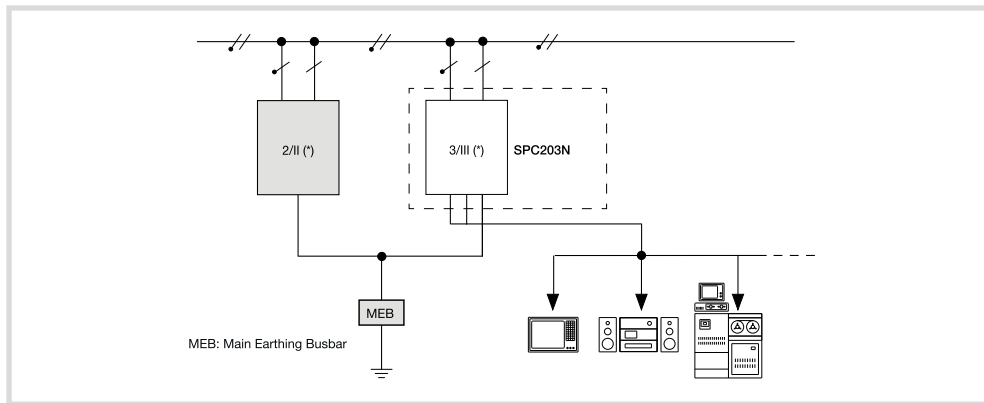
	SPBX15D/R SPBX40D/R	SPBX65R
C1	C1 >32A "C" ↓ C2 ≤ 32A "C"	C1 >63A "C" ↓ C2 ≤ 63A "C"
C2	C1 ≤ 32A "C" ↓ ⊗	C1 ≤ 63A "C" ↓ ⊗

Type			SPBX15x SPBX40x	SPBX65R
F1 A/gG	S ₂ mm ²	S _{PE} mm ²	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

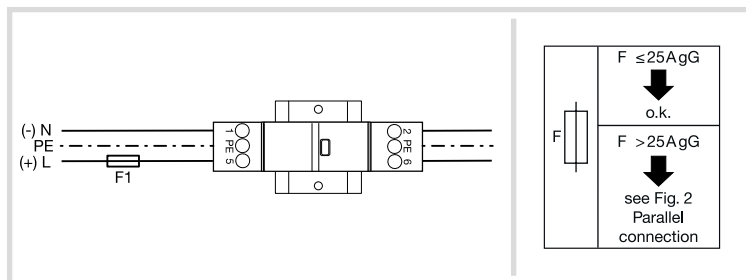
Tested to		EN 61643-11, IEC 61643-11
System		TNS-TT
F1 max		25A/32A (gG/B/C)
Nominal discharge current (8/20 μ s)	I_n	L(N)/PE, L/N = 5kA
Short circuit current rating	I_{sccr}	10kA _{rms}
Residual current (N-PE)	I_{PE}	<5 μ A
Nominal voltage	U_n	230 V (50/60 Hz)
Rated voltage	U_c	264 V (50/60 Hz)
	U_{oc}	L(N)/PE, L/N = 6kV
Voltage protection level	U_p	L/N \leq 1.4kV, L(N)/PE \leq 1.4kV
Humidity		5%...95%
θ 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



