GE
Industrial Solutions

WORLDWIDE PARTNER

New

QuiXtra™ 4000

Low Voltage Distribution Boards up to 4000A

GE imagination at work

QuiXtra™4000

Low Voltage Distribution Boards

Safe

- Design verification tested system enclosure
- Certified according to the new IEC 61439-2
- IP55 with door and IP55 panels, IP30 with door and IP30 panels and IP 30 without door.
- Internal segregation up to Form 3
- Tempered glass for transparent door

Simple and flexible

- 1 enclosures height: 12 rows of 150 mm
- 3 enclosures width: 12, 24 and 36 modules
- 3 enclosures depth: 450, 600 and 800 mm
- Side to side and back to back coupling
- 1 functional unit = 1 reference, including all parts to mount LV devices
- Modular concept: all functional units in steps of 50 mm in height
- Corner enclosure for L- or U-shape

Door ready to mount

- 4 point locking system already mounted
- Hinges mounted
- Installation without tools
- 135° open angle

Attractive design

- Fits perfectly in commercial environments
- Colours RAL 9006 and RAL 7024
- One common line QuiXtra 630 and QuiXtra 4000

Easy and quick to assemble

- Assembly by a single person
- Pre-assembled captive screws for coverplates
- 90° screws for cover plates
- Click-in supports for functional units. No tools needed to fix them to the frame
- Reduced number of tools

Rigid and sturdy

- Rigid frame built with open profiles screwed to corner parts
- Sheet metal 1.5 and 2 mm thick
- Die-cast zamak corner parts

PowerDesign

New generation of software to help customers with the configuration, design and quotation of low voltage system enclosures: QuiXtra 630 and QuiXtra 4000

Applications

QuiXtra 4000 has been developed as a range of system enclosures, expansion of the line of QuiXtra 630. GE's complete solution for low voltage distribution boards up to 4000A for high commercial and industrial environments.

QuiXtra 4000 is delivered as a flat kits, to be assembled, equipped and wired by a panel builder or installer. The QuiXtra 4000 range consists of 9 floor standing enclosures, combination of 3 different widths and 3 depths, as well as busbars and functional units to easily integrate all types of low voltage electrical devices up to 4000A.

The combination of the QuiXtra 4000 enclosure and original GE LV electrical devices are certified according the new standard IEC 61439-2.

Industrial and Infrastructures
- Construction materials
- Water applications
- Ports
- Tunnels
- Small factories
- Waste recycling
- Cement
- Food and beverage
- OEM
- Components/parts production
- Small assembly lines
- Printing

Commercial
- Large commercial offices
- Shopping malls
- Airports
- Hospitals
- Banks
- Public transport
- Railways
- Subways
- Governmental buildings
- Telecommunication
- Data/call centers

Description

QuiXtra 4000 is a range of sheet steel system enclosures delivered as **flat kit**. It is GE's solution for low voltage distribution boards up to 4000A, in commercial and industrial environments.

QuiXtra 4000 is designed to be a reliable, simple, flexible and easy to use system enclosure, with the added value of its fresh and attractive design, expanding the benefits of QuiXtra 630.

The QuiXtra 4000 range consists of **9 different enclosures**. There are three enclosure depths available, 450 mm, 600 mm and 800 mm, and three enclosure widths, for functions of 12, 24 and 36 modules. All enclosures have the same useful height of 1800 mm. It is possible to couple enclosures of the same depth horizontally, and back to back the enclosures with the same width. Additionally, there are corner empty enclosures to allow L and U configurations. This huge range of enclosures provides the user total flexibility to define the layout of the LV distribution boards.

For ease of incoming and outgoing cable connection, the roofs have different types of cable entry plates available. As well, the bases are available with entry cable plates, for bottom incoming or outgoing.

QuiXtra 4000 offers **2 types of doors**, plain and transparent (tempered glass). In both cases, the 4 points locking mechanism is operated by a central handle with key. The doors are delivered with hinges and locking mechanism already mounted, to reduce assembly time.

QuiXtra 4000 introduce several features to reduce the assembly time of the panel. The **functional units** are fixed to the frame by use of the **"click in" supports**, without the need of additional screws. The cover plates are fixed to the frame using 90° screws and there is the possibility to fix all of them to one functional door to make maintenance operations easier. The doors are ready to assemble to the frame without tools.

All external panels, like rear or sidepanels as well as the roofplate, may be removed to facilitate assembly and wiring.

All GE LV electrical devices up to 4000A can be easily assembled in QuiXtra 4000 using the appropriate functional units.
Each **functional unit kit** includes everything necessary for assembly:

- A mounting plate or DIN-rail
- A support to attach to the enclosure. For some functions, if a depth profile is required, they are delivered separately
- A coverplate (with precise cut-outs)
- The required screws and other fixation parts. Attaching the mounting plates or DIN-rails does not require tools: they are attached to the side mounting profile using a "click in" support. The coverplates are attached to a functional frame using captive 90° screws.

The **busbar system** in QuiXtra 4000 is based on copper bars of 10 mm thickness. The horizontal main busbars is assembled at the rear of the enclosure for the ones of 450 mm in depth and on the top or middle in the 600 mm and 800 mm depth. There are 3 possible vertical busbars, with a plain layout, assembled at the rear or in the side of the enclosure, or in staircase, assembled on the integrated cable compartment or in the enclosure 12 modules width. Several ready to install copper connection between the incomers and the main busbars are available.

QuiXtra 4000 can be configured with a protection degree IP30 or IP55, and a segregation form up to **Form 3b**

The QuiXtra 4000 colour is white aluminium, **RAL 9006**.
The external corner parts, the handle and the base are in dark grey, **RAL 7024**. The tempered glass of the transparent door is lightly smoked grey.

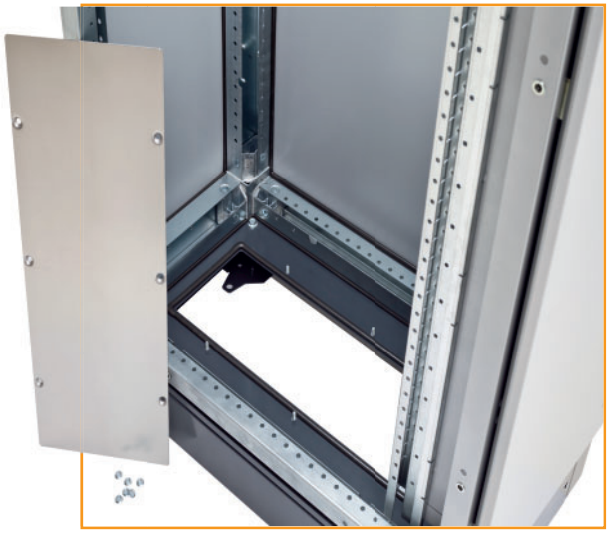
Features and benefits

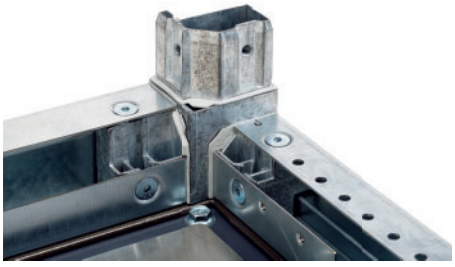
Simple and flexible
- Enclosures widths for 12, 24 and 36 modules
- Enclosures depths of 450 mm, 600 mm and 800 mm
- Side by side and back to back coupling
- Modular concept. All functions in steps of 50 mm in height
- Functional kits for GE low voltage electrical devices up to 4000A
- Mounting of GE devices in vertical or horizontal position
- The 10 mm thickness busbars can be assembled on top, at the rear or in vertical
- Each functional unit includes all parts necessary for assembly: mounting plate or DIN- rail, supporting brackets, cover plate (with precise cut-outs) and all required fixation elements
- Corner enclosure with depth 450, 600 and 800 mm for L- and U-shapes.

Easy and quick to assemble
- "Click in" supports for functions. Reduced number of tools needed
- 90º screws for cover plates
- Pre-assembled captive screws for coverplates
- Accessories to facilitate panel wiring and assembly. Ready to assemble copper connections
- Door assembly without tools. Doors delivered with locking system and hinges pre-mounted
- Generous wiring space for all functions
- Optional functional door to fix all the coverplates
- Markings in the fixation profiles to quickly position the functional units and cover plates

Safe for users, reliable and sturdy
- Verification tested system enclosure, certified according to the new IEC 61439-2 standard
- IP55 with door and IP55 panels
- IP30 without door or with door and IP30 panels
- External panels sheet steel, 1.5 mm, power coated
- Door sheet steel, 1.5 mm, power coated
- Rigid frame built with bent sheet steel profiles fixed to zamak corner parts
- Internal segregation: Form 3b
- Tempered glass for the transparent door

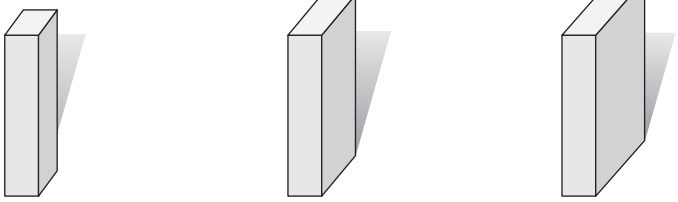
Attractive design
- One common line: QuiXtra 630 and QuiXtra 4000. Same benefits, same aesthetics
- Combination of two colours: RAL 9006 (metallic silver) and RAL 7024 (dark grey)





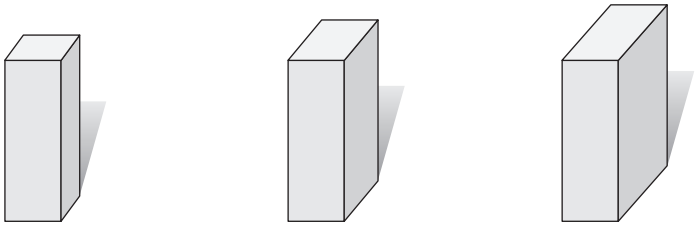
Full enclosure range

12 modules - external width: 447 mm



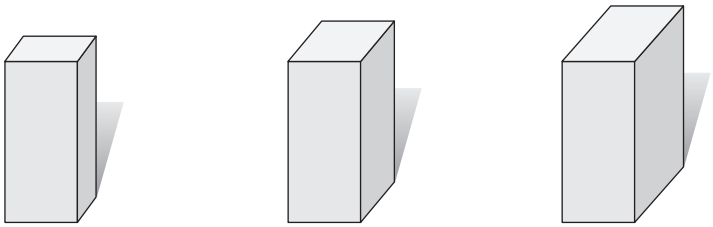
H	**1800**/2155	**1800**/2155	**1800**/2155
D	**375**/450	**525**/600	**725**/800

24 modules - external width: 743 mm



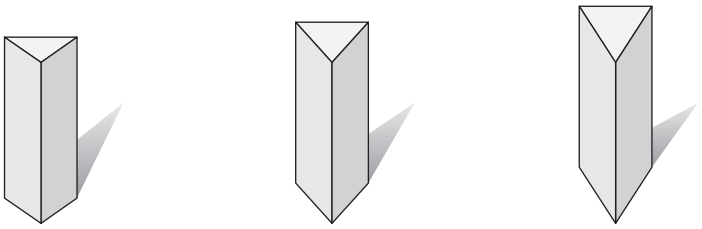
H	**1800**/2155	**1800**/2155	**1800**/2155
D	**375**/450	**525**/600	**725**/800

36 modules - external width: 959 mm



H	**1800**/2155	**1800**/2155	**1800**/2155
D	**375**/450	**525**/600	**725**/800

Corner enclosure



H	2155	2155	2155
D	450	600	800

H **Useful height/**external height
D **Useful depth/**external depth

Low voltage distribution boards in flat kit

1 Top/bottom frames
The kit includes the top or bottom frames, with the profiles already mounted in the zamak corner parts. There are 2 versions available, for each of the 9 enclosure dimensions, based on the protection degree IP30 or IP55. Two units of these are required per enclosure.

2 Vertical uprights
4 vertical profiles to complete the frame with the top and bottom frames. One common kit for all the enclosures sizes and IP degrees

3 Base
The base is split in 3 types of kits: the corners, the front cover and the side covers. The front cover depends on the width of the enclosure and the side cover on the depth. When several enclosures are coupled, it's required only to cover each side of the panel, not the intermediate positions. It's possible to assemble one accessory in the internal sides of the panel to assure the distance between the corners. The height of the base is 100 mm, but it can be coupled in vertical to achieve 200 mm in height

4 Top and bottom plates
Top and bottom plates to fix the roof plates with several options as cable entry plates, and the bottom entry plates. They are available in IP30 or IP55 versions.

5 Roof plates
Quixtra 4000 offers different types of cable entry plates to adapt to a wide range of customer needs. Starting with a plain cover till pre punched cable entry plates. Versions in IP30 and IP55. The cable entry plates can be removed to improve the accessibility for the assembly and wiring of the columns.

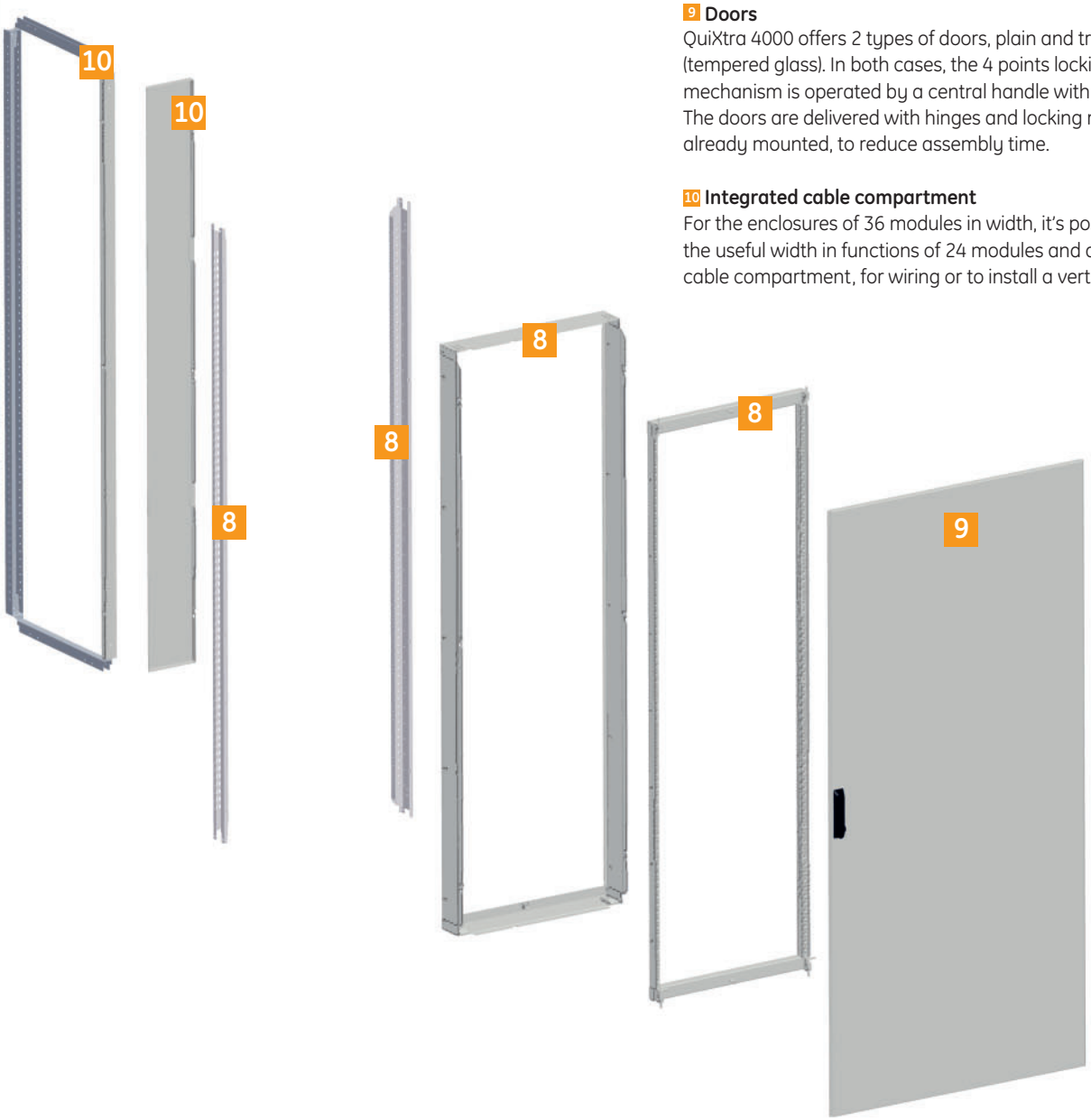
6 Side panels
The kit includes the side panel, right or left side, and all the required fixation screws. There are version IP30 and IP55. Each reference includes just one side panel

7 Back panel
For each width, the IP30 and IP55 versions are available

8 Functional frame
The functional frame, the profiles where are fixed the mounting plates and the DIN-rails for the electrical devices, and the coverplates is to assure the safety of the electrical distribution board. The functional frame depends on the width of the enclosure

9 Doors
QuiXtra 4000 offers 2 types of doors, plain and transparent (tempered glass). In both cases, the 4 points locking mechanism is operated by a central handle with key.
The doors are delivered with hinges and locking mechanism already mounted, to reduce assembly time.

10 Integrated cable compartment
For the enclosures of 36 modules in width, it's possible to split the useful width in functions of 24 modules and an integrated cable compartment, for wiring or to install a vertical busbars.



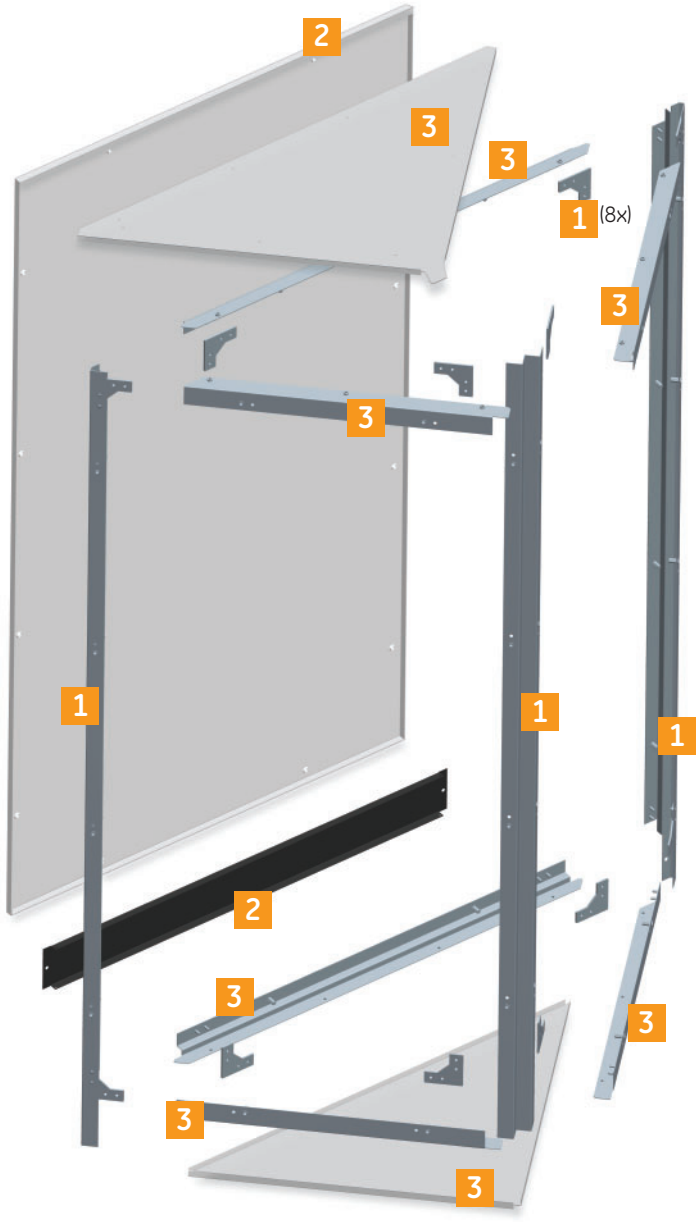
Corner enclosure

To allow the panel layout in L- or U-shape, QuiXtra 4000 offers specific corner enclosures. Each corner enclosure has to be coupled by means of 2 coupling kits 887332.

1 Vertical uprights
Common profiles for all dimensions to allow the coupling to the adjacent enclosures.

2 Back panel and base
Back panel to cover the rear part of the empty enclosure.

3 Horizontal profiles, roof and bottom plates
Profiles to complete the frame of the empty corner enclosure.



Accessories

QuiXtra 4000 offers a wide range of accessories to the panel builder and installer to provide a higher flexibility and to build the distribution board easier and faster.

Mounting plates
QuiXtra 4000 offers partial mounting plates and full height mounting plates, to provide higher flexibility, especially in the Control panels.

Connection kits
The panel builder has the option to order the copper connection bars between the main breaker and the main busbar for some configurations, as well kits for an easy wiring to the main breaker.

Cable entry plates
Wide range of possible cable entry plates, options to fit better the installer needs in each project.

Coupling kits
Kits to couple the enclosures of the same depth side by side and the ones of the same width back to back.

Empty corner enclosure
To allow L and U layouts in the distribution board.

Cover plates
Plain, slotted and recessed cover plates are available.

Main technical characteristics

Useful and external dimensions (mm)

			Useful dimensions			External dimensions		
		Mounting plate width	Width for devices	Depth	Height	Width	Depth	Height
Depth 450	12 mod	238	216 (12 mod)	375	1800	447	450	2155
	24 mod	534	432 (24 mod)	375	1800	743	450	2155
	36 mod	750	648 (36 mod)	375	1800	959	450	2155
Depth 600	12 mod	238	216 (12 mod)	525	1800	447	600	2155
	24 mod	534	432 (24 mod)	525	1800	743	600	2155
	36 mod	750	648 (36 mod)	525	1800	959	600	2155
Depth 800	12 mod	238	216 (12 mod)	725	1800	447	800	2155
	24 mod	534	432 (24 mod)	725	1800	743	800	2155
	36 mod	750	648 (36 mod)	725	1800	959	800	2155

Material and colour

Frame profiles	Sendzimir zinc plated steel 1.5 mm
External panels	Epoxy-polyester coated sheet steel 1.5 mm
Plain door	Epoxy-polyester coated sheet steel 1.5 mm
Transparent door	Epoxy-polyester coated sheet steel 1.5 mm and smoked safety glass 3 mm.
Cover plates	Epoxy-polyester coated sheet steel 1 mm
External plastic	ABS
Internal corners	Die-cast aluminium alloy
Enclosure colour	RAL 9006
Floor base colour	RAL 7024

Protection degree and segregation form

Protection class	I
Pollution degree	3
Segregation	Up to Form 3b
Protection degree	
Without door	IP30, IK08
With plain door and with IP55 panels	IP55, IK09
With plain door and with IP30 panels	IP30, IK09
With transparent door and with IP55 panels	IP55, IK08
With transparent door and with IP30 panels	IP30, IK08

Standards and approvals

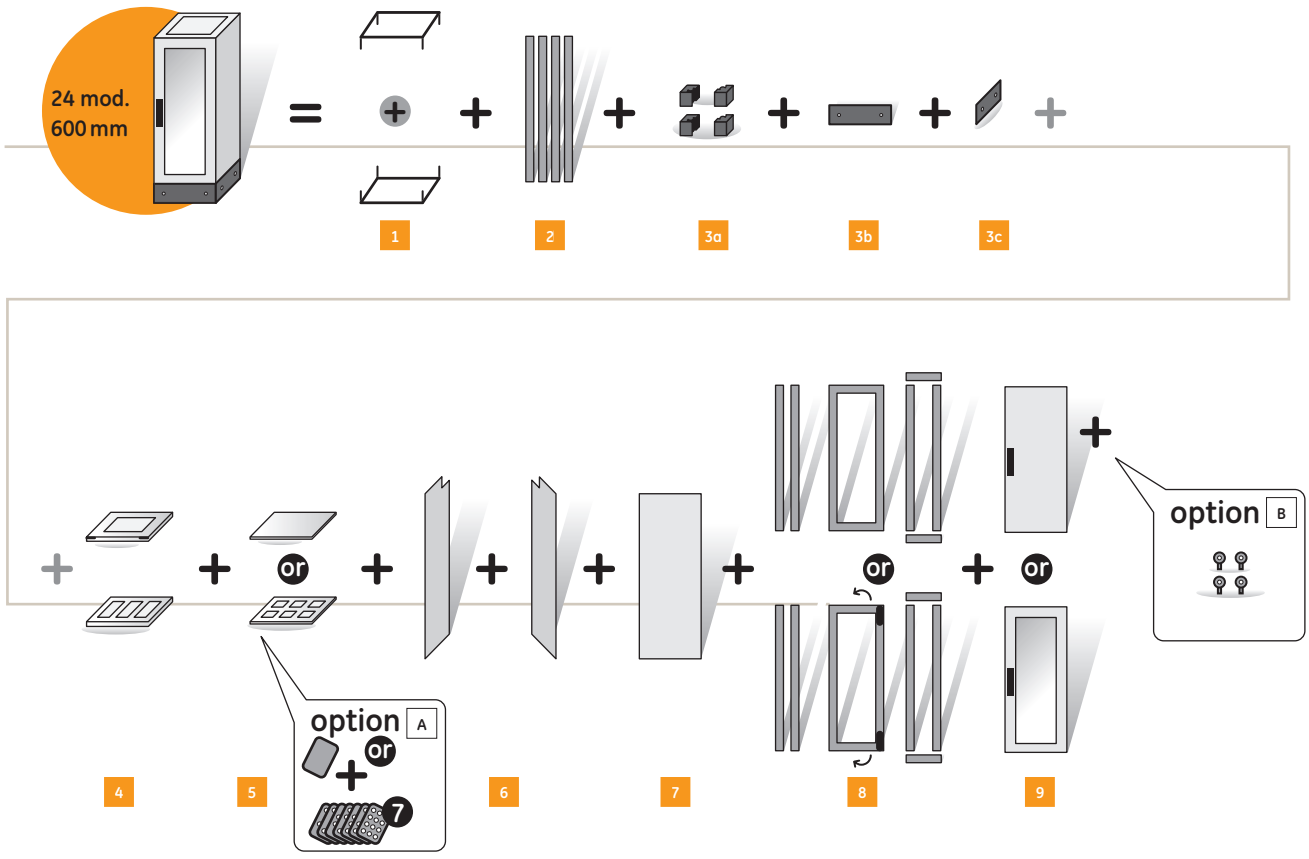
Standards	IEC 61439-2
	EN 61439-2
Approval	**DEKRA** with KEMA quality testreport
Certification	**DEKRA** with KEMA quality testreport
RoHS compliant	YES
REACH compliant	YES

Electrical characteristics

Rated current (In)	4000A
Rated operational voltage (Ue)	415V, 690V
Rated insulation voltage (Ui)	1000V
Rated frequency (fn) 50/60 Hz	50/60Hz
Rated short-circuit current max (Icw)	85kA/1s
Rated current of busbar systems	4000A in IP30

How to order: example 1

Individual 24 modules/600mm enclosure - IP55



1 **887004:** top/bottom frame (2 sets/panel)

2 **887027:** vertical uprights

3a **887064:** base corner (set of 4 pcs)
3b **887062:** base front cover (set of 2 pcs)
3c **887059:** base side cover (set of 2 pcs)

4 **887013:** top/bottom plate

5 **887071:** plain roof plate
or
887080: cutted roof plate
+ option A

6 **887355:** left side panel
and
887053: right side panel

7 **887047:** back panel

8 **887031:** functional frame
or
887034: functional door

9 **887041:** plain door
or
887044: transparent door

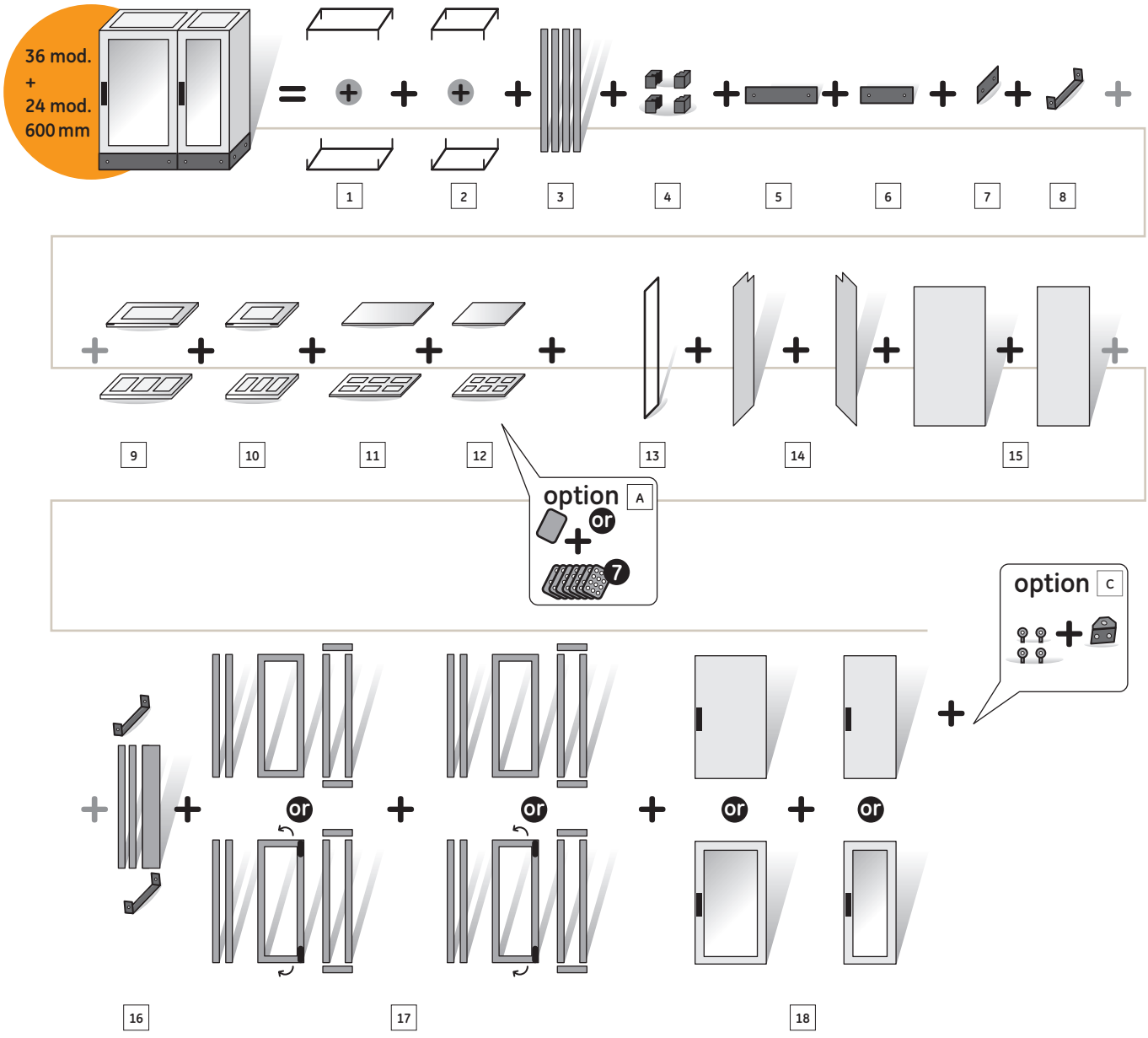
+ option: B

Option A **885228 → 885234:** cable entry plates

Option B **884122:** standard lifting eyes
or
887339: Heavy Duty lifting eyes

How to order: example 2

36 modules with integrated cable compartment (CC) coupled to 24 modules/600 mm enclosure - IP55



1 **887005:** 24 modules + CC top/bottom frame - 600 mm (2 sets/panel)

2 **887004:** 24 modules top/bottom frame - 600 mm (2 sets/panel)

3 **887027:** vertical profiles (2x)

4 **887064:** base/cornerset (2x)

5 **887063:** 24 modules + CC front cover (base)

6 **887062:** 24 modules front cover (base)

7 **887059:** base side cover - 600 mm

8 **887382:** base coupling set

9 **887014:** 24 modules + CC top and bottom plate

10 **887013:** 24 modules top and bottom plate

11 **887072:** plain roof - 24 modules + CC / 600 mm
or
887081: cutted roof 24 modules + CC / 600 mm
+ option A

12 **887071:** 24 modules plain roof - 600 mm
or
887080: cutted roof 600 mm
+ option A

13 **887332:** coupling kit horizontal

14 **887355:** left side panel - 600 mm
and 887053: right side panel - 600 mm

15 **887048 + 887047:** 24 modules + CC and 24 modules backpanel

16 **887038:** integrated cable compartment

17 **887031:** 24 modules functional frame (2x)
or
887034: 24 modules functional door (2x)

18 **887042 + 887041:** plain door 24 mod. + CC and 24 mod.
or
887045 + 887044: transparent door 24 mod. + CC and 24 mod.

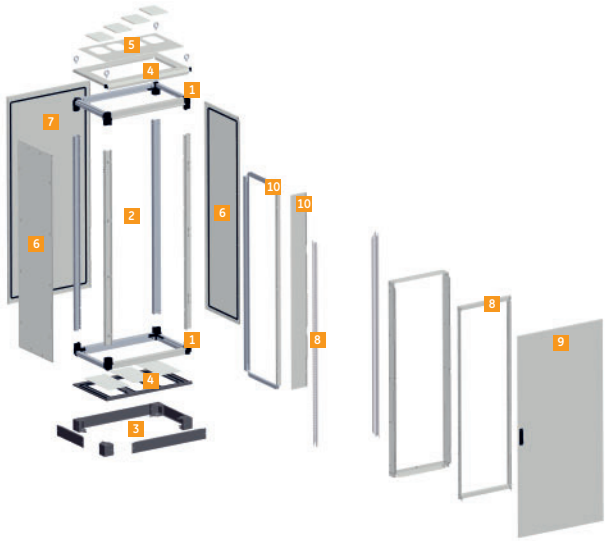
+ option: C

option A **885228 → 885234:** cable entry plates

option C **884122:** standard lifting eyes
or
887339: Heavy Duty lifting eyes
and
887331: lifting brackets for coupled enclosures

Enclosure kits

The QuiXtra 4000 enclosures can be offered with the protection degrees IP30 or IP55. The configuration IP30 requires different order codes in top and bottom frames, side panels and rear panels. Additionally, in the configuration IP55, if the door is not assembled, the protection degree drops to IP30.
The order codes for each configuration are defined in the table below, depending on the enclosure depth.



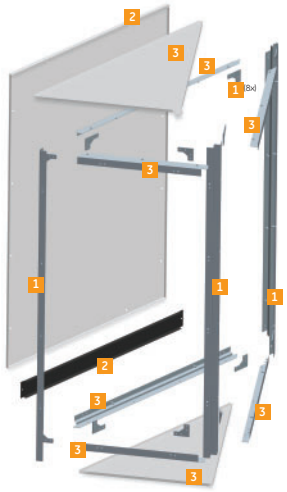
Enclosure basic kits

			Ref. No.				Ref. No.			
IP degree			**IP55**				**IP30**			
		Width (mod.)	**12**	**24**	**36**	**24 + CC[1]**	**12**	**32**	**36**	**24 + CC[1]**
		Depth (mm)[2]								
1 Top/bottom frames *(2 sets/panel)*		450	887000	887001	887002	887002	887364	887365	887366	887366
		600	887003	887004	887005	887005	887367	887368	887369	887369
		800	887006	887007	887008	887008	887370	887371	887372	887372
2 Vertical uprights			887027	887027	887027	887027	887027	887027	887027	887027
3 Base 100 mm	Corner		887064	887064	887064	887064	887064	887064	887064	887064
	Front cover		887061	887062	887063	887063	887061	887062	887063	887063
	Side cover	450	887058	887058	887058	887058	887058	887058	887058	887058
		600	887059	887059	887059	887059	887059	887059	887059	887059
		800	887060	887060	887060	887060	887060	887060	887060	887060
4 Top and bottom plates		450	887009	887010	887011	887011	887018	887019	887020	887020
		600	887012	887013	887014	887014	887021	887022	887023	887023
		800	887015	887016	887017	887017	887024	887025	887026	887026
5 Roof plates	Plain	450	887067	887068	887069	887069	887085	887086	887087	887087
		600	887070	887071	887072	887072	887088	887089	887090	887090
		800	887073	887074	887075	887075	887091	887092	887093	887093
	Cutted	450	887076	887077	887078	887078	887094	887095	887096	887096
		600	887079	887080	887081	887081	887097	887098	887099	887099
		800	887082	887083	887084	887084	887100	887101	887102	887102
	Ventilated	450	-	-	-	-	887103	887104	887105	887105
		600	-	-	-	-	887106	887107	887108	887108
		800	-	-	-	-	887109	887110	887111	887111
6 Side panels	Right	450	887052	887052	887052	887052	887055	887055	887055	887055
		600	887053	887053	887053	887053	887056	887056	887056	887056
		800	887054	887054	887054	887054	887057	887057	887057	887057
	Left	450	887354	887354	887354	887354	887357	887357	887357	887357
		600	887355	887355	887355	887355	887358	887358	887358	887358
		800	887356	887356	887356	887356	887359	887359	887359	887359
7 Back panel			887046	887047	887048	887048	887049	887050	887051	887051
8 Functional frame			887030	887031	887032	887028	887030	887031	887032	887028
Functional door			887033	887034	887035	887029	887033	887034	887035	887029
9 Door	Plain		887040	887041	887042	887042	887040	887041	887042	887042
	Transparent		-	887044	887045	887045	-	887044	887045	887045
Coupling kit	Horizontal		887332	887332	887332	887332	887332	887332	887332	887332
	Back to back		887333	887333	887333	887333	887333	887333	887333	887333
10 Integrated cable compartment *(left or right)*		450	-	-	-	887037	-	-	-	887037
		600	-	-	-	887038	-	-	-	887038
		800	-	-	-	887039	-	-	-	887039

(1) CC stands for Cable Compartment
(2) Depth 450 mm: designed for MCCB Record Plus FK incomer
Depth 600 mm: designed for ACB EntelliGuard and M-PACT Plus frame 1 incomer
Depth 800 mm: designed for ACB EntelliGuard and M-PACT Plus frame 2 incomer

Corner enclosure kits

To allow the panel layout in L- or U-shape, QuiXtra 4000 offers specific corner enclosures.
Each corner enclosure has to be coupled by means of two coupling kits 887332.

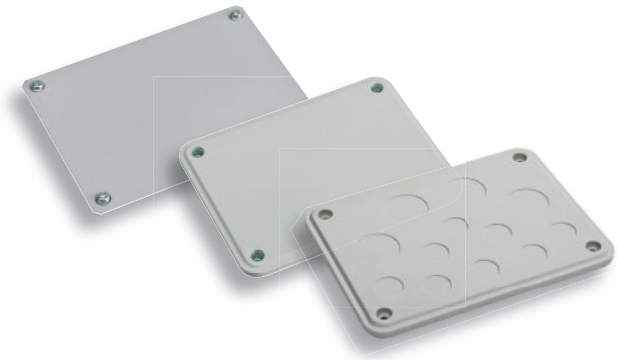


Corner enclosure kits

	Ref. No.	Ref. No.	Ref. No.
IP degree		**IP30**	
Depth (mm)	**450**	**600**	**800**
1 Vertical uprights (common profiles)	887363	887363	887363
2 Back panel and base	887360	887361	887362
3 Horizontal profiles, roof and bottom plates	887349	887350	887351

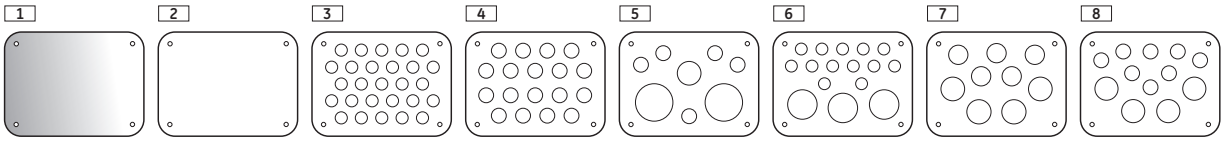
Cable entry plates

QuiXtra 4000 offers a wide range of cable entry plates as options, to allow the adaptation to different installations needs. Table with the different cable entry plate possibilities, and the number of each one per type of enclosure:



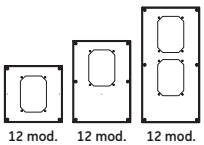
Cable entry plates types

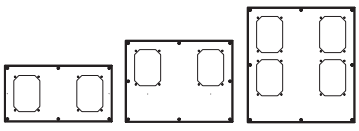
Range	IP protection	Ref. No.
1 Plain metal (RAL 9006)	IP40	**885287**
2 Plain polyester (RAL 7035)	IP55	**885228**
3 Polyester 27xM20		**885229**
4 Polyester 18xM25		**885230**
5 Polyester 2xM63 + 1xM40 + 5xM25		**885231**
6 Polyester 3xM50 + 13xM20		**885232**
7 Polyester 4xM40 + 5xM32		**885233**
8 Polyester 4xM40 + 8xM25		**885234**

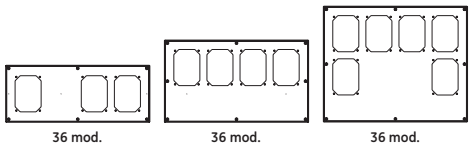


Number of cable entry plates in cutted roof plates

Depth (mm)	12 modules	24 modules	36 modules
450	1	2	3
600	1	2	4
800	2	4	6







Functional units for modular devices

Content
- DIN-rail
- Supports to fix to the functional frame
- Coverplate with cut-out
- Blanking plate
- Fixation elements

Modular devices

	Height (mm)	Ref. No. 12 modules	Ref. No. 24 modules	Ref. No. 36 modules
DIN-rail for modular devices	150	**887148**	**887149**	**887150**
DIN-rail for modular devices	200	**887151**	**887152**	**887153**
DIN-rail for modular Fixwell devices	150	**887154**	**887155**	**887156**

Functional units for terminals

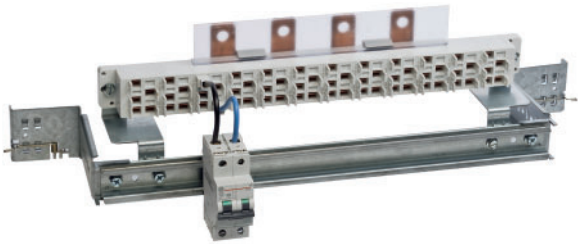
Content
- DIN-rail
- Supports to fix to the functional frame
- Coverplate with cut-out
- Plain blanking plate
- Fixation elements

Terminals

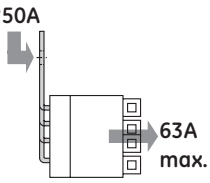
	Height (mm)	Ref. No. 12 modules	Ref. No. 24 modules	Ref. No. 36 modules
1 horizontal DIN-rail for terminals	150	**887142**	**887143**	**887144**
1 vertical DIN-rail for terminals	900	**887145**	-	-
3-4 vertical DIN-rails for terminals	300	-	**887146**	**887147**
Earth bar	-	**885264**	**885138**	**885138**