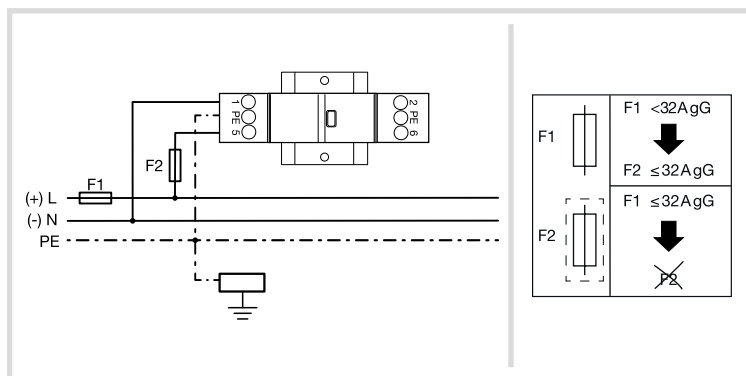
Serial Connection

Backup Fuse



Parallel Connection

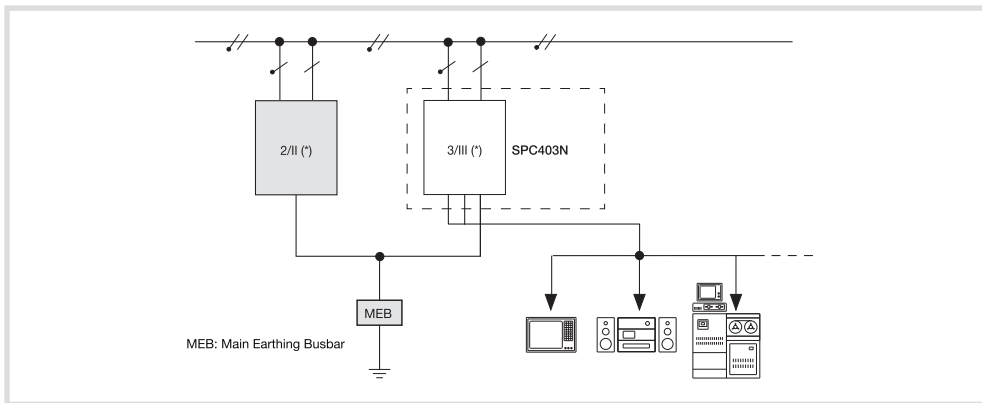
Backup Fuse



Characteristics

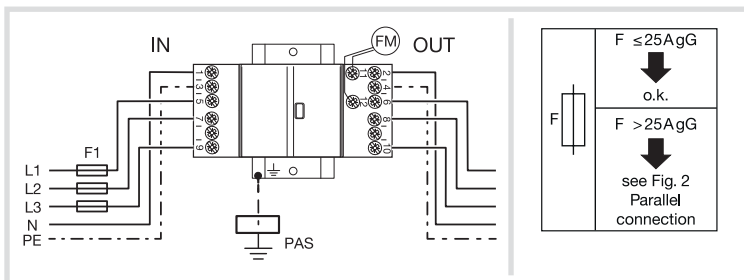
Tested to		EN 61643-11, IEC 61643-11
System		TT, TN
F1 max		25A (gG/B/C)
Nominal discharge current (8/20 μ s)	I_n	L1-L2-L3(N)/PE, L1-L2-L3/N = 3kA
Short circuit current rating	I_{sccr}	15kA _{rms}
Residual current (N-PE)	I_{PE}	<5 μ A
Nominal voltage	U_n	230 V/400 V (50/60 Hz)
Rated voltage	U_c	264 V (50/60 Hz)
	U_{oc}	L1-L2-L3(N)/PE, L1-L2-L3/N = 6kV
Voltage protection level	U_p	L1-L2-L3/N \leq 1.4kV, L1-L2-L3/N/PE \leq 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