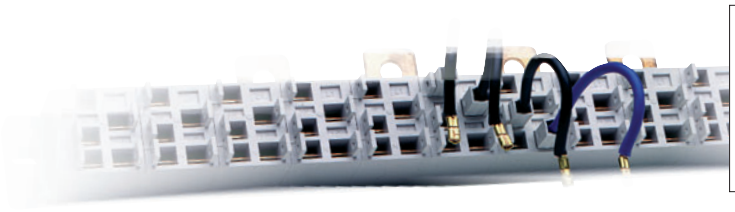
Moduclic plug-in distribution system

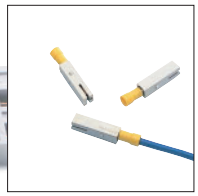
Moduclic is a secondary plug-in distribution system of 250A, 660V~ 60kA peak. Moduclic is a busbar for modular devices and this as well for MCBs as for comfort functions. Moduclic is mounted directly on the DIN-rail and is **independent** of the type of **system enclosure**: Quixtra or VP-System.
The main advantage of Moduclic is the **safety** aspect (IP20): adding or **removing** electrical circuits in a panel board **without disconnecting** the power. All outgoing circuits stay in the operational function, due to the fact that all operations are done using the **insulated click connection**, without touching the life parts, not even when using an insulated tool.
Standard connections of 6 mm² (up to 40A) are shipped with Moduclic. The Moduclic distribution system is suitable for integration in **all system enclosures** conform to **IEC 61439-2**

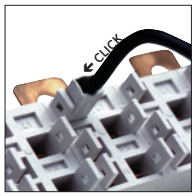


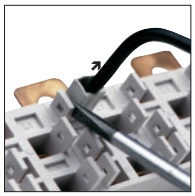
24 and 36 modules - 3P+2N - IP20









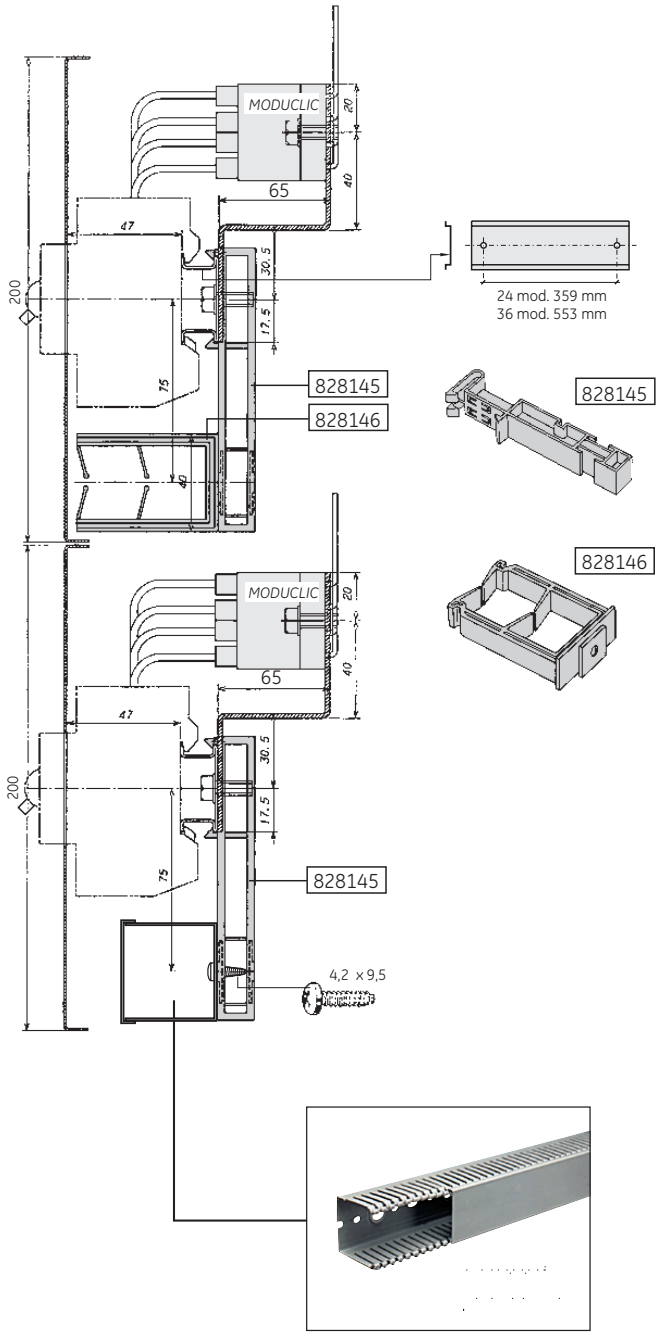


Moduclic distribution system

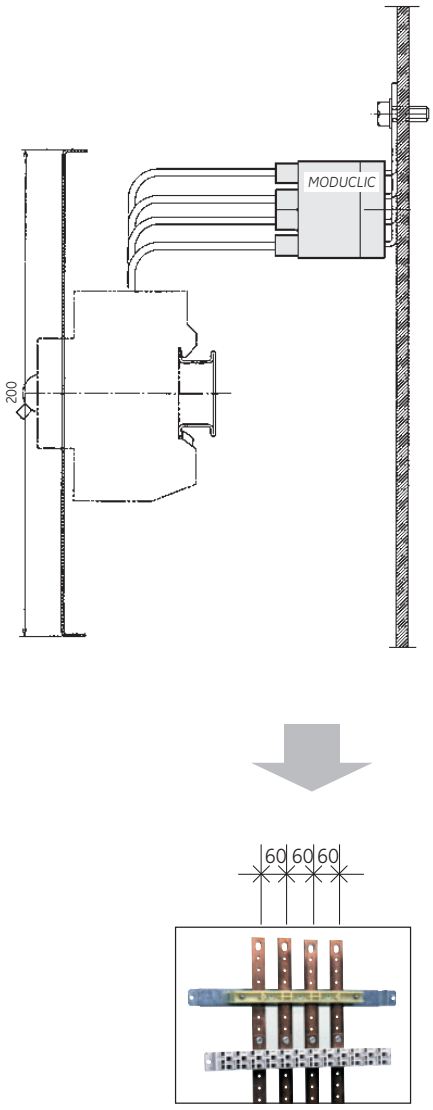
Description	Cables	Cable section (mm²)	Cable length (mm)	Ref. No.	Pack
Moduclic 24 modules 3P+2N + cables 3P+N				**880884**	1
	18 black cables	6	120		
	6 blue cables	6	120		
Moduclic 24 modules 3P+2N + cables mono				**880885**	1
	12 black cables	6	120		
	12 blue cables	6	120		
Moduclic 24 modules 3P+2N without cables		-	-	**880886**	1
Moduclic 36 modules 3P+2N + cable 3P+N				**885265**	1
	27 black cables	6	120		
	9 blue cables	6	120		
Moduclic 36 modules 3P+2N + cables mono				**885266**	1
	18 black cables	6	120		
	18 blue cables	6	120		
Moduclic 36 modules 3P+2N without cables		-	-	**885267**	1
Cables with end connector					
	6 black cables	6	120	**880887**	1
	6 blue cables	6	120	**880888**	1
	6 black cables	10	120	**880889**	1
	6 blue cables	10	120	**880890**	1
Stripped cables					
	6 black cables	6	320	**880891**	1
	6 blue cables	6	320	**880892**	1
	6 black cables	10	320	**880893**	1
	6 blue cables	10	320	**880894**	1
Cables for 2 x 4P MCBs - 6 black and 2 blue					
	8 cables	6	120	**880926**	1
	8 cables	10	120	**880928**	1
	8 cables	6	320	**880930**	1
	8 cables	10	320	**880932**	1
Cables for 4 x 2P MCBs - 4 black and 4 blue					
	8 cables	6	120	**880927**	1
	8 cables	10	120	**880929**	1
	8 cables	6	320	**880931**	1
	8 cables	10	320	**880933**	1
Plugs					
	1.5-2.5 mm² blue, 10 plugs			**880895**	1
	4-6 mm² yellow, 10 plugs			**880896**	1

Mounting of Moduclic

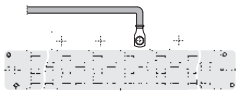
On DIN-rail (step = 200 mm)



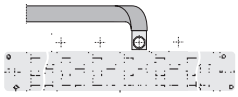
Directly on busbar (step = 200 mm)



Incoming connections



Cable max. 70 mm² - 170A



Flexibar 3 x 20 x 1 - 250A

Functional units for MCCBs – Record Plus - Fixed

Content
- Mounting plate
- Supports to fix to the functional frame
- Coverplate with cut-out
- Fixation elements

Example: horizontal assembly

MCCBs - Record Plus - Manual operation - Toggle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.	# MCCBs	Ref. No.
Horizontal assembly					24 modules		36 modules	
FD	160	3/4		150	1	887157	1	887158
FD+RCD	160	3	Bottom	150	1	887279	1	887166
FD+RCD	160	4	Bottom	150	1	887159	1	887162
FE	250	3/4		200	1	887168	1	887169
FE+RCD	250	3/4	Bottom	200	1	887173	1	887174
FG	630	3		300	1	887183	1	887185
FG	630	4		300	1	887184	1	887186
FG+RCD	630	3	Bottom	300	1	887191	1	887193
FG+RCD	630	4	Bottom	300	1	887192	1	887194
FK	1600	3/4		450	1	887205		
Vertical assembly								
FD	160	3/4		250	4	887160	6	887163
FD	160	3		250	5	887161		
FD+RCD	160	3/4	Side	250	2	887160	3	887163
FE	250	3/4		450	3	887170		
FE	250	3		450	4	887171		
FE	250	3/4		450			4	887172
FE+RCD	250	3/4	Bottom	600	3	887175	4	887176
FG	630	3		600	1	887187	1	887189
FG	630	4		600	1	887188	1	887190
FG+RCD	630	3	Bottom	600	1	887195	1	887197
FG+RCD	630	4	Bottom	600	1	887196	1	887198
FK	1600	3/4		600	1	887206	1	887207

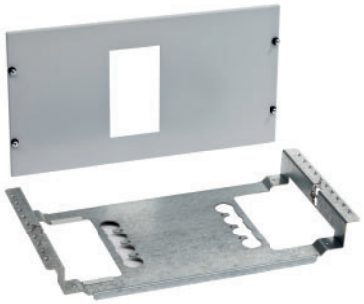
MCCBs - Record Plus - Manual operation - Rotary handle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
Horizontal assembly					24 modules	
FD	160	3/4		150	1	887167
FD+RCD	160	3/4	Bottom	150	1	887167
FE	250	3/4		200	1	887181
FE+RCD	250	3/4	Bottom	200	1	887181
FG	630	3/4		300	1	887203
FG+RCD	630	3/4	Bottom	300	1	887203
FK	1600	3/4		450	1	887208

MCCBs - Record Plus - Motor operation

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
Horizontal assembly					24 modules	
FD	160	3/4		150	1	887167
FD+RCD	160	3/4	Bottom	150	1	887167
FE	250	3/4		200	1	887182
FE+RCD	250	3/4	Bottom	200	1	887182
FG	630	3/4		300	1	887204
FG+RCD	630	3/4	Bottom	300	1	887204
FK	1600	3/4		450	1	887209

Functional units for MCCBs – Record Plus – Plug-in



Content
- Mounting plate
- Supports to fix to the functional frame
- Coverplate with cut-out
- Fixation elements

MCCBs - Record Plus - Plug in - Manual operation - Toggle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
Horizontal assembly					24 modules	
FD	160	3/4		150	1	887164
FE	250	3/4		200	1	887177
FE+RDC	250	3/4	Bottom	200	1	887178
FG	630	3		300	1	887199
FG	630	4		300	1	887200

MCCBs - Record Plus - Plug in - Rotary handle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
Horizontal assembly					24 modules	
FD	160	3/4		150	1	887165
FE	250	3/4		200	1	887179
FG	630	3/4		300	1	887201

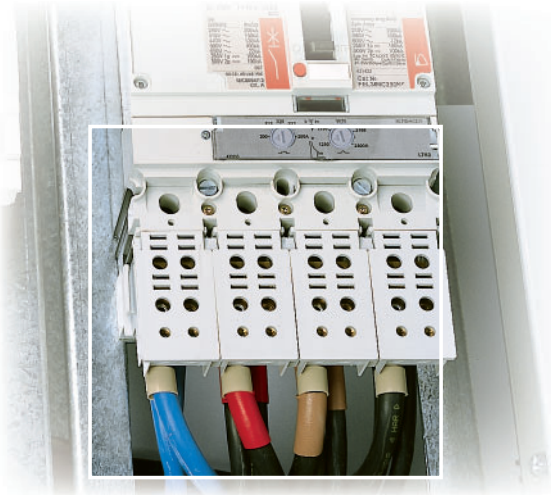
MCCBs - Record Plus - Plug in - Motor operation(1)

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
Horizontal assembly					24 modules	
FD	160	3/4		150	1	887165
FE	250	3/4		200	1	887180
FG	630	3/4		300	1	887202

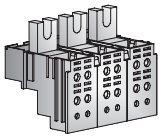
(1) To check the minimum required depth of the enclosure, please consult PowerDesign.

Distribution terminals for Record Plus

Especially designed to allow the use of the moulded case circuit breaker Record Plus FE frame as a mains device with cables distributing the load over multiple outgoing circuits (or lines of multiple outgoing circuits).
The terminals are available as a three or four pole set allowing the line or load side of the breaker to be equipped.
The sets consist of a number of fully insulated single pole units that can be assembled into a multipole distribution block before they are mounted on the breaker.



External connectors
Connector 6 copper cable cores 2.5 mm² up to 35 mm²
Set for equipping the line or load side of a breaker



Frame size	Conductors	Size of conductors	Strippable length	Max. torque on lug bolt
FE160/250	max. 6	4 x 2.5 - 35 mm²	12 mm	6 Nm
	-	2 x 2.5 - 16 mm²	12 mm	3 Nm

External connectors

	Ref. No.	Pack
Set 3 pole	880954	1
Set 4 pole	880955	1

Functional units for MCCBs – Record Plus - Withdrawable

Content

- Mounting plate
- Supports to fix to the functional frame
- Coverplate with cut-out
- Fixation elements

MCCBs - Record Plus - Withdrawable - Toggle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
VERTICAL ASSEMBLY						
					24 modules	
FK	1600	3/4		600	1	887210(1)

MCCBs - Record Plus - Withdrawable - Rotary handle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
VERTICAL ASSEMBLY						
					24 modules	
FK	1600	3/4		600	1	887211(1)

MCCBs - Record Plus - Withdrawable - Motor operation

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
VERTICAL ASSEMBLY						
					24 modules	
FK	1600	3/4		600	1	887212(1)

(1) Two depth profile sets required:
600 mm: 887329
800 mm: 887330.
(min. depth 600 mm).

Functional units for MCCBs – Record Plus – Changeover

Content

- Mounting plate
- Supports to fix to the functional frame
- Coverplate with cut-out
- Fixation elements

Automatic changeover - Record Plus - Rotary handle

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
HORIZONTAL ASSEMBLY						
					24 modules	
FE-FE	250/250	3	-	600	2	887213
FE-FE	250/250	4	-	600	2	887218
FG/FE	630/250	3	-	600	2	887215
FG/FE	630/250	4	-	600	2	887219
FG/FG	630/630	3/4	-	600	2	887214
FK/FG	1600/630	3/4	-	600	2	887217
FK/FK	1600/1600	3/4	-	600	2	887216

Automatic changeover - Record Plus - Motor operation[1]

Record Plus frame size	In (A)	Poles	RCD position	Heigth (mm)	# MCCBs	Ref. No.
HORIZONTAL ASSEMBLY						
					24 modules	
FE-FE	250/250	3/4	-	600	2	887220
FG/FE	630/250	3	-	600	2	887222
FG/FE	630/250	4	-	600	2	887225
FG/FG	630/630	3/4	-	600	2	887221
FK/FG	1600/630	3/4	-	600	2	887224
FK/FK	1600/1600	3/4	-	600	2	887223
Functional unit for automatic controller			-	250		887226

(1) To check the minimum required depth of the enclosure, please consult PowerDesign.

Functional units for LBSs – Dilos / Fulos

Content
- Mounting plate
- Supports to fix to the functional frame
- Coverplate with cut-out
- Fixation elements

Loadbreak disconnectors

Dilos size	In (A)	Poles	Heigth (mm)	# LBSs	Ref. No.
				24 modules	
HORIZONTAL ASSEMBLY					
Dilos 3	160-315	3/4	300	1	887229
Dilos 4	400-630	3/4	450	1	887231(1)
Dilos 6S 35 kA	800-1250	3/4	600	1	887233(1)
Dilos 6S 50 kA	800-1250	3/4	700	1	887235(1)
VERTICAL ASSEMBLY					
Dilos 1-2	40-200	3/4	200	1	887227
Dilos 1H	40-200	3/4	300	1	887228
Dilos 3	160-315	3/4	300	1	887230
Dilos 4	400-630	3/4	600	1	887232(1)
Dilos 6S 35 kA	800-1250	3/4	450	1	887234(1)
Dilos 6S 50 kA	800-1250	3/4	600	1	887236(1)

Fused loadbreak disconnectors

Fulos size	In (A)	Poles	Heigth (mm)	# LBSs	Ref. No.
				24 modules	
HORIZONTAL ASSEMBLY					
Fulos 1-2	250-400	3/4	400	1	887238(1)
Fulos 3S	630	3/4	600	1	887233(1)
VERTICAL ASSEMBLY					
Fulos 0/00/000	32-160	3/4	250	1	887237
Fulos 3S	630	3/4	450	1	887234(1)

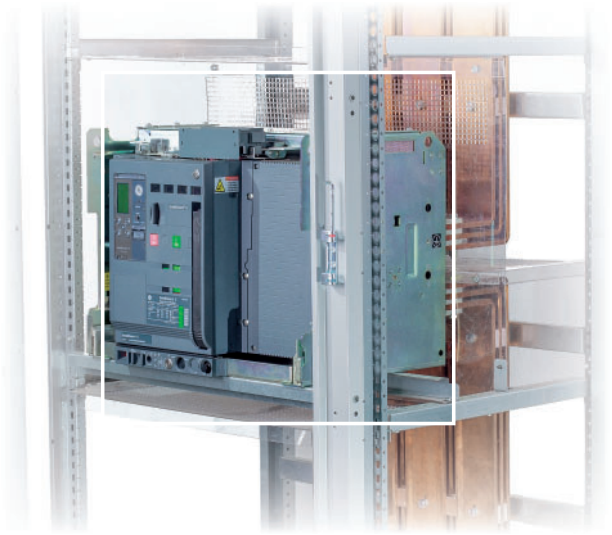
Functional units for insulated fuse Cosmo

Cosmos type	In (A)	Poles	Heigth (mm)	# LBSs	Ref. No.
				24 modules	
VERTICAL ASSEMBLY					
D01/D1/D2			300	1	887239

(1) Two depth profile sets required:
600 mm: 887329
800 mm: 887330.
(min. depth 600 mm).

Functional units for ACBs – EntelliGuard™ / M-PACT Plus

Content
- Support profiles to fix to the depth profiles
- Coverplate with cut-out
- Fixation elements



Functional units for ACB EntelliGuard™

ACB frame	In (A)	Poles	Heigth (mm)	# ACBs	Ref. No.	# ACBs	Ref. No.
VERTICAL ASSEMBLY							
				24 modules		36 modules	
Frame 1	Fixed	3/4	700	1	**887240**[1]		
Frame 1	Withdrawable	3/4	700	1	**887241**[2]		
Frame 1/2	Fixed	3/4	700			1	**887242**[1]
Frame 1/2	Withdrawable	3/4	700			1	**887243**[2]

Functional units for ACB M-PACT Plus

ACB frame	In (A)	Poles	Heigth (mm)	# ACBs	Ref. No.	# ACBs	Ref. No.
VERTICAL ASSEMBLY							
				24 modules		36 modules	
Frame 1	Fixed	3/4	700	1	**887244**[1]		
Frame 1	Withdrawable	3/4	700	1	**887245**[2]		
Frame 1/2	Fixed	3/4	700			1	**887246**[1]
Frame 1/2	Withdrawable	3/4	700			1	**887247**[2]

(1) One depth profile set required.
600 mm: 887329.
800 mm: 887330
(2) Withdrawable only for 800 mm. One depth profile set required: 887330
Form 2 and 3: extra set depth profiles needed.

Note: enclosures 600 mm depth only allow ACB Frame 1 fixed

Mounting plates

QuiXtra 4000 offers the possibility of using partial mounting plates in combination with the rest of functions, or the full height mounting plate, adjustable in depth. Partial mounting plates require 2 sets of depth profiles. Full heigth mounting plate requires 3 sets of depth profiles.

Heigth (mm)	WIDTH		
	12 modules	24 modules	36 modules
200	887112	887117	887122
400	887113	887118	887123
600	887114	887119	887124
1800	887115	887120	887125
200 perforated	887116	887121	887126

Cover plates

Heigth (mm)	Type	WIDTH		
		12 modules	24 modules	36 modules
50	Plain	885166	885167	885168
100	Plain	887127	887132	887137
150	Plain	885169	885170	885171
200	Plain	885172	885173	885174
250	Plain	887128	887133	887138
300	Plain	885175	885176	885177
400	Plain	887129	887134	887139
600	Plain	885161	887135	887140
750	Plain	885162	-	-
900	Plain	885163	-	-
1050	Plain	885164	-	-
1200	Plain	885165	-	-
150	Slot modular devices	885178	885179	885180
150	Push-buttons	-	885189	885190
150	Meters 72x72	-	885185(1)	885186(2)
150	Meters 96x96	-	885187(3)	885188(4)
150	Recessed and pre-punched side	-	885181	885182
200	Ventilated	887131	887136	887141
300	Recessed and pre-punched side	887130	885183	885184

(1) 4 meters
(2) 6 meters
(3) 3 meters
(4) 5 meters

Separation screens Form 2 and Form 3

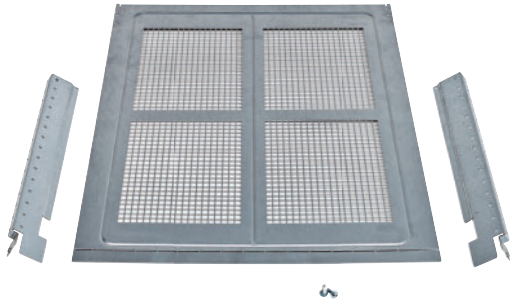
QuiXtra 4000 can be upgraded to internal segregation Form 2 or Form 3. To achieve the segregation Form 2 is required to add the separation screen for the busbars. To achieve the Form 3 additionally is required to add the separation screen between functions. There are special separation screen for the ACBs.

Form 2/3 separation screens

Depth (mm)			
Horizontal separation (metal)	WIDTH		
	12 modules	24 modules	36 modules
450	887257	887260	887263
600	887258	887261	887264
800	887259	887262	887265

Side separation (length 900 mm) (polycarbonate)			
	without CC	with CC	
450	887266	887280	-
600	887267	887281	-
800	887268	887282	-

Vertical rear busbar separation (length 900 mm) (polycarbonate)			
	12 modules	24 modules	36 modules
450/600/800	-	887270	887270

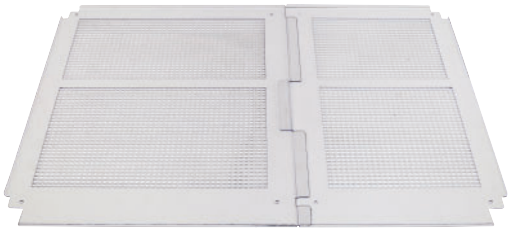


ACB EntelliGuard™

Description	Type	WIDTH	
		24 modules	36 modules
EntelliGuard Frame 1	Fixed	887271	887273
EntelliGuard Frame 1	Withdrawable	887272	887274
EntelliGuard Frame 2	Fixed	-	887273
EntelliGuard Frame 2	Withdrawable	-	887274

ACB M-PACT Plus

Description	Type	WIDTH	
		24 modules	36 modules
M-PACT Plus Frame 1	Fixed	887275	887277
M-PACT Plus Frame 1	Withdrawable	887276	887278
M-PACT Plus Frame 2	Fixed	-	887277
M-PACT Plus Frame 2	Withdrawable	-	887278



Busbars overview

In a QuiXtra 4000, busbars can be fixed horizontally and/or vertically

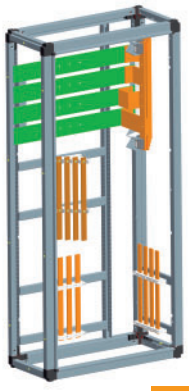
Maximum I_n (A) for busbars if ambient temperature is 35°C

Fixation	Position	Enclosure Depth (mm)	IP30 without door				IP55			
			12 mod.	24 mod.	36 mod.	36 mod. with integr. cable compartment	12 mod.	24 mod.	36 mod.	36 mod. with integr. cable compartment
HORIZONTAL										
Side	flat	**600**	2000	2000	2000	2000	2000	2000	2000	2000
		800	4000	4000	4000	4000	4000	4000	4000	4000
Rear		**450**	1600	1600	1600	1600	1600	1600	1600	1600
		600	1600	1600	1600	1600	1600	1600	1600	1600
		800	1600	1600	1600	1600	1600	1600	1600	1600
VERTICAL										
Side	flat	**450**	670	-	-	670	440	-	-	440
		600	670/2000	-	-	670/2000	440/2000	-	-	440/2000
		800	670/4000	-	-	670/2500	440/4000	-	-	440/2500
	staircase	**450**	-	-	-	1600	-	-	-	1600
		600	630	-	-	630	440	-	-	440
		800	630	-	-	630	440	-	-	440
Rear	flat	**450**	670/1600	630/1600	630/1600	670/1600	440/1600	440/1600	440/1600	440/1600
		600	670/2000	630/2000	630/2000	670/2000	440/2000	440/2000	440/2000	440/2000
		800	670/2000	630/2000	630/2000	670/2000	440/2000	440/2000	440/2000	440/2000
	staircase	**450**	630	630	630	630	440	440	440	440
		600	630	630	630	630	440	440	440	440
		800	630	630	630	630	440	440	440	440

Horizontal busbars

Depending on where the busbar supports are fixed, QuiXtra 4000 offers 2 kinds of horizontal busbars, both with flat positioned bars.

- **Side fixation:** busbar supports are fixed on the side profiles and the phases are positioned one behind the other. For 36 modules width enclosures you can use floating supports in the middle. These busbars can be placed in 600 mm or 800 mm deep enclosures and are put on top or in the middle of the enclosure.
- **Rear fixation:** busbar supports are fixed on the back profiles and the phases are positioned one below the other. This is the only horizontal position possible for 450 mm deep enclosures.



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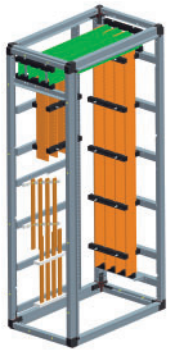


2

Maximum I_n (A) at IP30[(1)] without door if ambient temperature is 35°C

Enclosure depth (mm)		450	600	600	800	800
Busbar support fixation		Rear	Side	Rear	Side	Rear
Busbar position		Flat	Flat	Flat	Flat	flat
Figure number		1	2	1	2	1
Max I_n (A) at IP30 without door[(1)]		1600	2000	1600	4000	1600
Distance between busbars (mm)		125	90	125	90	125
Enclosure width (mod.)		all	all	all	all	all
Cross section	50x10		1100A		1100A	
	60x10	1000A	1300A	1000A	1300A	1000A
	80x10	1250A	1400A	1250A	1400A	1250A
	100x10	1600A	2000A	1600A	2000A	1600A
	120x10				2400A	
	160x10				2700A	
	(80x10) x2				2500A	
	(100x10) x2				3000A	
	(120x10) x2				3600A	
	(160x10) x2				4000A	

(1) Check table page C.6 for derating

Vertical busbars

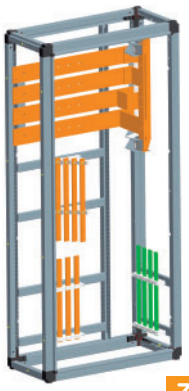
Depending on where the busbar supports are fixed, QuiXtra 4000 offers 2 different fixations for vertical busbars.

- **Side fixation:** busbar supports are fixed on the side of the enclosure and the phases are positioned one behind the other. These busbars can be placed in 600 mm or 800 mm deep enclosures of 12 modules width. We offer these busbars up to 4000A. Copper can be flat or staircase.
- **Rear fixation:** busbars supports are fixed on the back uprights of the enclosure and the position of the phases is one next to another. We have 2 sizes: up to 630A and up to 2000A. Copper can be flat or staircase.

Maximum I_n (A) at IP30[1] without door if ambient temperature is 35°C

Enclosure depth (mm)		450	450	450	450	600	600	600	600	800	800	800	800
Busbar support fixation		Side	Side	Rear	Rear	Side	Rear	Rear	Rear	Side	Rear	Rear	Rear
Busbar position		flat	staircase	flat	staircase	flat	flat	flat	staircase	flat	flat	flat	staircase
Figure number		3	4	5	6	7	8	9	10	7	8	9	10
Max In (A) at IP30 without door[1]		670	1600	670	630	2000	2000	670	630	4000	2000	670	630
Distance between busbars (mm)		60	-	60	35	90	125	60	35	90	125	60	35
Enclosure width (mod.)		all	36CC	all	all	12/36CC	24/36/36CC	all	all	12/36CC	24/36/36CC	all	all
Cross section	20x5	275A	-	275A	250A	-	-	275A	250A	-	-	275A	250A
	30x5	425A	-	425A	400A	-	-	425A	400A	-	-	425A	400A
	20x10	425A	-	425A	400A	-	-	425A	400A	-	-	425A	400A
	30x10	670A	670A	670A	630A	-	-	670A	630A	-	-	670A	630A
	40x10	-	800A	-	-	-	-	-	-	-	-	-	-
	50x10	-	1000A	-	-	1100A	1000A	-	-	1100A	1000A	-	-
	60x10	-	-	-	-	1300A	1250A	-	-	1300A	1250A	-	-
	80x10	-	-	-	-	1650A	1600A	-	-	1650A	1600A	-	-
	100x10	-	-	-	-	2000A	2000A[2]	-	-	2000A	2000A	-	-
	(30x10) x2	-	800A	-	-	-	-	-	-		-	-	-
	(40x10) x2	-	1250A	-	-	-	-	-	-		-	-	-
	(50x10) x2	-	1600A	-	-	-	-	-	-	2000A	-	-	-
	(80x10) x2	-	-	-	-	-	-	-	-	2500A	-	-	-
	(100x10) x2	-	-	-	-	-	-	-	-	3000A	-	-	-
	(120x10) x2	-	-	-	-	-	-	-	-	3600A	-	-	-
	(160x10) x2	-	-	-	-	-	-	-	-	4000A	-	-	-

(1) Check table page C.6 for derating
(2) Not all functions can be put in front a 2000A busbar, please check with PowerDesign 2.0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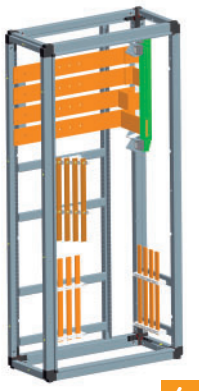
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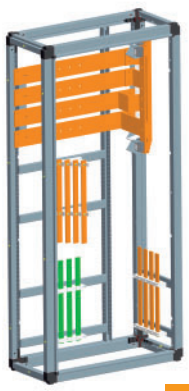
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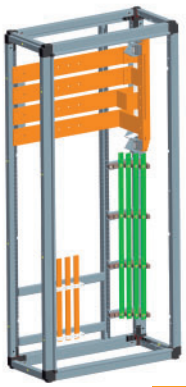
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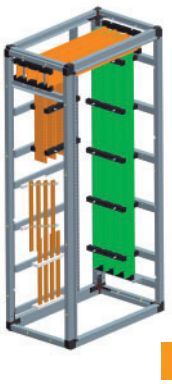
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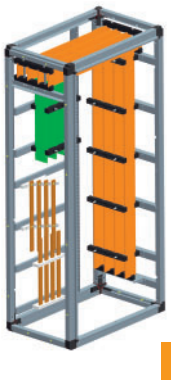
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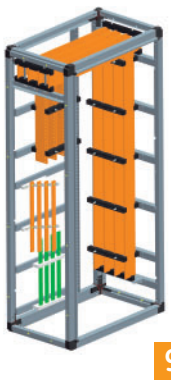
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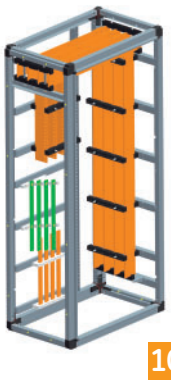

10

Example of a connectivity kit for ACB to busbar

Example of connecting a vertical busbar with side fixation to a horizontal busbar with side fixation.

Copper bars

Cu size	Plain		Threaded			Pre-punched for vertical busbars	Pre-punched for horizontal busbars 450/600 and 800		
mm	3 m	2 m	2 m	4x1 m	holes	1.75 m	12 mod.	24 mod.	36 mod.
20x5	858036	-	885207	880847	M6	-	-	-	-
30x5	885204	-	885209	-	M6	-	-	-	-
20x10	885205	-	885208	-	M6	-	-	-	-
30x10	885206	-	885210	880851	M8	887398	-	-	-
40x10	-	-	-	-	-	887429	-	-	-
50x10	-	887306	-	-	-	887300	887425/887399	887422/887405	887419/887411
60x10	-	887307	-	-	-	887301	887426/887400	887423/887406	887420/887412
80x10	-	887308	-	-	-	887302	887427/887401	887424/887407	887421/887413
100x10	-	887309	-	-	-	887303	-/887402	-/887408	-/887414
120x10	-	887310	-	-	-	887304	-/887403	-/887409	-/887415
160x10	-	887311	-	-	-	887305	-/887404	-/887410	-/887416

Flexible copper - Length = 2m

6x13x0.5 - 125A	2x20x1 - 160A	3x20x1 - 250A	4x32x1 - 400A	6x32x1 - 630A	10x32x1 -800A
886530	886532	828162	828163	828164	828165

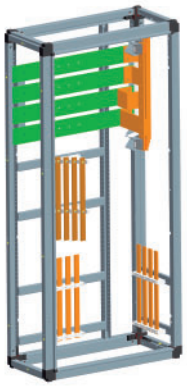
Earth bars

The earth continuity is assured with horizontal and vertical copper bars. The use of standard copper bars is required.

Earth bars

	Ref. No.
Universal brackets for earth bars	887347

Horizontal busbars for 450 mm deep enclosures

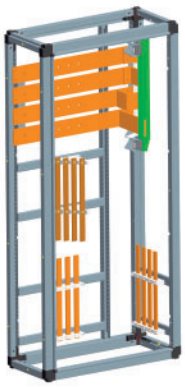


Rear fixation flat, up to 1600A 1

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2][3]			Insulator kit + support[4]	Extension kit[5]
IP30[1]	IP55	(mm)	2m	12 mod.	24 mod.	36 mod.		
1000	960	60x10	**887307**	**887425**	**887422**	**887419**	**887297**	**887325**
1250	1250	80x10	**887308**	**887426**	**887423**	**887420**	**887297**	**887326**
1600	1600	100x10	**887309**	**887427**	**887424**	**887421**	**887297**	**887327**

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included, order one piece per phase
(3) Ready for connectivity kit to vertical staircase busbar and/or MCCB
(4) Order one kit per enclosure
(5) To connect 2 horizontal busbars

Vertical busbars for 450 mm deep enclosures



Side fixation staircase, up to 1600A 4

I_n max (A) at 35°C		Cu size	Plain copper bars[1]	Pre-punched copper bars[2]	Support[3]	Spacer for double busbars[4]
IP30[1]	IP55	(mm)	2m	2m	36 mod. with int. cc	
670	440	30x10	**885206**	**887398**	**887296**	-
800	715	40x10	-	**887429**	**887296**	-
1000	960	50x10	**887306**	**887428**	**887296**	-
800	715	(30x10)x2	**885206**	**887398**	**887296**	**887269**
1250	1250	(40x10)x2	-	**887429**	**887296**	**887269**
1600	1600	(50x10)x2	**887306**	**887428**	**887296**	**887269**

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included
(3) Set of 6 supports
(4) Set of 24 spacers, usable for 1 set of 6 supports

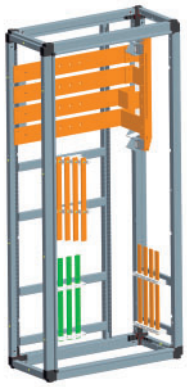
Minimum quantity of supports

Section/Icc	25kA	35kA	50kA
30x10	6	-	-
40x10	4	6	6
50x10	4	6	6
(30x10)x2	6	-	-
(40x10)x2	4	6	6
(50x10)x2	4	6	6

Connecting set for staircase busbar to main busbar

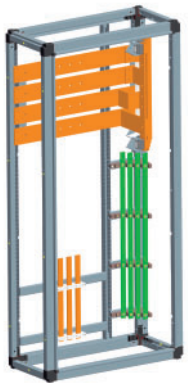
60x10	**887324**
80x10	**887323**
100x10	**887318**

Vertical busbars for 450 mm deep enclosures



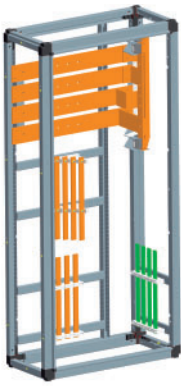
Rear fixation flat, up to 630A 5

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]			
IP30[1]	IP55	(mm)	3m	2m	4x1m	12 mod.	24 mod.	36 mod.	36 mod. with int. cc
275	210	20x5	**858036**	**885207**	**880847**	**887290**	**887291**	**887292**	**887291**
425	330	30x5	**885204**	**885209**	-	**887290**	**887291**	**887292**	**887291**
425	330	20x10	**885205**	**885208**	-	**887290**	**887291**	**887292**	**887291**
670	440	30x10	**885206**	**885210**	**880851**	**887290**	**887291**	**887292**	**887291**



Rear fixation staircase, up to 630A 6

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]	
IP30[1]	IP55	(mm)	3m	2m	4x1m	12 mod.	36 mod. with int. cc
250	210	20x5	**858036**	**885207**	**880847**	**887293**	**887294**
400	330	30x5	**885204**	**885209**	-	**887293**	**887294**
400	330	20x10	**885205**	**885208**	-	**887293**	**887294**
630	440	30x10	**885206**	**885210**	**880851**	**887293**	**887294**

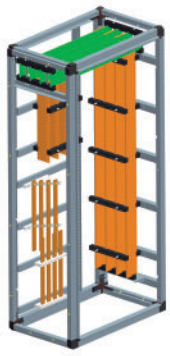


Side fixation flat, up to 630A 3

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]
IP30[1]	IP55	(mm)	3 m	2 m	4x1 m	36 mod. with int. cc
275	210	20x5	**858036**	**885207**	**880847**	**887334**
425	330	30x5	**885204**	**885209**	-	**887334**
425	330	20x10	**885205**	**885208**	-	**887334**
670	440	30x10	**885206**	**885210**	**880851**	**887334**

(1) Without door, for derating see technical documentation
(2) maximum distance between two supports is 300mm

Horizontal busbars for 600 mm deep enclosures



Side fixation flat, up to 2000A

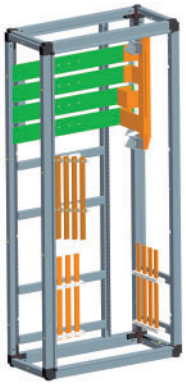
2

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2][3]			Support[4]	Insulator[4]	Extension kit[5]
IP30[1]	IP55	(mm)	2m	12 mod.	24 mod.	36 mod.		600 mm	800 mm
1100A	950A	50x10	887306	887399	887405	887411	887287	887312	887375
1300A	1100A	60x10	887307	887400	887406	887412	887287	887313	887376
1650A	1400A	80x10	887308	887401	887407	887413	887287	887314	887377
2000A	2000A	100x10	887309	887402	887408	887414	887287	887315	887378

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included
(3) Ready for connectivity kit to ACB
(4) For quantities to be ordered see table on B.25
(5) To connect two horizontal busbars

Quantity of supports/isolators needed

Cu size	12 mod.	24 mod.	36 mod.
Icc 35 kA			
50x10	2/2	2/3	2/3
60x10	2/2	2/3	2/3
80x10	2/2	2/2	2/3
100x10	2/2	2/2	2/3
Icc 50 kA			
50x10	2/2	2/3	2/4
60x10	2/2	2/3	2/3
80x10	2/2	2/3	2/3
100x10	2/2	2/3	2/3
Icc 65 kA			
60x10	2/3	2/4	2/4
80x10	2/3	2/3	2/4
100x10	2/2	2/3	2/3
Icc 80 kA and 85 kA			
80x10	2/3	2/4	2/5
100x10	2/3	2/4	2/4



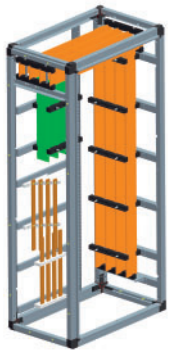
Rear fixation flat, up to 1600A

1

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2][3]			Insulator kit + support[4]	Extension kit[5]
IP30	IP55	(mm)	2 m	12 mod.	24 mod.	36 mod.		
1000A	950A	60x10	887307	887425	887422	887419	887297	887325
1250A	1100A	80x10	887308	887426	887423	887420	887297	887326
1600A	1400A	100x10	887309	887427	887424	887421	887297	887327

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included, order one piece per phase
(3) Ready for connectivity kit to vertical staircase busbar and/or MCCB
(4) Order one kit per enclosure
(5) To connect two horizontal busbars

Vertical busbars for 600 mm deep enclosures



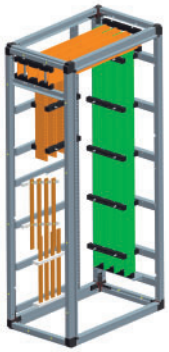
Rear fixation flat, up to 2000A

8

I_n max (A) at 35°C		Cu size	Plain copper bars[1]	Pre-punched copper bars[2]	Support[3]			Insulator[3]	Bottom isolator[4]
IP30[1]	IP55	(mm)	2m	1.75m	24 mod.	36 mod.	36 mod. with int. cc		
1100	950	50x10	**887306**	**887300**	**887298**	**887299**	**887298**	**887312**	**887289**
1300	1100	60x10	**887307**	**887301**	**887298**	**887299**	**887298**	**887313**	**887289**
1650	1400	80x10	**887308**	**887302**	**887298**	**887299**	**887298**	**887314**	**887289**
2000[5]	2000[5]	100x10	**887309**	**887303**	**887298**	**887299**	**887298**	**887315**	**887289**

Maximum distance between supports (mm)

Cu size	35kA	50kA	65kA
50x10	450	325	-
60x10	500	350	275
80x10	600	400	300
100x10	650	450	350

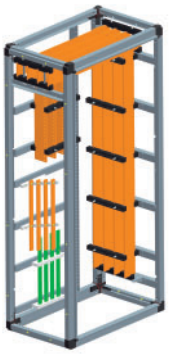


Side fixation flat, up to 2000A

7

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2]	Insulator kit[3]	Support[3]	Bottom isolator [4]
IP30[1]	IP55	(mm)	2 m	1.75 m			
1100	950	50x10	**887306**	**887300**	**887287**	**887312**	**887289**
1300	1100	60x10	**887307**	**887301**	**887287**	**887313**	**887289**
1650	1400	80x10	**887308**	**887302**	**887287**	**887314**	**887289**
2000	2000	100x10	**887309**	**887303**	**887287**	**887315**	**887289**

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included
(3) For quantities to be ordered see table on B.25
(4) One bottom isolator needed per busbar system, order an additional support for each bottom isolator

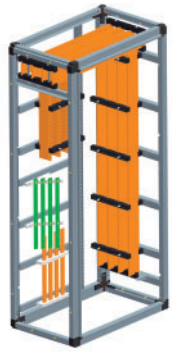


Rear fixation flat, up to 630A

9

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]			
IP30[1]	IP55	(mm)	3 m	2 m	4x1 m	12 mod.	24 mod.	36 mod.	36 mod. with int. cc
250	210	20x5	**858036**	**885207**	**880847**	**887290**	**887291**	**887292**	**887291**
400	330	30x5	**885204**	**885209**	-	**887290**	**887291**	**887292**	**887291**
400	330	20x10	**885205**	**885208**	-	**887290**	**887291**	**887292**	**887291**
630	440	30x10	**885206**	**885210**	**880851**	**887290**	**887291**	**887292**	**887291**