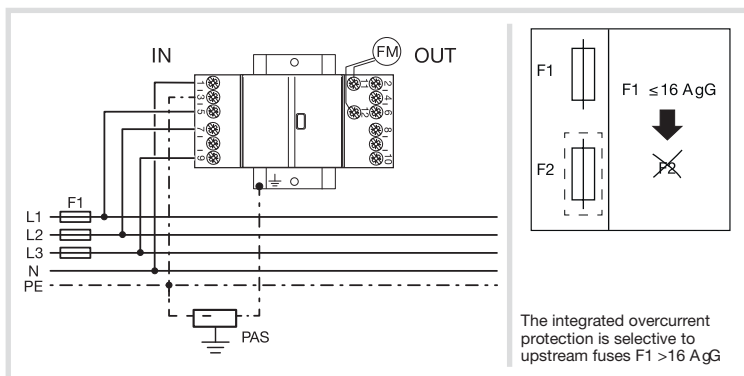
Serial Connection

Backup Fuse



Parallel Connection

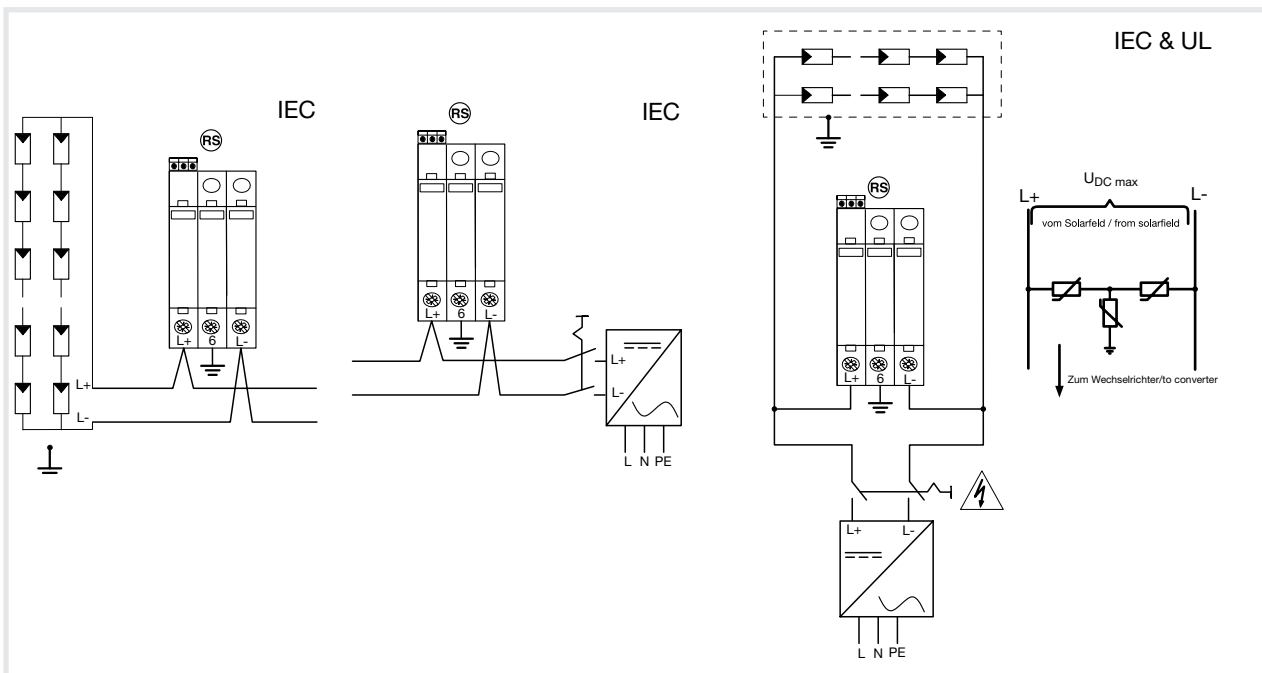
Backup Fuse



Characteristics

Tested to		EN 50539-11
Voltage protection level	U_p	$\leq 3.7kV$
Rated voltage	U_{cpv}	$\leq 1170 V DC$
Nominal Discharge Current (8/20 μs)	I_n	15kA
Short Circuit Current Rating	I_{scpv}	2000A
	I_L	80A
	I_{max}	40kA (8/20 μs)
Residual Current AC	$I_{pe,AC}$	$\leq 250\mu A$
Residual Current DC	$I_{pe,DC}$	$\leq 20\mu A$
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



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 a 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.