(1) Without door, for derating see technical documentation
(2) Maximum distance between two supports is 300 mm



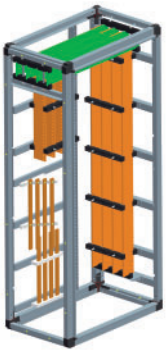
Rear fixation staircase, up to 630A

10

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]	
IP30[1]	IP55	(mm)	3 m	2 m	4x1 m	12 mod.	36 mod. with int. cc
250	210	20x5	**858036**	**885207**	**880847**	**887293**	**887294**
400	330	30x5	**885204**	**885209**	-	**887293**	**887294**
400	330	20x10	**885205**	**885208**	-	**887293**	**887294**
630	440	30x10	**885206**	**885210**	**880851**	**887293**	**887294**

(1) According to EN13601
(2) In one reference there is one busbar included, order one piece per phase
(3) For quantities to be ordered see table on B.25

Horizontal busbars for 800 mm deep enclosures



Side fixation flat, up to 4000A

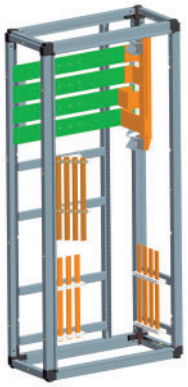
2

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2][3]			Support[4]	Insulator kit[4]	Extension kit[5]
IP30[1]	IP55	(mm)	2 m	12 mod.	24 mod.	36 mod.		800 mm	
1100	950	50x10	887306	887399	887405	887411	887288	887312	887375
1300	1100	60x10	887307	887400	887406	887412	887288	887313	887376
1650	1400	80x10	887308	887401	887407	887413	887288	887314	887377
2000	2000	100x10	887309	887402	887408	887414	887288	887315	887378
2500	2500	(80x10)x2	887308	887401	887407	887413	887288	887314	-
3000	2950	(100x10)x2	887309	887402	887408	887414	887288	887315	887378
3600	3300	(120x10)x2	887310	887403	887409	887415	887288	887316	887379
4000	3800	(160x10)x2	887311	887404	887410	887416	887288	887317	887380

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included
(3) Ready for connectivity kit to ACB
(4) For quantities to be ordered see table on B.25
(5) To connect two horizontal busbars

Quantity of supports/isolators needed

Cu size	12 mod.	24 mod.	36 mod.	Cu size	12 mod.	24 mod.	36 mod.
Icc 35 kA				Icc 65 kA			
50x10	2/2	2/3	2/3	-	-	-	-
60x10	2/2	2/3	2/3	60x10	2/3	2/4	2/4
80x10	2/2	2/2	2/3	80x10	2/3	2/3	2/4
100x10	2/2	2/2	2/3	100x10	2/2	2/3	2/3
(80x10)x2	2/2	2/2	2/3	(80x10)x2	2/2	2/3	2/3
(100x10)x2	2/2	2/2	2/3	(100x10)x2	2/2	2/3	2/3
(120x10)x2	2/2	2/2	2/2	(120x10)x2	2/2	2/3	2/3
(160x10)x2	2/2	2/2	2/2	(160x10)x2	2/2	2/3	2/3
Icc 50 kA				Icc 80 kA and 85 kA			
50x10	2/2	2/3	2/4	-	-	-	-
60x10	2/2	2/3	2/3	-	-	-	-
80x10	2/2	2/3	2/3	80x10	2/3	2/4	2/5
100x10	2/2	2/3	2/3	100x10	2/3	2/4	2/4
(80x10)x2	2/2	2/3	2/3	(80x10)x2	2/3	2/4	2/4
(100x10)x2	2/2	2/3	2/3	(100x10)x2	2/3	2/4	2/4
(120x10)x2	2/2	2/2	2/2	(120x10)x2	2/2	2/4	2/4
(160x10)x2	2/2	2/2	2/2	(160x10)x2	2/2	2/4	2/4



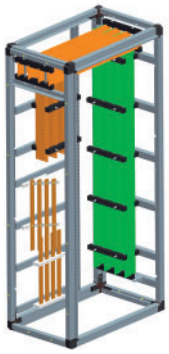
Rear fixation flat, up to 1600A

1

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2][3]			Insulator kit[4]	Extension kit[5]
IP30[1]	IP55	(mm)	2 m	12 mod.	24 mod.	36 mod.		
1000A	950A	60x10	887307	887425	887422	887419	887297	887325
1250A	1100A	80x10	887308	887426	887423	887420	887297	887326
1600A	1400A	100x10	887309	887427	887424	887421	887297	887327

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included, order one piece per phase
(3) Ready for connectivity kit to vertical staircase busbar and/or MCCB
(4) Order one kit per enclosure
(5) To connect two horizontal busbars

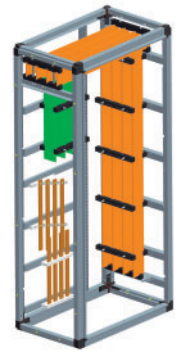
Vertical busbars for 800 mm deep enclosures



Side fixation flat, up to 4000A

7

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2]	Support[3]	Insulator kit[3]	Bottom isolator[4]
IP30[1]	IP55	mm	2 m	1.75 m			
1100	950	50x10	**887306**	**887300**	**887288**	**887312**	**887289**
1300	1100	60x10	**887307**	**887301**	**887288**	**887313**	**887289**
1650	1400	80x10	**887308**	**887302**	**887288**	**887314**	**887289**
2000	2000	100x10	**887309**	**887303**	**887288**	**887315**	**887289**
2500	2500	(80x10)x2	**887308**	**2x887302**	**887288**	**887314**	**887289**
3600	3300	(120x10)x2	**887310**	**887304**	**887288**	**887316**	**887289**
4000	3800	(160x10)x2	**887311**	**887305**	**887288**	**887317**	**887289**



Rear fixation flat, up to 2000A

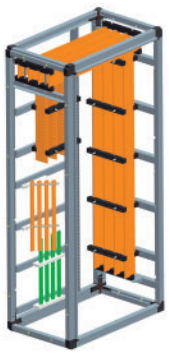
8

I_n max (A) at 35°C		Cu size	Plain copper bars	Pre-punched copper bars[2]	Support[3]			Insulator kit[3]	Bottom isolator[4]
IP30[1]	IP55	mm	2 m	1.7 m	24 mod.	36 mod.	36 mod. with int. cc		
1100	950	50x10	**887306**	**887300**	**887298**	**887299**	**887298**	**887312**	**887289**
1300	1100	60x10	**887307**	**887301**	**887298**	**887299**	**887298**	**887313**	**887289**
1650	1400	80x10	**887308**	**887302**	**887298**	**887299**	**887298**	**887314**	**887289**
2000	2000	100x10	**887309**	**887303**	**887298**	**887299**	**887298**	**887315**	**887289**

(1) Without door, for derating see technical documentation
(2) In one reference there is one busbar included
(3) For quantities to be ordered see table on B.25
(4) One bottom isolator needed per busbar system, order an additional support for each bottom isolator

Maximum distance between supports (mm)

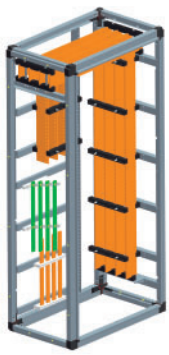
Cu size	50kA	65kA	80kA	85kA
80x10	400	300	-	-
100x10	450	350	250	200
(120x10)x2	900	600	400	375
(160x10)x2	900	600	400	375



Rear fixation flat, up to 630A

9

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]			
IP30[1]	IP55	mm	3 m	2 m	4x1 m	12 mod.	24 mod.	36 mod.	36 mod. with int. cc
250	210	20x5	**858036**	**885207**	**880847**	**887290**	**887291**	**887292**	**887291**
400	330	30x5	**885204**	**885209**	-	**887290**	**887291**	**887292**	**887291**
400	330	20x10	**885205**	**885208**	-	**887290**	**887291**	**887292**	**887291**
630	440	30x10	**885206**	**885210**	**880851**	**887290**	**887291**	**887292**	**887291**



Rear fixation staircase, up to 630A

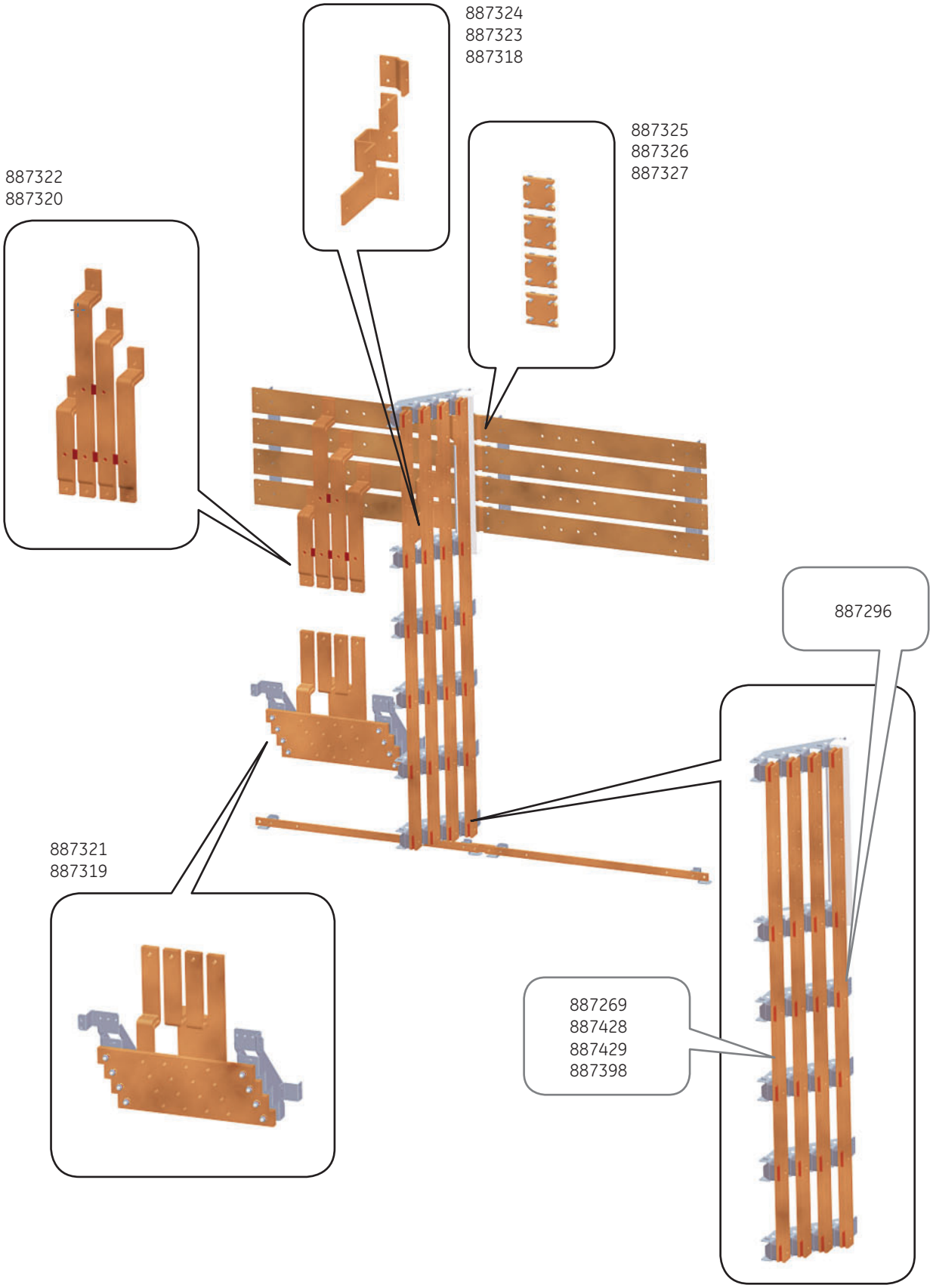
10

I_n max (A) at 35°C		Cu size	Plain copper bars	Threaded copper bars		Insulator kit + support[2]	
IP30[1]	IP55	mm	3 m	2 m	4x1 m	12 mod.	36 mod. with int. cc
250	210	20x5	**858036**	**885207**	**880847**	**887293**	**887294**
400	330	30x5	**885204**	**885209**	-	**887293**	**887294**
400	330	20x10	**885205**	**885208**	-	**887293**	**887294**
630	440	30x10	**885206**	**885210**	**880851**	**887293**	**887294**

(1) Without door, for derating see technical documentation
(2) Maximum distance between two supports is 300 mm

Connectivity

QuiXtra 4000 offers following connectivity solutions: busbar to busbar, ACB to busbar, MCCB to busbar, MCCB cable connection and connectivity accessories.



Busbar to busbar

For connecting two busbars, there are two connectivity solutions: extension kits for connecting 2 horizontal busbars and connection kits for connecting a staircase busbar to a horizontal busbar with rear fixation. Depending on the busbar fixation and on the copper size, QuiXtra4000 offers different extension kits.

Extension kit for rear fixation busbar

Extension and connection kits

	Cu size	Ref. No.
Extension kit horizontal busbar **side** fixation	50x10	**887375**
	60x10	**887376**
	80x10	**887377**
	100x10	**887378**
	120x10	**887379**
	160x10	**887380**
Extension kit horizontal busbar **rear** fixation	60x10	**887325**
	80x10	**887326**
	100x10	**887327**
Connection kit vertical staircase busbar to horizontal busbar **rear** fixation	60x10	**887324**
	80x10	**887323**
	100x10	**887318**

Connectivity kit for Heavy Duty

ACB to busbar

For connecting an Air Circuit Breaker to a horizontal busbar with side fixation, QuiXtra 4000 offers a complete range of connectivity solutions: M-PACT Plus frame 1 (2000A) and frame 2 (4000A); EntelliGuard frame 1 (2000A), frame 2 (4000A) and frame 2 heavy duty (for reduced heat dissipation).

Connectivity kit EntelliGuard to horizontal busbar with side fixation

Size	Version	I_n max	Ref. No.[1]
Frame 1 3P	Fixed	2000A	**887248**
Frame 1 4P	Fixed	2000A	**887249**
Frame 2 3P	Fixed	4000A	**887250**
Frame 2 4P	Fixed	4000A	**887251**
Frame 1 3P	Withdrawable	2000A	**887252**
Frame 1 4P	Withdrawable	2000A	**887253**
Frame 2 3P	Withdrawable	4000A	**887254**
Frame 2 4P	Withdrawable	4000A	**887255**
Frame 2 3P Heavy Duty	Withdrawable	4000A	**887352**
Frame 2 4P Heavy Duty	Withdrawable	4000A	**887353**

Connectivity kit M-PACT Plus to horizontal busbar with side fixation

Size	Version	I_n max	Ref. No.[1]
Frame 1 3P	Fixed	2000A	**887248**
Frame 1 4P	Fixed	2000A	**887249**
Frame 2 3P	Fixed	4000A	**887250**
Frame 2 4P	Fixed	4000A	**887251**
Frame 1 3P	Withdrawable	2000A	**887252**
Frame 1 4P	Withdrawable	2000A	**887253**
Frame 2 3P	Withdrawable	4000A	**887335**
Frame 2 4P	Withdrawable	4000A	**887336**

Supports for connectivity kit ACB (EntelliGuard or M-Pact Plus)

Size	Width	I_n max	Ref. No.
Frame 1 3/4P	24 mod.	2000A	**887374**
Frame 1 3P	36 mod.	2000A	**887417**
Frame 1 4P	36 mod.	2000A	**887430**
Frame 2 3P	36 mod.	4000A	**887418**
Frame 2 4P	36 mod.	4000A	**887431**
Frame 2 3P Heavy Duty[2]	36 mod.	4000A	**887373**
Frame 2 4P Heavy Duty[2]	36 mod.	4000A	**887295**

(1) This kit needs to be completed with the correct support.
(2) Connectivity kit for Heavy Duty, see previous page.

MCCB to busbar

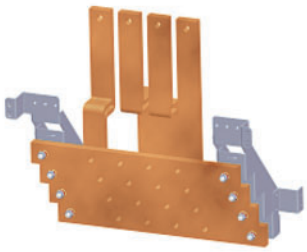
For connecting a Moulded Case Circuit Breaker to a horizontal busbar with rear fixation, QuiXtra 4000 offers a RecordPlus FK connectivity kit.

MCCB outgoing connection to busbar

	Size	Ref. No.
Connectivity kit RecordPlus to horizontal busbar **rear fixation**	FK frame 800A	**887322**
	FK frame 1250A/1600A	**887320**

MCCB to cables

For the easy connection of incoming or outgoing cables on a RecordPlus FK, QuiXtra 4000 offers a range of FK connection kits.



MCCB incoming cable connection

	Size	Ref. No.
Incoming connection kit RecordPlus	FK frame 800A	**887321**
	FK frame 1250A/1600A	**887319**

Cable management

For mounting a large cable duct e.g. above terminals, a function of 200 mm high has been developed. Cable ducts or other accessories can easily be mounted.

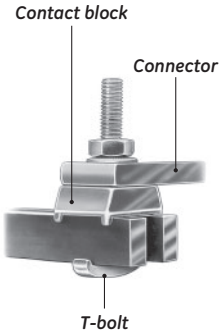
Horizontal cable management

	Ref. No.
Function for canalization horizontal 24 mod. 200 mm height	**887340**
Function for canalization horizontal 36 mod. 200 mm height	**887341**
Cable trunk support for DIN-rail	**828145**

Accessories

Connectivity accessories

	Size	Ref. No.
Connector for flexible copper	max Cu width 32 mm	828142(1)
Connector for cable gland 20 mm or 25 mm width	20 or 25 mm	858004(1)
Connector for cable gland 25 mm, 30 mm or 40 mm width	25, 30 or 40 mm	858003(1)
Cable connectors	1.5-16 mm²	858026(1)
	1.5-35 mm²	858028(1)
	16-70 mm²	858032(1)
	16-120 mm²	858033(1)
Contact block		858006
T-bolt for 2x10 mm busbar length: 60 mm	Cu 20x10	858013
80 mm	Cu 40x10	858011
90 mm	Cu 50x10	858014
120 mm	Cu 80x10	858016
140 mm	Cu 100x10	858017
Fastener bolts (40 pcs)	M6x16 mm	883617
	M8x20 mm	880852



(1) Contact block and T-bolt needed

General accessories

Description	Ref. No.
Set depth profiles: 450 mm	887328
600 mm	887329
800 mm	887330
Coupling bracket for base: 450 mm	887381
600 mm	887382
800 mm	887383
Lighting unit 24 mod. height 50 mm	887285
Lighting unit 36 mod. height 50 mm	887286
Bracket for recessed or adjustable DIN-rail	887348
Hinge for coverplate	885285
Earthing cable for door 6 mm²	887345
Universal bracket for main earth bar	887347
Lifting brackets for coupled enclosures	887331
Lifting eyes standard (4 pcs) Max 480 kg/column	887283
Lifting eyes heavy duty (4 pcs) Max 1000 kg/column	887339
Note: Check lifting instructions	
Height adaptor RecordPlus - ElfaPlus (1200 mm)	883997
Height adaptor RecordPlus - ElfaPlus (354 mm)	617947
Blanking strip 1000 mm	828056
Blanking strip 72 mm (4 mod.)	610142
Blanking strip for RecordPlus FD and FE 1200 mm	883970
Label holder 12 mod.	885249
Label holder 24 mod.	885250
Label holder 36 mod.	885251
Drawing pocket A5	832000
Drawing pocket A4	811516
Paint RAL 9006 for minor touch-ups external panel	885252
Paint RAL 7024 for minor touch-ups external panel	885253
Handle for half cylinder (on request)	887346
Profile half cylinder with 2 keys V2432	832030
Profile half cylinder with 1 square key 8 mm	832032
Profile half cylinder with 1 triangular key 8 mm	832033
Profile half cylinder with 2 keys A434	843248

Notes

QuiXtra 4000 is a range of sheet steel system enclosures, delivered as a flat kit: the GE solution for low voltage distribution boards up to 4000A, in high commercial and industrial environments.

QuiXtra 4000 is designed to be a reliable, simple, flexible and easy to use system enclosure, expanding the QuiXtra 630 line, with the same benefits and the same fresh and attractive design.

The QuiXtra 4000 range consists of 9 different enclosures. There are three enclosure depths available, from 450 mm up to 800 mm, and three enclosure widths, for functions of 12, 24 or 36 modules. All enclosures have the same height (1800 mm useful), allowing side to side coupling for the enclosures with same depth, and back to back coupling for the enclosures with the same width, providing the user total flexibility to define the layout of the LV distribution boards, even L and U layouts using the corner enclosures.

The kit form design allows the optimization of number of references versus the range of enclosures configurations. Basically the panels can be built with 2 protection degrees IP30 or IP55. Once the frame are assembled, the busbar system, mounting plates, supports for electrical devices and the DIN-rails are easily fixed to the frame, with accessibility from all sides. After wiring, the enclosure can be closed by the rear, top and side panels and cover plates. Thanks to the QuiXtra intelligent design, the labor time required to build a distribution panel is minimal, with higher flexibility in the panel layout

The attractive design of QuiXtra 4000, the same as QuiXtra 630, makes the line suitable for commercial environments. The QuiXtra 4000 colour is metallic silver, RAL9006; the external corner parts, the handle and the base are in dark grey, RAL7024. The tempered glass of the transparent door is lightly smoked in grey.

Main technical characteristics

Useful and external dimensions (mm)

			Useful dimensions			External dimensions		
		Mounting plate width	Width for devices	Depth	Height	Width	Depth	Height
Depth 450	12 mod	238	216 (12 mod)	375	1800	447	450	2155
	24 mod	534	432 (24 mod)	375	1800	743	450	2155
	36 mod	750	648 (36 mod)	375	1800	959	450	2155
Depth 600	12 mod	238	216 (12 mod)	525	1800	447	600	2155
	24 mod	534	432 (24 mod)	525	1800	743	600	2155
	36 mod	750	648 (36 mod)	525	1800	959	600	2155
Depth 800	12 mod	238	216 (12 mod)	725	1800	447	800	2155
	24 mod	534	432 (24 mod)	725	1800	743	800	2155
	36 mod	750	648 (36 mod)	725	1800	959	800	2155

Material and colour

Frame profiles	Sendzimir zinc plated steel 1.5 mm
External panels	Epoxy-polyester coated sheet steel 1.5 mm
Plain door	Epoxy-polyester coated sheet steel 1.5 mm
Transparent door	Epoxy-polyester coated sheet steel 1.5 mm and smoked safety glass 3 mm.
Cover plates	Epoxy-polyester coated sheet steel 1 mm
External plastic	ABS
Internal corners	Die-cast aluminium alloy
Enclosure colour	RAL 9006
Floor base colour	RAL 7024

Protection degree and segregation form

Protection class	I
Pollution degree	3
Segregation	Up to Form 3b
Protection degree	
Without door	IP30, IK08
With plain door and with IP55 panels	IP55, IK09
With plain door and with IP30 panels	IP30, IK09
With transparent door and with IP55 panels	IP55, IK08
With transparent door and with IP30 panels	IP30, IK08

Standards and approvals

Standards	IEC 61439-2
	EN 61439-2
Approval	**DEKRA** with KEMA quality testreport
Certification	**DEKRA** with KEMA quality testreport
RoHS compliant	YES
REACH compliant	YES

Electrical characteristics

Rated current (In)	4000A
Rated operational voltage (Ue)	415V, 690V
Rated insulation voltage (Ui)	1000V
Rated frequency (fn) 50/60 Hz	50/60Hz
Rated short-circuit current max (Icw)	85kA/1s
Rated current of busbar systems	4000A in IP30

Enclosure

The basic QuiXtra 4000 frame enclosure is built by ordering 4 kits:

- Top/bottom frames, depending on the dimensions width and depth, and on the IP degree
- Vertical profiles. Common for all the enclosures dimensions
- Top panels, depending on the cable entry plates options desired
- Functional frame. With or without integrated cable compartment in the enclosures 36 modules wide and with or without functional door

The vertical profiles are fixed to the top and bottom frames mean 2 screws in each corner, achieving a rigid and reliable frame. The die-cast aluminium corner parts, with the profiles 1.5 mm thick, provide the required rigidity to the frame.

The external covers; rear, side and doors are made of epoxy-polyester coated sheet steel, with a thickness of 1.5 mm. The top cover, rear and side panels can be delivered in 2 versions, including or not a PUR gasket, to achieve the IP30 or IP55.
The external panels can be assembled by a single person. In both cases the panels are supported by the top frame, allowing the easy fixation of the external cover screws to the frame.

Door

QuiXtra 4000 offers plain and transparent (tempered glass) doors. The doors are equipped with a centrally operated four point locking mechanism. The handle is delivered with a standard lock insert for key 2432E. The opening angle is 135 degrees, for both types of doors. Mounting the doors to the enclosure is done without tools, using the simple pin-hinges. The doors are delivered with hinges and the locking mechanism mounted, to reduce assembly time. The door is standard delivered right hinging. Changing to left hinging is done easily.

Functional units

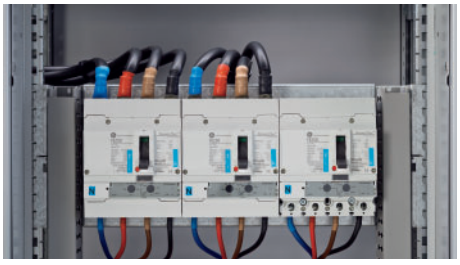
All GE LV electrical devices up to 4000A can be easily assembled in QuiXtra 4000 using the appropriate functional units. Each functional kit includes all parts necessary for assembly:

- A mounting plate, support or DIN-rail. Some supports requires depth profiles for its fixation
- A cover plate (with precise cut-outs)
- Fixation parts

Attaching the mounting plates or DIN-rails does not require tools: they are attached to the functional frame using a "click in" support. The cover plates are attached to two profiles using captive 90° screws. it's possible to fix all the cover plates to a functional door, allowing to open all the cover plates in one shot. It's the perfect solution for maintenance purposes.
QuiXtra 4000 has sufficient wiring space for all possible layouts. Several ready-to-install copper connections between the main breaker and the main busbar are available, to make the panel constructions easier and more reliable.
The mounting plates of the functional units are made of sendzimir zinc plated steel 1.5 mm, and the cover plates of epoxy-polyester coated sheet steel 1 mm.

Coupling of enclosures

The QuiXtra 4000 allows unlimited side to side horizontal coupling for enclosures of same depth, and it can be assembled back to back for the enclosures with the same width. Coupling is done just adding a gasket between the enclosures, and with screws that fix directly the 2 adjacent vertical profiles. The same coupling concept is used in both directions, side to side and back to back.



Corrosion protection

The enclosure is protected against corrosion by epoxy polyester coating of the external panels. The unpainted parts (the rear panel, vertical profiles, mounting plates and functional supports) are made of sendzimir zinc plated steel.

Painting and coating

All external panels and cover plates are powder coated.
The colour is RAL 9006, with a minimum thickness of 75 µm.
The painting procedure is as follows:

Phase 1: Degreasing in simultaneous degreasing and iron phosphating bath. Temp. 45-55°C
Phase 2: Degreasing in the same bath. Temp. 15-26°C
Phase 3: Degreasing in the same bath. Temp. 15-26°C
Phase 4: Iron phosphating in the same bath. Temp. 25-35°C
Phase 5: Rinsing
Phase 6: Passivation process in bath without chromium 6+. Temp. 15-26°C
Phase 7: Rinsing with demineralised water
Phase 8: Heat drying in oven. Temp. 120°C
Phase 9: Manual electrostatic powder coating in required colour
Phase 10: Curing in oven. Temp. 180°C
Phase 11: Quality control of random samples
- visual inspection
- control of coating thickness
- cross cut test

Protection degree

The QuiXtra 4000 protection degree is either IP30 or IP55. IP30 is achieved simply using the top and bottom frame and external covers in IP30, or using the IP55 version without door. To achieve the IP55 protection degree is required to use the top and bottom frame and external covers IP55 and adding the door.

Busbars

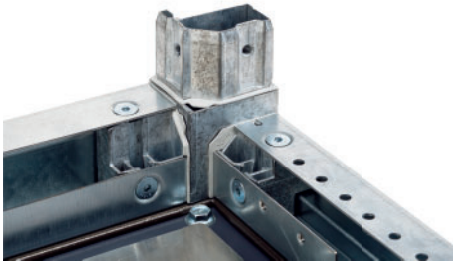
The busbar system for QuiXtra 4000 is developed to ensure easy installation of the copper bars, easy and quick wiring of electrical devices and the most compact solution possible. The busbar system is based in standard copper dimensions of 10 mm thickness.

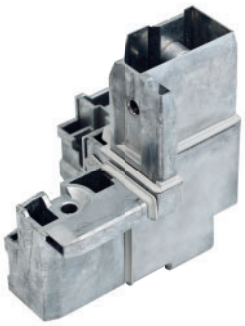
QuiXtra 4000 offers several types of busbar systems. The possible busbar types depend on the depth of the enclosures.

Possible busbars system for 450 mm deep enclosures
- Main horizontal busbars up to 1600A. Located at the rear of the enclosure. One phase over the other.
- Vertical busbar system. Staircase busbars up to 630A, and staircase busbar up to 1600A in integrated cable compartment. Side busbar up to 630A. Rear busbar up to 630A.

Possible busbars system for 600 mm deep enclosures
- Main horizontal busbar up to 2000A. Located on the top or middle height position. The phases are assembled one behind the other.
- Vertical busbar system. 2 rear busbar system solutions, up to 630A and up to 1600A. One staircase busbars, up to 630A, for 12 modules enclosures and integrated cable compartment. One side busbar system up to 2000A, for 12 modules enclosures and integrated cable compartment. And finally one vertical busbar up to 2000A to install in the enclosure 12 module wide.

Possible busbars system for 800 mm deep enclosures
- Main horizontal busbar up to 4000A. Located on the top or middle height position. The phases are assembled one behind the other.
- Vertical busbar system. 2 rear busbar system solutions, up to 630A and up to 1600A. One staircase busbar, up to 630A, for 12 modules enclosures and integrated cable compartment. One side busbar system up to 2000A, for 12 modules enclosures and integrated cable compartment. And finally one vertical busbar up to 4000A to install in the enclosure 12 module wide.





Copper bar and support selections

The following table provides the required information to select the cross section of each busbar system

Derating table

Rated current	Ambient temp 35°C						Cu bars/ phase	Cu bar dimensions (mm)	Enclosure depth (mm)
In	IP30 (without door)		IP30 (with door)		IP55		L1-L2-L3-N	Height x thickness	
Supports for side fixation	Vert.	Horz.	Vert.	Horz.	Vert.	Horz.			
250A	275A	275A	210A	210A	210A	210A	1	20x5	
400A	425A	425A	330A	330A	330A	330A	1	20x10	
630A	670A	670A	440A	440A	440A	440A	1	30x10	
1000A	1100A	1100A	950A	950A	950A	950A	1	50x10	
1250A	1300A	1300A	1100A	1100A	1100A	1100A	1	60x10	
1600A	1650A	1650A	1400A	1400A	1400A	1400A	1	80x10	
2000A	2000A	2000A	2000A	2000A	2000A	2000A	1	100x10	
2500A	2500A	2500A	2500A	2500A	2500A	2500A	2	80x10	
3200A	3600A	3600A	3300A	3300A	3300A	3300A	2	120x10	
4000A	4000A	4000A	3800A	4000A	3800A	4000A	2	160x10	
Supports for rear fixation									
1600A	-	1600A	-	1600A	-	1600A	1	100x10	
Staircase supports									
1600A	1600A	-	1600A	-	1600A	-	2	50x10	
630A	630A	-	630A	-	630A	-	1	30x10	
Incomers									
Record Plus K Frame 1600A	1150A	-	1000A	-	1000A	-			450
EntelliGuard Frame 1 fixed 2000A	2000A	-	1800A	-	1800A	-			600
M-PACT Plus Frame 1 fixed 2500A	2000A	-	1650A	-	1650A	-			600
EntelliGuard Frame 2 withdrawable 4000A	2850A	-	2400A	-	2400A	-			800
M-PACT Plus Frame 2 withdrawable 4000A	2900A	-	2900A	-	2500A	-			800
EntelliGuard Frame 2 withdrawable 100% 4000A	3450A	-	2800A	-	2800A	-			800

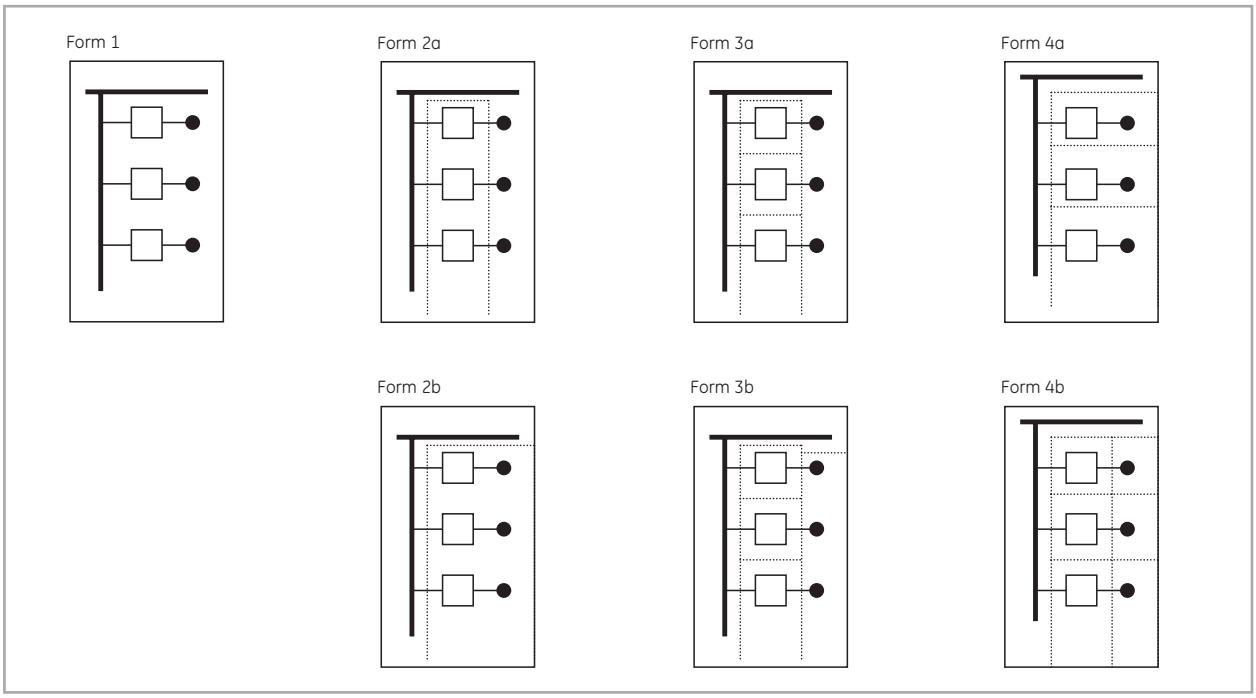
Form of internal separation

QuiXtra 4000 is available with internal separation up to Form 3.

Form 1: Functional units, busbars and terminals are protected against outside contact within the QuiXtra enclosure, but are internally not separated from each other.

Form 2: Same as Form 1, but an insulating screen separates the busbars from the functional units and terminals.

Form 3: Additionally to the Form 2, there are separation screens between the functions to avoid that any issue in one functional unit will be transmitted to another one. There are separation screens available to achieve the Form 2 and 3, and special references to assure the Form 3 in the functional units for the ACBs.



Earthing concept

The earth continuity in QuiXtra 4000 is assured via the screws that fix the panels to the frame parts. Each special screw removes the paint in the contact area. The earth continuity of the cover plates is guaranteed by removing the paint in the contact area with the enclosure. Supports for main earth bars, in standard copper dimensions, are available.

Verification of acceptable temperature rise

The verification of the acceptable temperature rises in QuiXtra 4000 may be made by calculation if all of the following conditions are fulfilled.

1. There is an approximately even distribution of power losses inside the enclosure
2. The load current of the circuits of QuiXtra 4000 shall not exceed 80% of the rated current mentioned on the switching device and electrical components included in the circuit. Circuit breakers and thermal motor protection shall be selected to ensure adequate protection to outgoing circuits at the calculated temperature in the assembly. Influence of temperature on the tripping times is available in the appropriate product catalogue.
3. The mechanical parts and the installed equipment are so arranged that air circulation is not significantly impeded.
4. Conductor carrying currents in excess of 200A, and the adjacent metal structural parts are so arranged that eddy-currents and hysteresis losses are minimized
5. All conductors shall have a minimum cross-sectional based on the current rating of the device according to IEC 60364-5-52.
   Minimum sections as defined in table 5 and 6 (page C.19), unless larger conductors are specified in the QuiXtra 4000 assembling instructions.

Examples on how to adapt the conductor sections for conditions inside QuiXtra 4000 are given in table 1 and 2 (page C.17)

6. Calculate the total power losses in the QuiXtra:
   a. Power losses of the components (Record Plus, Dilos, Fulos, Redline/ElfaPlus)
   b. Power losses of the conductors and busbars
   c. Power losses of other auxiliaries
   d. Add all the power losses
7. Choose the appropriate size of QuiXtra 4000 enclosure:
   a. Look for the appropriate table power dissipation/ temperature rise: tables are available for different positioning of the enclosure
   b. Maximum allowed temperature rise at the top of the enclosure: **40K**
      Limit accessible parts during normal operation to max **+30K**
   c. The temperature in °C in the enclosure is the **sum** of the **ambient** temperature outside the QuiXtra and the **temperature rise** in K found in the tables.
      Record Plus can be used up to **70°C**
      Dilos/Fulos up to **60°C**
      Redline/ElfaPlus can be used up to **50°C**
      Apply the appropriate current derating of these components (see page C.10 - C.16).

Examples on page C.26 - C.29

Derating tables for ElfaPlus MCBs

Influence of ambient air temperature on the rated current

The maximum value of the current which can flow through a MCB depends of the nominal current of the MCB, the conductor cross-section as well as of the ambient air temperature.

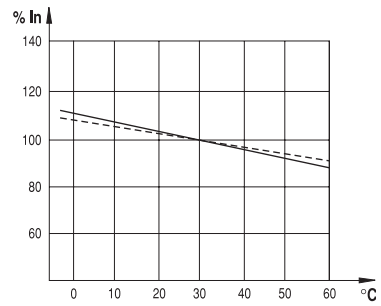
The values shown in the table below are for devices in the free air. For devices installed with other modular devices in the same switchboard a correction factor (K) shall be applied relative to the mounting situation of the MCB, the ambient temperature and the number of main circuits in the installation (according IEC 61439-2):

No. of devices	K
2 or 3	0,9
4 or 5	0,8
6 to 9	0,7
> 10	0,6

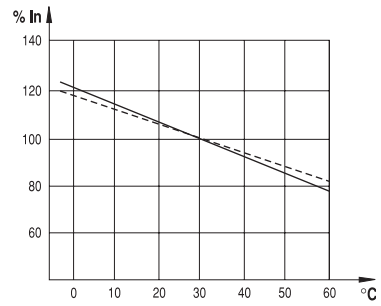
Calculation example
Within a distribution board consisting of eight 2P MCB C16 with an operating ambient temperature of 45°C, which is the highest temperature the MCB can operate without unwanted tripping.

Calculation
The correction factor is K=0.7 for use in a eight circuit installation: 16A x 0.7= 11.2A
As the MCB is working at 45°C it shall be applied another factor (90% = 0.9):
In at 45°C = In at 30°C x 0.9 = 11.2A x 0.9 = 10.1A

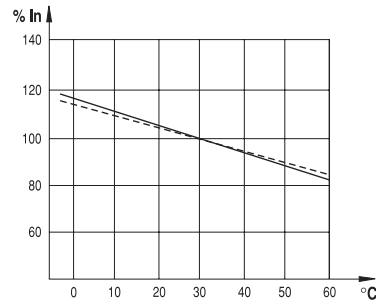
0,5 - 6A



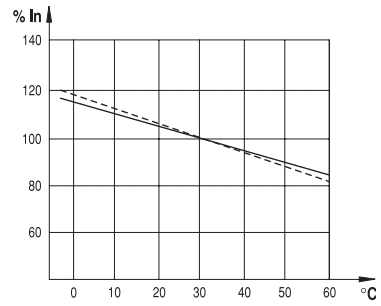
10A



16 - 40A



50 - 63A



——— : 1P (single pole)
— — : mP (multipole)

The thermal calibration of the MCBs was carried out at ambient temperature of 30°C. Ambient temperatures different from 30°C influence the bimetal and this results in earlier or later thermal tripping.

Derating tables for ElfaPlus RCDs

Influence of air ambient temperature on the rated current

Influence of temperature on RCCBs

The maximum value of the current which can flow through an RCCB depends of the nominal current as well as the ambient air temperature. The protective device placed up-stream of the RCCB must ensure the disconnection at the values in the following table:

In	25°C	30°C	40°C	50°C	60°C
16A	19	18	16	14	13
25A	31	28	25	23	25
40A	48	44	40	36	32
63A	76	69	63	57	51
80A	97	88	80	72	65
100A	121	110	100	90	81
125A	151	137	125	112	101

The above mentioned values are for devices in the free air. For devices installed with other modular devices in the same switchboard, a correction coefficient (K) shall be applied in relation to the number of main circuits in the installation (according IEC 61439-2):

No. of devices	K
2 or 3	0,9
4 or 5	0,8
6 to 9	0,7
> 10	0,6

Calculation example

Within a distribution panel consisting in eight 2P MCB C16 and with an operating ambient temperature of 45°C, which is the highest temperature the MCB can operate at without unwanted tripping.

Calculation

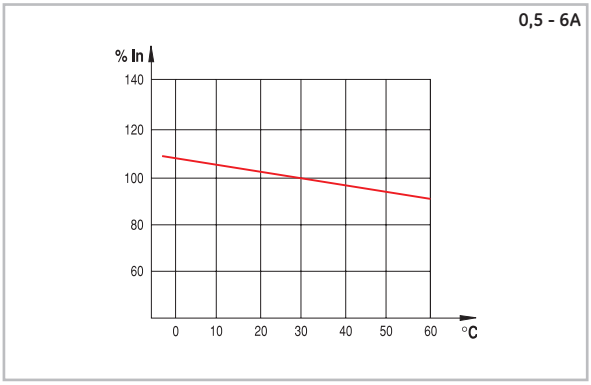
The correction factor is K=0.7 for use in an eight circuit installation: 16A x 0.7= 11.2A

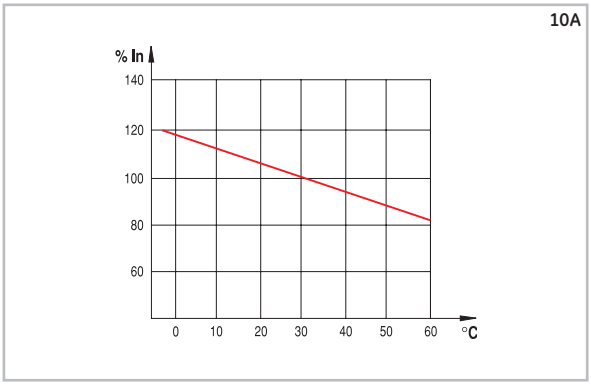
As the MCB is working at 45°C another factor is applied (90% = 0.9):

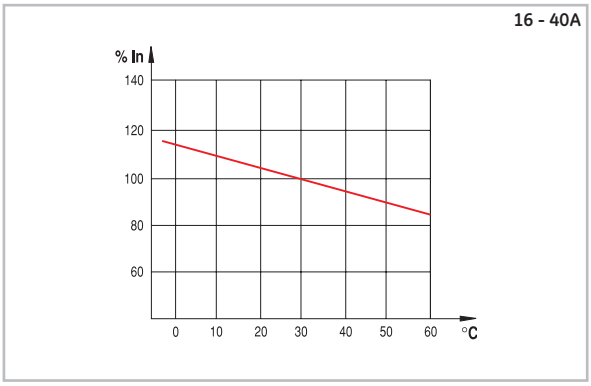
At 45°C = In at 30°C x 0.9 = 11.2A x 0.9 = 10.1A

Influence of temperature on RCBOs Series DP and DPE

The thermal calibration of the RCBO was carried out at an ambient temperature of 30°C. Ambient temperatures different from 30°C influence the bimetal and this results in earlier or later thermal tripping.