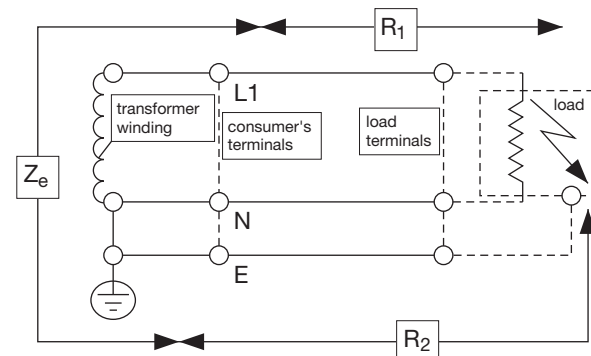
Two important measures must be taken to prevent this hazard:

- the impedance of circuit conductors is kept to a minimum.
- The earth fault loop impedance (Z_e) 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_e) in a system.



(Earth fault at load between conductor and casing).

$$Z_e = Z_e + (R_1 + R_2)$$

Earth fault loop impedance (Z_e)

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.

Z_e - 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:

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:

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

* 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.

Z_s 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

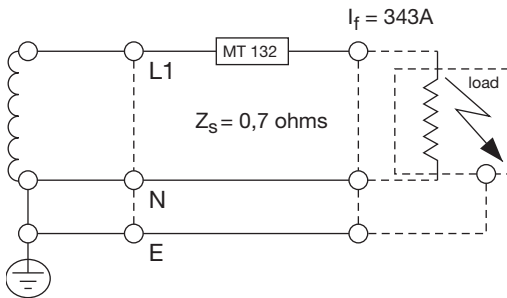
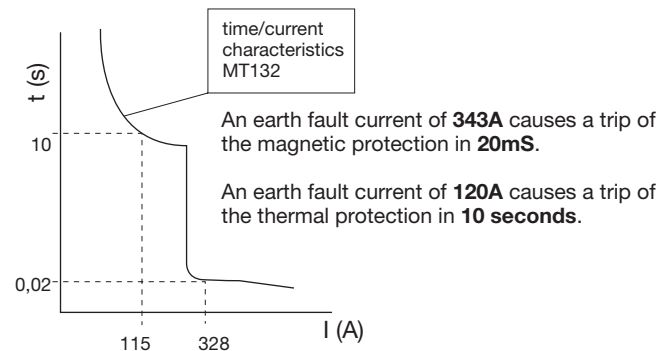


Diagram above shows a fixed circuit with an earth loop impedance Z_s of 0.7 ohms protected with an MT 132. The fault current (I_f) will therefore be $U_o/Z_s = 240/0.7 = 343A$

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 I_2 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:

U _e :	rated service Voltage
U _i :	rated insulation Voltage (> U _{emax})
U _{imp} :	rated impulse withstand
I _{cm} :	rated short circuit making capacity
I _{cn} :	rated short circuit capacity
I _{cs} :	rated service short circuit breaking capacity
I _{cu} :	rated ultimate short circuit breaking capacity
I Δ n :	rated residual operating current (often called residual sensitivity)
I _n :	rated current = maximum value of current used for the temperature rise test
Δ t :	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 I_{cs} is also included which is equal to the rated short-circuit capacity I_{cn} for short-circuit capacity values up to and including 6kA, and 50% of I_{cn} above 6kA with a minimum value of 7.5kA. As the circuit-breakers covered by this standard are intended for household and similar uses, I_{cs} is of academic interest only. The rated short-circuit capacity of a MCB (I_{cn}) 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. I_{cn} is shown on the MCB label in a rectangular box without the suffix 'A' and is the value which is used for application purposes. I_{cn} (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 :

$$\text{Joules} = I^2 \times R \times t \text{ or because we know that watts} = I^2 R$$

$$\text{Joules} = \text{watts} \times \text{seconds}$$

Therefore we can say that :