Derating tables for MCCBs Record Plus™

Thermal magnetic trip units

The ambient temperature in the direct vicinity of a protective device has an influence on its current carrying properties. The Record Plus™ breakers with thermal magnetic and magnetic only protection units as the MO, LTM and LTMD types can be used at currents and temperatures as indicated in the table.

Maximum permissible current at an ambient temperature

Type	Fixed breaker								Plug in or drawout breaker						
	In (A)	40°C	45°	50°C	55°C	60°C	65°C	70°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
FD63. FD160. FE160 and FE250	16	16.0	15.5	15.0	14.6	14.1	13.6	13.1	15.0	14.6	14.1	13.7	13.2	12.8	12.3
	25	25.0	24.3	23.5	22.8	22.0	21.3	20.5	23.5	22.8	22.1	21.4	20.7	20.0	19.3
	32	32.0	31.0	30.1	29.1	28.2	27.2	26.2	30.1	29.2	28.3	27.4	26.5	25.6	24.7
	40	40.0	38.8	37.6	36.4	35.2	34.0	32.8	37.6	36.5	35.3	34.2	33.1	32.0	30.8
	50	50.0	48.5	47.0	45.5	44.0	42.5	41.0	47.0	45.6	44.2	42.8	41.4	40.0	38.5
	63	63.0	61.1	59.2	57.3	55.4	53.6	51.7	59.2	57.4	55.7	53.9	52.1	50.3	48.6
	80	80.0	77.6	75.2	72.8	70.4	68.0	65.6	75.2	72.9	70.7	68.4	66.2	63.9	61.7
	100	100	97.0	94.0	91.0	88.0	85.0	82.0	94.0	91.2	88.4	85.5	82.7	79.9	77.1
FD160	125	125	121	118	114	110	106	103	118	114	110	107	103	100	96
	160	160	155	150	146	141	136	131	-	-	-	-	-	-	-
FE160 and FE250	125	125	121	118	114	110	106	103	118	114	110	107	103	100	96
	160	160	155	150	146	141	136	131	150	146	141	137	132	128	123
	200	200	194	188	182	176	170	164	188	182	177	171	165	160	154
	250	250	243	235	228	220	213	205	235	228	221	214	207	200	193
FK800 and FK1250	630	630	611	592	573	554	536	517	630	611	563	545	527	509	491
	800	800	776	752	728	704	680	656	800	760	714	692	669	646	623
	1000	1000	970	940	910	880	850	820	1000	950	893	865	836	808	779
	1250	1250	1213	1175	1138	1100	1063	1025	1250	1188	1116	1081	1045	1009	974
FD63 and FD160 FE160 and FE250 with RCD	16	16.0	15.5	15.0	14.6	14.1	13.6	13.1	15.0	14.6	14.1	13.7	13.2	12.8	12.3
	25	25.0	24.3	23.5	22.8	22.0	21.3	20.5	23.5	22.8	22.1	21.4	20.7	20.0	19.3
	32	32.0	31.0	30.1	29.1	28.2	27.2	26.2	30.1	29.2	28.3	27.4	26.5	25.6	24.7
	40	40.0	38.8	37.6	36.4	35.2	34.0	32.8	37.6	36.5	35.3	34.2	33.1	32.0	30.8
	50	50.0	48.5	47.0	45.5	44.0	42.5	41.0	47.0	45.6	44.2	42.8	41.4	40.0	38.5
	63	63.0	61.1	59.2	57.3	55.4	53.6	51.7	59.2	57.4	55.7	53.9	52.1	50.3	48.6
	80	80.0	77.6	75.2	72.8	70.4	68.0	65.6	75.2	72.9	70.7	68.4	66.2	63.9	61.7
	100	100	97.0	94.0	91.0	88.0	85.0	82.0	94.0	91.2	88.4	85.5	82.7	79.9	77.1
FD160 with RCD	125	119	115	110	108	97	101	97	110	107	104	101	97	94	91
	160	152	147	141	138	125	129	125	141	137	133	129	124	120	116
FE160 and FE250 with RCD	125	125	121	118	114	110	106	103	118	114	110	107	103	100	96
	160	152	147	141	138	125	129	125	141	137	133	129	124	120	116
	200	190	184	177	173	156	162	156	177	171	166	161	156	150	145
	250	238	230	221	216	195	202	195	221	214	208	201	194	188	181

Electronic trip units

Electronic trip units are less sensitive to fluctuations in ambient temperature than thermal magnetic trip units. However, to prevent the device and its environment from exceeding their design values, certain limits must be taken into account.

The table indicates the maximum values to which the LT or overload protection of the electronic trip unit of the Record Plus™ breaker can be set. This at ambient temperatures from 40 to 70°C.

Maximum permissible current at an ambient temperature

Type	Fixed breaker								Plug in or drawout breaker						
	Is[1](A)	40°C	45°	50°C	55°C	60°C	65°C	70°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
FE160	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
	160	160	160	160	156	152	148	144	160	156	152	148	144	140	136
FE250	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
	160	160	160	160	160	160	160	160	160	156	152	148	144	140	136
	250	250	250	250	244	238	231	225	250	244	238	231	225	219	213
FG400	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	350	350	350	350	350	350	350	350	350	350	350	350	350	350	340
	400	400	400	400	390	380	370	360	400	390	380	370	360	350	340
FG630	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	500	500	500	500	500	500	500	500	500	500	500	500	500	500	481
	630	630	614	599	583	567	551	536	583	568	554	539	524	510	481
FK800	800	800	800	760	760	760	680	-	760	741	722	703	722	646	-
FK1250	1000	1000	1000	950	950	900	850	-	950	950	903	879	855	808	-
	1250	1250	1250	1188	1188	1125	1000	-	1188	1158	1128	1098	1069	950	-
FK1600	1600	1600	1600	1520	1440	1408	1280	-	1600	1536	1444	1408	1368	1216	-
FE160 with RCD	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	125	125	125	125	125	125	125	125	125	125	125	125	125	125	106
	160	160	156	152	148	144	141	137	152	148	144	141	137	133	129
FE250 with RCD	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
	250	250	244	238	244	238	231	225	238	232	226	220	214	208	202
FG400 with RCD	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	350	350	350	350	341	333	324	315	350	351	342	333	324	315	306
	400	400	370	360	350	340	330	320	360	351	342	333	324	315	306
FG630 with RCD	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	500	500	500	500	500	500	500	488	500	500	494	481	468	455	442
	630	630	567	551	536	520	504	488	520	507	494	481	468	455	442

Derating tables for disconnectors Dilos

Derating tables for Dilos

			Dilos 00	Dilos 00	Dilos 00	Dilos 00	Dilos 0	Dilos 0	Dilos 0
Conventional enclosed thermal current Ithe = Ith		(A)	**16**	**25**	**32**	**40**	**32**	**40**	**63**
Number of poles			3	3	3	3	2/3/4	2/3/4	2/3/4
Frequency		(Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated thermal current at	40°C	(A)	16	25	32	40	32	40	63
	50°C	(A)	16	25	32	40	32	40	63
	60°C	(A)	16	25	32	40	32	40	63
Power loss per pole		(W)	0.12	0.35	0.6	1	0.6	1	1.6
Terminal capacity (Cu)	minimum	(mm²)	1.5	1.5	1.5	1.5	2.5	2.5	2.5
	maximum	(mm²)	16	16	16	16	25	25	25

			Dilos 1	Dilos 1	Dilos 1	Dilos 1	Dilos 1
Conventional enclosed thermal current Ithe = Ith		(A)	**40**	**63**	**80**	**100**	**125**
Number of poles			2/3/4	2/3/4	2/3/4	2/3/4	2/3/4
Frequency		(Hz)	50/60	50/60	50/60	50/60	50/60
Rated thermal current at	40°C	(A)	40	63	80	100	125
	50°C	(A)	40	63	80	100	125
	60°C	(A)	40	63	80	100	125
Power loss per pole		(W)	0.48	1.2	1.84	2.9	4.5
Terminal capacity (Cu)	minimum	(mm²)	6	6	6	6	6
	maximum	(mm²)	50	50	50	50	50

			Dilos 2	Dilos 2	Dilos 1H	Dilos 1H	Dilos 1H
Conventional enclosed thermal current Ithe = Ith		(A)	**160**	**200**	**40**	**63**	**125**
Number of poles			2/3/4	2/3/4	3/4	3/4	3/4
Frequency		(Hz)	50/60	50/60	50/60	50/60	50/60
Rated thermal current at	40°C	(A)	160	200	40	63	125
	50°C	(A)	160	200	40	63	125
	60°C	(A)	160	200	40	63	125
Power loss per pole		(W)	6.5	10	0.9	2.2	8.5
Terminal capacity (Cu)	minimum	(mm²)	Cu-rail	Cu-rail	6	6	6
	maximum	(mm²)	20x6	20x6	50	50	50

			Dilos 3	Dilos 3	Dilos 3	Dilos 3	Dilos 4	Dilos 4	Dilos 4
Conventional enclosed thermal current Ithe = Ith		(A)	**160**	**200**	**250**	**315**	**400**	**500**	**630**
Number of poles			3/4	3/4	3/4	3/4	3/4	3/4	3/4
Frequency		(Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated thermal current at	40°C	(A)	160	200	250	315	400	500	630
	50°C	(A)	160	200	250	315	400	500	630
	60°C	(A)	160	200	250	315	400	500	630
Power loss per pole		(W)	3	4.8	7.5	12	10.5	16	26
Terminal capacity (Cu)	minimum	(mm²)	Cu-rail	Cu-rail	Cu-rail	Cu-rail	Cu-rail	Cu-rail	Cu-rail
	maximum	(mm²)	30x6	30x6	30x6	30x6	40x6	40x6	40x6

Watt loss and current ratings at temperatures >50°C

Standards
The standard for low voltage equipment is defined in the IEC 61439-2, the EN 50298 and the IEC 60890. These provide a theoretical method to calculate the temperature rise within an enclosure. The main element in these calculations is the power dissipation of the equipment installed. By totalizing this value for all the installed devices, connections, cables and busbars it is possible to calculate the temperature rise within the enclosure. For normal applications a temperature rise within the enclosure of 50 Kelvin is assumed.

Use
An enclosure manufacturer can provide the exact data on the allowable power dissipation within a certain enclosure. The values depend on the enclosure type, the ventilation it offers and where the components are located within this enclosure.

EntelliGuard™ Power Circuit breakers
The devices have been designed to offer the lowest, feasible heat dissipation value and the highest possible current ratings when enclosed. The tables here indicate the heat dissipation values and current ratings at temperatures within the direct vicinty of the breaker in free air.
The values apply for breakers used with rear connections and the preferred **vertical busbars**. The recommended connection cross sections and busbar sizes can be found on page D.2 of the EntelliGuard catalogue.

Breaker type 'Automatic'	Switch type 'Non Automatic'	Envelope	In in A	Power loss at In per pole (W)	Temperature in the direct environment of the EntelliGuard				
					≤50°C	55°C	60°C	65°C	70°C
					Maximum user current Ie in A Vertical connection mode: Fixed pattern				
GG04 S, N and H	GJ04S and GW04N	1	400	2.29	400	400	400	400	400
GG04 E and M	GJ04H	2	400	1.66	400	400	400	400	400
GG07 S, N and H	GJ07S and GW07N	1	630	5.68	630	630	630	630	630
GG07 E and M	GJ07H	2	630	4.13	630	630	630	630	630
GG08 S, N and H	GJ08S and GW08N	1	800	9.15	800	800	800	800	800
GG08 E and M	GJ08H	2	800	6.66	800	800	800	800	800
GG10 S, N and H	GJ10S and GW10N	1	1000	14.3	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	10.4	1000	1000	1000	1000	1000
GG13 S, N and H	GJ13S and GW13N	1	1250	22.3	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	16.3	1250	1250	1250	1250	1250
GG16 S, N and H	GJ16S and GW16N	1	1600	36.6	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	26.6	1600	1600	1600	1600	1600
GG20 S, N and H	GJ20S and GW20N	1	2000	57.2	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	41.6	2000	2000	2000	2000	2000
GG25 N, H, and M	GJ25N and GW25H	2	2500	65.0	2500	2500	2500	2500	2500
GG32 N, H, and M	GJ32N and GW32H	2	3200	106	3200	3200	3200	3150	3100
GG32 G and L	GJ32G	3	3200	66.6	3200	3200	3200	3200	3200
GG40 N, H, and M	GJ40N and GW40H	2	4000	166	4000	3750	3600	3500	3400
GG40 G and L	GJ40G	3	4000	104	4000	4000	4000	4000	4000
GG50 M and L	GJ50L	3	5000	163	5000	5000	5000	4900	4800
GG64 M and L	GJ64L	3	6400	266	6400	6300	6200	6100	6000
					Maximum user current Ie in A Vertical connection mode: Draw-out pattern				
GG04 S, N and H	GJ04S and GW04N	1	400	4.78	400	400	400	400	400
GG04 E and M	GJ04H	2	400	3.74	400	400	400	400	400
GG07 S, N and H	GJ07S and GW07N	1	630	11.9	630	630	630	630	630
GG07 E and M	GJ07H	2	630	9.29	630	630	630	630	630
GG08 S, N and H	GJ08S and GW08N	1	800	19.1	800	800	800	800	800
GG08 E and M	GJ08H	2	800	15.0	800	800	800	800	800
GG10 S, N and H	GJ10S and GW10N	1	1000	29.9	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	23.4	1000	1000	1000	1000	1000
GG13 S, N and H	GJ13S and GW13N	1	1250	46.7	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	36.6	1250	1250	1250	1250	1250
GG16 S, N and H	GJ16S and GW16N	1	1600	76.5	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	59.9	1600	1600	1600	1600	1600
GG20 S, N and H	GJ20S and GW20N	1	2000	120	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	93.6	2000	2000	2000	2000	2000
GG25 N H and M	GJ25N and GW25H	2	2500	146	2500	2500	2500	2500	2500
GG32 N, H and M	GJ32N and GW32H	2	3200	240	3200	3200	3200	3100	3000
GH32 N, H and M	GK32N and GZ32H	2	3200	186	3200	3200	3200	3200	3200
GG32 G and L	GJ32G	3	3200	106	3200	3200	3200	3200	3200
GG40 N, H and M	GJ40N and GW40H	2	4000	374	3800	3700	3600	3500	3400
GH40 N, H and M	GK40N and GZ40H	2	4000	291	4000	3950	3900	3835	3750
GG40 G and L	GJ40G	3	4000	166	4000	4000	4000	4000	4000
GG50 M and L	GJ50L	3	5000	260	5000	5000	5000	4900	4800
GG64 M and L	GJ64L	3	6400	426	6400	6300	6200	6100	6000

Watt loss and current ratings at temperatures >50°C

EntelliGuard™ Power Circuit breakers

Other connection modes as rear connection with horizontal busbars and connection from the breaker front are possible. The tables here indicate the heat dissipation values and current ratings at temperatures within the direct vicinty of the breaker in free air.

The values apply for breakers used in rear connection mode with **horizontal busbar** connection and for devices with front connection.

The recommended connection cross sections and busbar sizes can be found on page D.2 of the EntelliGuard catalogue.

Breaker type 'Automatic'	Switch type 'Non Automatic'	Envelope	In in A	Power loss at In per pole (W)	Temperature in the direct environment of the EntelliGuard				
					≤50°C	55°C	60°C	65°C	70°C
					Maximum user current Ie in A Horizontal or Front[2] connection mode: Fixed pattern				
GG04 S, N and H	GJ04S and GW04N	1	400	2.29	400	400	400	400	400
GG04 E and M	GJ04H	2	400	1.66	400	400	400	400	400
GG07 S, N and H	GJ07S and GW07N	1	630	5.68	630	630	630	630	630
GG07 E and M	GJ07H	2	630	4.13	630	630	630	630	630
GG08 S, N and H	GJ08S and GW08N	1	800	9.15	800	800	800	800	800
GG08 E and M	GJ08H	2	800	6.66	800	800	800	800	800
GG10 S, N and H	GJ10S and GW10N	1	1000	14.3	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	10.4	1000	1000	1000	1000	1000
GG13 S, N and H	GJ13S and GW13N	1	1250	22.3	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	16.3	1250	1250	1250	1250	1250
GG16 S, N and H	GJ16S and GW16N	1	1600	36.6	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	26.6	1600	1600	1600	1600	1600
GG20 S, N and H	GJ20S and GW20N	1	2000	57.2	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	41.6	2000	2000	2000	2000	2000
GG25 N, H and M	GJ25N and GW25H	2	2500	65.0	2500	2500	2500	2500	2500
GG32 N, H and M	GJ32N and GW32H	2	3200	106	3200	3200	3100	3050	3000
GG32 G and L	GJ32G	3	3200	66.6	3200	3200	3200	3200	3200
GG40 N, H and M-RH	GJ40N and GW40H-RH	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40 N, H and M-FC	GJ40N and GW40H-FC	2	4000	166	4000	3700	3400	3200	3000
GG40 G and L	GJ40G	3	4000	104	4000	4000	4000	4000	4000
GG50 M and L	GJ50L	3	5000	163	5000	5000	5000	4875	4750
GG64 M and L	GJ64L	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)
					Maximum user current Ie in A Horizontal or Front[2] connection mode: Draw-out pattern				
GG04 S, N and H	GJ04S and GW04N	1	400	4.8	400	400	400	400	400
GG04 E and M	GJ04H	2	400	3.74	400	400	400	400	400
GG07 S, N and H	GJ07S and GW07N	1	630	11.9	630	630	630	630	630
GG07 E and M	GJ07H	2	630	9.3	630	630	630	630	630
GG08 S, N and H	GJ08S and GW08N	1	800	19.1	800	800	800	800	800
GG08 E and M	GJ08H	2	800	15.0	800	800	800	800	800
GG10 S, N and H	GJ10S and GW10N	1	1000	29.9	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	23.4	1000	1000	1000	1000	1000
GG13 S, N and H	GJ13S and GW13N	1	1250	47	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	36.6	1250	1250	1250	1250	1250
GG16 S, N and H	GJ16S and GW16N	1	1600	77	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	60	1600	1600	1600	1600	1600
GG20 S, N and H	GJ20S and GW20N	1	2000	120	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	94	2000	2000	2000	2000	2000
GG25 N, H and M	GJ25N and GW25H	2	2500	146	2500	2500	2500	2500	2500
GG32 N, H and M	GJ32N and GW32H	2	3200	240	3200	3200	3200	3200	2900
GH32 N, H and M	GK32N and GZ32H	2	3200	186	3200	3200	3200	3200	3000
GG32 G and L	GJ32G	3	3200	106	3200	3200	3200	3200	3200
GG40 N, H and M-RH	GJ40N and GW40H-RH	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40 N, H and M-FC	GJ40N and GW40H-FC	2	4000	374	4000	3700	3400	3200	3000
GH40 N, H and M	GK40N and GZ40H	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40 G and L	GJ40G	3	4000	166	4000	4000	4000	4000	4000
GG50 M and L	GJ50L	3	5000	260	5000	5000	5000	4850	4700
GG64 M and L	GJ64L	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(1) Rear horizontal connections cannot be used at this current rating

(2) Front connections are available for the standard envelope 1 and envelope 2 types (not available for GH,GK and GZ types)

Power losses RCCBs and RCBOs Series ElfaPlus

The power losses are calculated by measuring the voltage drop between the incoming and the outgoing terminals of the device at rated current.