$$\text{One Joule} = \text{one watt second}$$

$$\text{or energy} = \text{watts} \times \text{seconds} = I^2 R t$$

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

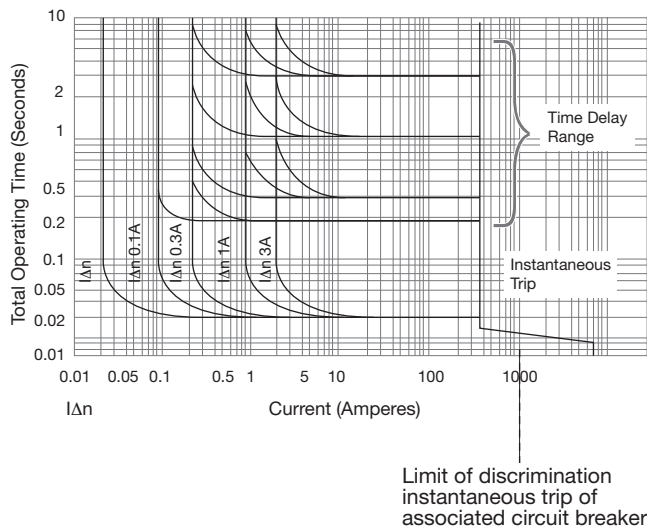
References	MJN MHN	MLN	Ax8xxx	Ax9xxx
poles	Ph+N	Ph+N	Ph+N	Ph+N
nominal current In (A)	2 to 40	2 to 40	6 to 40	6 to 40
breaking capacity to IEC/EN 60 898				
230V	4500A	6000A	4500A	6000A
400V	-	-	-	-
breaking capacity to IEC/EN 60 947-2				
230V	6kA	7,5kA	6kA	10kA
400V	-	-	-	-

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	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	0,2	0,3	1,0	3,0	0	0,3	1,0	3,0	0	0,3	1,0	3,0
0,01A	0																						
	0,2																						
0,03A	0																						
	0,2																						
	0,3																						
	1,0																						
0,1A	0																						
	0,2																						
	0,3																						
	1,0																						
0,3A	0																						
	0,2																						
	0,3																						
	1,0																						
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 I_{sc} should be placed on each polarity.
- Network insulated to the earth:
The number of poles required to break I_{sc} should be split between the two polarities.

Information

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

Table 1			breaking capacity (kA) L/R = 15ms				
range	I _n	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
	0,5 to 20A	1P	25	25	20	-	-
		2P	35	35	25	15	-
		3P	40	40	35	20	-
		4P	45	45	40	25	10
NRN NSN, NQN	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

Table 2 magnetic trip		⇒	⇒	⇒	√
		I _{n1}	I _{n2}	I _{m1}	I _{m2}
curve B	AC M 50Hz	1,13 I _n	1,45 I _n	3 I _n	5 I _n
	DC ...	1,13 I _n	1,45 I _n	4 I _n	7 I _n
curve C	AC M 50Hz	1,13 I _n	1,45 I _n	5 I _n	10 I _n
	DC ...	1,13 I _n	1,45 I _n	7 I _n	15 I _n
curve D	AC M 50Hz	1,13 I _n	1,45 I _n	10 I _n	20 I _n
	DC ...	1,13 I _n	1,45 I _n	15 I _n	30 I _n

c) earthing system types

earthing diagrams TT, TNS, TNC		IT system isolated to the earth	
a polarity connected to earth	earthed center point		
<p>- 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.</p>	<p>- Network connected to the earth - middle point earthed: The number of poles required to break I_{sc} should be placed on each polarity.</p>	<p>- Network insulated to the earth: The number of poles required to break I_{sc} should be split between the two polarities.</p>	<p>- Network connected to the earth - middle point earthed: The number of poles required to break I_{sc} should be placed on each polarity.</p>

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 I _{th} (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 (U _i)	440V			440V			440V						
Rated impulse withstand voltage U _{imp}	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 I _{sw} (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



Hager Ltd. - Ireland

Unit M2
Furry Park Industrial Estate
Swords Road
Santry
Dublin D09 NY19
Ireland

Tel: 0818 551502
Fax: 0818 551503
Technical Support: +353 1 5180844

hager.ie
customer.service@hager.ie
technical.service@hager.ie