Power losses

In (A)	Z (mOhm)	Power losses in Watt 1P	2P	3P	3P+N
0.5	4458.00	1.12	2.23	3.35	3.35
1	1272.00	1.27	2.54	3.82	3.82
2	310.00	1.24	2.48	3.72	3.72
3	173.00	1.56	3.11	4.67	4.67
4	93.00	1.49	2.98	4.46	4.46
6	43.60	1.57	3.14	4.71	4.71
8	19.40	1.24	2.48	3.73	3.73
10	15.60	1.56	3.12	4.68	4.68
13	11.90	2.01	4.02	6.03	6.03
16	10.10	2.59	5.17	7.76	7.76
20	6.90	2.76	5.52	8.28	8.28
25	5.10	3.19	6.38	9.56	9.56
32	3.00	3.07	6.14	9.22	9.22
40	2.50	4.00	8.00	12.00	12.00
50	1.80	4.50	9.00	13.50	13.50
63	1.30	5.16	10.32	15.48	15.48
80	0.90	6.00	12.00	18.00	18.00
100	0.75	7.50	15.00	22.50	22.50
125	0.60	9.50	19.00	28.50	28.50

RCBO - Series DP

RCBO In (A)	Z (mOhm)	Power losses in Watt 2P
4	125	4.00
6	53	3.80
10	16.5	3.20
13	11.9	4.00
16	9.8	5.00
20	7.1	5.60
25	5.6	7.00
32	4.7	9.60
40	3.6	11.60

RCBO - Series DPE

RCBO In (A)	Z (mOhm)	Power losses in Watt
6	45.8	1.65
10	16.4	1.70
13	12.5	2.10
16	10.6	2.70
20	7.3	2.90
25	5.4	3.30
32	3.2	3.40
40	2.6	4.20
50	1.9	4.80
63	1.4	5.60

RCCB - Series FP

RCCB In (A)	Z (mOhm)	Power losses in Watt 2P	3P+N
16	9.95	5.10	7.65
25	3.75	4.66	6.99
40	2.15	6.86	10.29
63	1.30	10.32	15.48
80	1.3	16.60	24.90
100	0.9	17.40	26.10

Coupled MCB Series EP with add-on RCD

RCBO In (A)	Z (mOhm)	Power losses in Watt 2P	3P	3P+N
6	45.4	3.20	4.80	4.80
10	17.4	3.40	5.10	5.10
13	13.7	4.60	6.90	6.90
16	11.9	6.00	9.00	9.00
20	8.7	7.00	10.50	10.50
25	6.9	8.60	12.90	12.90
32	4.8	9.80	14.70	14.70
40	3.6	11.60	17.40	17.40
50	2.9	14.60	21.90	21.90
63	2.4	19.20	28.80	28.80

Notes

Power losses Record Plus™

Power dissipation

The power dissipation tables included here indicate the DC resistance of the Record Plus™ breakers in cold condition. The power dissipation per pole can be calculated with this value and the average current flowing within the circuit (formula I2R). The tables indicate the Watt loss per pole based on the maximum current load of the breaker. To calculate the total Watt loss for a three or four pole breaker these values are multiplied by three.*

* for circuits with a high 3rd harmonic content, please contact us

Power dissipation - FD160 frame ≤ 63A

		Thermal magn. type (LTM, LTMD, GTM)							Mag Break™ (MO)						Switch (Y)
	In (A)[1]	16	20	25	32	40	50	63	3	7	13	20	30	50	63
Fixed version	R in mΩ per pole	10.00	6.50	4.00	2.50	2.00	1.60	1.40	200.00	55.00	18.00	1.20	1.20	0.53	0.50
	Dissipation Watt single pole	2.56	2.60	2.50	2.56	3.20	4.00	5.56	1.80	2.70	2.81	0.48	1.08	1.33	1.98
	Dissipation Watt three poles	7.68	7.80	7.50	7.68	9.60	12.00	16.67	5.40	8.09	8.44	1.44	3.24	3.98	5.95
Plug-in version	R in mΩ per pole	10.07	6.57	4.07	2.57	2.07	1.67	1.47	200.07	55.07	18.07	1.27	1.27	0.60	0.57
	Dissipation Watt single pole	2.58	2.63	2.54	2.63	3.31	4.18	5.83	1.80	2.70	2.82	0.51	1.14	1.50	2.26
	Dissipation Watt three poles	7.73	7.88	7.63	7.90	9.94	12.53	17.50	5.40	8.10	8.47	1.52	3.43	4.50	6.79
Fixed version with RCD	R in mΩ per pole	10.08	6.58	4.08	2.58	2.08	1.68	1.48	200.08	55.08	18.08	1.28	1.28	0.61	0.58
	Dissipation Watt single pole	2.58	2.63	2.55	2.64	3.33	4.20	5.87	1.80	2.70	2.83	0.51	1.15	1.53	2.30
	Dissipation Watt three poles	7.74	7.90	7.65	7.93	9.98	12.60	17.62	5.40	8.10	8.48	1.54	3.46	4.58	6.91
Plug-in version with RCD	R in mΩ per pole	10.15	6.65	4.15	2.65	2.15	1.75	1.55	200.15	55.15	18.15	1.35	1.35	0.68	0.65
	Dissipation Watt single pole	2.60	2.66	2.59	2.71	3.44	4.38	6.15	1.80	2.70	2.84	0.54	1.22	1.70	2.58
	Dissipation Watt three poles	7.80	7.98	7.78	8.14	10.32	13.13	18.46	5.40	8.11	8.51	1.62	3.65	5.10	7.74

Power dissipation - FD160 frame > 63A

		Thermal magn. type (LTM, LTMD, GTM)						Mag Break™ (MO)			Switch (Y)
	In (A)			80	100	125	160		80	100	160
Fixed version	R in mΩ per pole			0.85	0.75	0.53	0.53		0.53	0.53	0.50
	Dissipation Watt single pole			5.44	7.50	8.28	13.57		3.39	5.30	12.80
	Dissipation Watt three poles			16.32	22.50	24.84	40.70		10.18	15.90	38.40
Plug-in version	R in mΩ per pole			0.92	0.82	0.60	0.60		0.60	0.60	0.57
	Dissipation Watt single pole			5.89	8.20	9.38	15.36		3.84	6.00	14.59
	Dissipation Watt three poles			17.66	24.60	28.13	46.08		11.52	18.00	43.78
Fixed version with RCD	R in mΩ per pole			0.93	0.83	0.61	0.61		0.61	0.61	0.58
	Dissipation Watt single pole			5.95	8.30	9.53	15.62		3.90	6.10	14.85
	Dissipation Watt three poles			17.86	24.90	28.59	46.85		11.71	18.30	44.54
Plug-in version with RCD	R in mΩ per pole			1.00	0.90	0.68	0.68		0.68	0.68	0.65
	Dissipation Watt single pole			6.40	9.00	10.63	17.41		4.35	6.80	16.64
	Dissipation Watt three poles			19.20	27.00	31.88	52.22		13.06	20.40	49.92

Power dissipation - FE160 frame

		Thermal magn. type (LTMD, GTM)									Switch (Y)
	In (A)	25	32	40	50	63	80	100	125	160	160
Fixed version	R in mΩ per pole	6.30	2.80	2.80	2.10	1.45	1.20	0.81	0.77	0.63	0.40
	Dissipation Watt single pole	3.94	2.87	4.48	5.25	5.76	7.68	8.10	12.03	16.00	10.24
	Dissipation Watt three poles	11.81	8.60	13.44	15.75	17.27	23.04	24.30	36.09	48.00	30.72
Plug-in version	R in mΩ per pole	6.37	2.87	2.87	2.17	1.52	1.27	0.88	0.84	0.70	0.47
	Dissipation Watt single pole	3.98	2.94	4.59	5.43	6.03	8.13	8.80	13.13	17.79	12.03
	Dissipation Watt three poles	11.94	8.82	13.78	16.28	18.10	24.38	26.40	39.38	53.38	36.10
Fixed version with RCD	R in mΩ per pole	6.38	2.88	2.88	2.18	1.53	1.28	0.89	0.85	0.71	0.48
	Dissipation Watt single pole	3.99	2.95	4.61	5.45	6.07	8.19	8.90	13.28	18.05	12.29
	Dissipation Watt three poles	11.96	8.85	13.82	16.35	18.22	24.58	26.70	39.84	54.14	36.86
Plug-in version with RCD	R in mΩ per pole	6.45	2.95	2.95	2.25	1.60	1.35	0.96	0.92	0.78	0.55
	Dissipation Watt single pole	4.03	3.02	4.72	5.63	6.35	8.64	9.60	14.38	19.84	14.08
	Dissipation Watt three poles	12.09	9.06	14.16	16.88	19.05	25.92	28.80	43.13	59.52	42.24

		Mag BreakTM (MO)										FE160 frame electronic type (SMR1)			
	In (A)[1]	3	7	13	20	30	50	80	100	125	160	25	63	125	160
Fixed version	R in mΩ per pole	410.00	110.00	13.30	13.20	3.60	1.70	0.60	0.60	0.40	0.40	0.40	0.40	0.40	0.40
	Dissipation Watt single pole	3.69	5.39	2.08	5.28	3.24	4.25	3.84	6.00	6.25	6.25	0.25	0.25	1.59	6.25
	Dissipation Watt three poles	11.07	16.17	6.23	15.84	9.72	12.75	11.52	18.00	18.75	18.75	0.75	0.75	4.76	18.75
Plug-in version	R in mΩ per pole	410.07	110.07	13.37	13.27	3.67	1.77	0.67	0.67	0.47	0.47	0.47	0.47	0.47	0.47
	Dissipation Watt single pole	3.69	5.39	2.09	5.31	3.30	4.43	4.29	6.70	7.34	7.34	0.29	0.29	1.87	7.34
	Dissipation Watt three poles	11.07	16.18	6.27	15.92	9.91	13.28	12.86	20.10	22.03	22.03	0.88	0.88	5.60	22.03
Fixed version with RCD	R in mΩ per pole	410.08	110.08	13.38	13.28	3.68	1.78	0.68	0.68	0.48	0.48	0.48	0.48	0.48	0.48
	Dissipation Watt single pole	3.69	5.39	2.09	5.31	3.31	4.45	4.35	6.80	7.50	7.50	0.30	0.30	1.91	7.50
	Dissipation Watt three poles	11.07	16.18	6.27	15.94	9.94	13.35	13.06	20.40	22.50	22.50	0.90	0.90	5.72	22.50
Plug-in version with RCD	R in mΩ per pole	410.15	110.15	13.45	13.35	3.75	1.85	0.75	0.75	0.55	0.55	0.55	0.55	0.55	0.55
	Dissipation Watt single pole	3.69	5.40	2.10	5.34	3.38	4.63	4.80	7.50	8.59	8.59	0.34	0.34	2.18	8.59
	Dissipation Watt three poles	11.07	16.19	6.30	16.02	10.13	13.88	14.40	22.50	25.7	25.78	1.03	1.03	6.55	25.78

(1) All 3A magnetic only ratings can be used at 3.5A

Power dissipation - FE250 frame

		Thermal magn. type (LTMD, GTM)				Switch (Y)
	In (A)	125	160	200	250	250
Fixed version	R in mΩ per pole	0.67	0.53	0.40	0.33	0.30
	Dissipation Watt single pole	10.47	13.57	16.00	20.63	18.75
	Dissipation Watt three poles	31.41	40.70	48.00	61.88	56.25
Plug-in version	R in mΩ per pole	0.73	0.59	0.46	0.39	0.36
	Dissipation Watt single pole	11.41	15.10	18.40	24.38	22.50
	Dissipation Watt three poles	34.22	45.31	55.20	73.13	67.50
Fixed version with RCD	R in mΩ per pole	0.74	0.60	0.47	0.40	0.37
	Dissipation Watt single pole	11.56	15.36	18.80	25.00	23.13
	Dissipation Watt three poles	34.69	46.08	56.40	75.00	69.38
Plug-in version with RCD	R in mΩ per pole	0.80	0.66	0.53	0.46	0.43
	Dissipation Watt single pole	12.50	16.90	21.20	28.75	26.88
	Dissipation Watt three poles	37.50	50.69	63.60	86.25	80.63

		Mag Break™(MO)			FE250 frame Electronic type (SMR1)		
	In (A)	160	200	250	125	160	250
Fixed version	R in mΩ per pole	0.33	0.33	0.33	0.30	0.30	0.30
	Dissipation Watt single pole	8.45	13.20	20.63	4.69	7.68	18.75
	Dissipation Watt three poles	25.34	39.60	61.88	14.06	23.04	56.25
Plug-in version	R in mΩ per pole	0.39	0.39	0.39	0.36	0.36	0.36
	Dissipation Watt single pole	9.98	15.60	24.38	5.63	9.22	22.50
	Dissipation Watt three poles	29.95	46.80	73.13	16.88	27.65	67.50
Fixed version with RCD	R in mΩ per pole	0.40	0.40	0.40	0.37	0.37	0.37
	Dissipation Watt single pole	10.24	16.00	25.00	5.78	9.47	23.13
	Dissipation Watt three poles	30.72	48.00	75.00	17.34	28.42	69.38
Plug-in version with RCD	R in mΩ per pole	0.46	0.46	0.46	0.43	0.43	0.43
	Dissipation Watt single pole	11.78	18.40	28.75	6.72	11.01	26.88
	Dissipation Watt three poles	35.33	55.20	86.25	20.16	33.02	80.63

Power dissipation - FG400 and FG 630 frame

		FG400/630 frame electronic type (SMR1 and 2)				Mag Break™ (MO)		Switch (Y)	
	In (A)	250	400	500	630	400	500	400	630
Fixed version	R in mΩ per pole	0.11	0.11	0.10	0.10	0.10	0.10	0.11	0.10
	Dissipation Watt single pole	6.88	17.60	25.00	39.69	39.69	23.75	17.60	39.69
	Dissipation Watt three poles	20.63	52.80	75.00	119.07	119.07	71.25	52.80	119.07
Plug-in/Drawout version	R in mΩ per pole	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.12
	Dissipation Watt single pole	8.13	20.80	30.00	47.63	47.63	30.00	20.80	47.63
	Dissipation Watt three poles	24.38	62.40	90.00	142.88	142.88	90.00	62.40	142.88
Fixed version with RCD	R in mΩ per pole	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.15
	Dissipation Watt single pole	10.00	25.60	37.50	59.54	59.54	37.50	25.60	59.54
	Dissipation Watt three poles	30.00	76.80	112.50	178.61	178.61	112.50	76.80	178.61
Plug-in/Drawout version with RCD	R in mΩ per pole	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
	Dissipation Watt single pole	10.31	26.40	41.25	65.49	65.49	41.25	26.40	65.49
	Dissipation Watt three poles	30.94	79.20	123.75	196.47	196.47	123.75	79.20	196.47

Power dissipation - FK800, FK1250 and FK1600 frame

		Thermal magn. type (LTM)				Mag Break™ (MO)		Switch (Y)		
	In (A)	630	800	1000	1250	800	1250	800	1250	1600
Fixed version	R in mΩ per pole	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.01
	Dissipation Watt single pole	15.88	25.60	35.00	54.69	12.80	23.44	12.80	31.25	25.60
	Dissipation Watt three poles	47.63	76.80	105.00	164.06	38.40	70.31	38.40	93.75	76.80
Draw-out version	R in mΩ per pole	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.05	0.04
	Dissipation Watt single pole	27.78	44.80	65.00	101.56	32.00	70.31	32.00	78.13	102.40
	Dissipation Watt three poles	83.35	134.40	195.00	304.69	96.00	210.94	96.00	234.38	307.20

		FK800,1250-1600 frame electronic type (SMR1e, s and g)			
	In (A)	800	1000	1250	1600
Fixed version	R in mΩ per pole	0.04	0.04	0.04	0.03
	Dissipation Watt single pole	25.60	35.00	54.69	76.80
	Dissipation Watt three poles	76.80	105.00	164.06	230.40
Draw-out version	R in mΩ per pole	0.07	0.07	0.07	0.06
	Dissipation Watt single pole	25.60	35.00	54.69	76.80
	Dissipation Watt three poles	76.80	105.00	164.06	230.40

Power losses ACBs M-PACT Plus™ and EntelliGuard™

Power dissipation

The power dissipation tables included here indicate the DC resistance of the M-PACT Plus™ and EntelliGuard™ breakers in cold condition.

The power dissipation per pole can be calculated with this value and the average current flowing within the circuit (formula $I^{2}R$). The tables indicate the Watt loss per pole based on the maximum current load of the breaker.

Power losses M-PACT Plus™ and EntelliGuard™

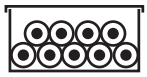
Current	M-PACT Plus™				EntelliGuard™			
	Breaker type		Power loss in Watt		Breaker type		Power loss in Watt	
In (A)	Frame	Type	Fixed	Withdrawable	Frame	Type	Fixed	Withdrawable
400	1	S	16	33	1	S/N/H	7	14
400	1	N	11	22	2	E	5	11
630	1	S	39	75	1	S/N/H	17	36
630	1	N	27	53	2	E	12	28
800	1	S	63	127	1	S/N/H	27	57
800	1	N	43	86	-	-	-	-
800	2	H	23	49	2	E	20	45
1000	1	S	106	211	1	S/N/H	43	90
1000	1	N	68	135	-	-	-	-
1000	2	H	36	77	2	E	31	70
1250	1	S	175	351	1	S/N/H	67	141
1250	1	N	105	211	-	-	-	-
1250	2	H	60	128	2	E	49	110
1600	1	S	287	574	1	S/N/H	110	231
1600	1	N	196	392	-	-	-	-
1600	2	H	98	209	2	E	80	180
2000	1	S/N	224	490	1	S/N/H	172	360
2000	2	S/N	224	490	-	-	-	-
2000	2	H	163	347	2	E	125	282
2500	1	S/N	224	490	-	-	-	-
2500	2	S/N	224	490	2	N/H	195	438
2500	2	H	163	347	-	-	-	-
3200	2	S/N/H	418	888	2	N/H	318	720
3200	-	-	-	-	2	N/H	-	558
4000	2	S/N/H	571	1224	2	N/H	498	1122
4000	-	-	-	-	2	N/H	-	873

Operating current and power loss of copper conductors

The following tables provide guidance values for conductor operating currents and power losses under ideal conditions within an ASSEMBLY. The calculation methods used to establish these values are given to enable values to be calculated for other conditions.

Table 1 - Operating current and power loss of single-core copper cables with a permissible conductor temperature of 70°C (ambient temperature inside the ASSEMBLY: 55°C)

Table 1: Conductor currents and power losses according IEC 61439-1

Conductor arrangement	 Single-core cables in a cable trunking on a wall, run horizontally. 6 of the cables (2 three-phase circuits) continuously loaded		 Single-core cables, touching free in air or on a perforated tray. 6 cables (2 three-phase circuits) continuously loaded		Spacing at least one cable diameter  Single-core cables, spaced horizontally in free air	
Crosssectional area of conductor (mm²)	Resistance of conductor at 20°C, R_{20} a) (mΩ/m)	Max. operating current Imax b) (A)	Power losses per conductor P_V (W/m)	Max. operating current Imax c) (A)	Power losses per conductor P_V (W/m)	Max. operating current Imax d) (A)	Power losses per conductor P_V (W/m)
1.5	12.1	8	0.8	9	1.3	15	3.2
2.5	7.41	10	0.9	13	1.5	21	3.7
4	4.61	14	1.0	18	1.7	28	4.2
6	3.08	18	1.1	23	2.0	36	4.7
10	1.83	24	1.3	32	2.3	50	5.4
16	1.15	33	1.5	44	2.7	67	6.2
25	0.727	43	1.6	59	3.0	89	6.9
35	0.524	54	1.8	74	3.4	110	7.7
50	0.387	65	2.0	90	3.7	134	8.3
70	0.268	83	2.2	116	4.3	171	9.4
95	0.193	101	2.4	142	4.7	208	10.0
120	0.153	117	2.5	165	5.0	242	10.7
150	0.124			191	5.4	278	11.5
185	0.0991			220	5.7	318	12.0
240	0.0754			260	6.1	375	12.7

$$I\text{max} = I_{30} \times k_1 \times k_2 \qquad P_V = I^2\text{max} \times R_{20} \times [1 + \alpha \times (T_C - 20°)]$$

k_1 Reduction factor for air temperature inside the enclosure around the conductors (IEC 60364-5-52, Table A.52-14).
k_1 = 0.61 for conductor temperature 70°C, ambient temperature 55°C.
k_1 for other air temperatures: See Table H.2.
k_2 Reduction factor for groups of more than one circuit (IEC 60364-5-52, Table A.52-17).
α Temperature coefficient of resistance, α = 0.004 K^{-1}
T_C Conductor temperature

a) Values from IEC 60228, Table 2 (stranded conductors)
b) Current carrying capacity I_{30} for one three-phase circuit from IEC 60364-5-52, Table A.52-4, col. 4 (Method of installation: Item 6 in table 52-3). k_2=0.8 (item 1 in Table A.52-17, two circuits)
c) Current carrying capacity I_{30} for one three-phase circuit from IEC 60364-5-52, Table A.52-10, col. 5 (Method of installation: Item F in table A.52-1). Values for cross-sections less than 25 mm² calculated following Annex C of IEC 60364-5-52. k_2=0.88 (item 4 in Table A.52-17, two circuits)
d) Current carrying capacity I_{30} for one three-phase circuit from IEC 60364-5-52, Table A.52-10, col. 7 (Method of installation: Item G in Table A.52-1). Values for cross-sections less than 25 mm² calculated following Annex C of IEC 60364-5-52. (k_2=1)

Table 2 – Reduction factor k1 for cables with a permissible conductor temperature of 70°C (extract from IEC 60364-5-52, Table A.52-14)

Note: If the operating current in Table 2 is converted for other air temperatures using the reduction factor k1, then also the corresponding power losses must be calculated using the formula given above.

Table 2: Reduction factor k_1

Air temperature °C(1)	Reduction factor k_1
20	1.12
25	1.06
30	1.00
35	0.94
40	0.87
45	0.79
50	0.71
55	0.61
60	0.50

(1) inside the enclosure around the conductors °C

Table 3 – Operating current and power loss of bare copper busbars with rectangular cross-section, run horizontally and arranged with their largest face vertical, frequency 50 Hz to 60 Hz (ambient temperature inside the ASSEMBLY: 55°C, temperature of the conductor 70°C).

Table 3: Power losses of conductors according IEC 61439-1

Height x thickness of bars	Cross sectional area of bar	One bar per phase			Two bars per phase (spacing = thickness of bars)		
		K_3	Operating current	Powerlosses per phase conductor P_V	K_3	Operating current	Powerlosses per phase conductor P_V
(mm x mm)	(mm²)		(A)	(W/m)		(A)	(W/m)
12 × 2	23.5	1.00	70	4.5	1.01	118	6.4
15 × 2	29.5	1.00	83	5.0	1.01	138	7.0
15 × 3	44.5	1.01	105	5.4	1.02	183	8.3
20 × 2	39.5	1.01	105	6.1	1.01	172	8.1
20 × 3	59.5	1.01	133	6.4	1.02	226	9.4
20 × 5	99.1	1.02	178	7.0	1.04	325	11.9
20 × 10	199	1.03	278	8.5	1.07	536	16.6
25 × 5	124	1.02	213	8.0	1.05	381	13.2
30 × 5	149	1.03	246	9.0	1.06	437	14.5
30 × 10	299	1.05	372	10.4	1.11	689	18.9
40 × 5	199	1.03	313	10.9	1.07	543	17.0
40 × 10	399	1.07	465	12.4	1.15	839	21.7
50 × 5	249	1.04	379	12.9	1.09	646	19.6
50 × 10	499	1.08	554	14.2	1.18	982	24.4
60 × 5	299	1.05	447	15.0	1.10	748	22.0
60 × 10	599	1.10	640	16.1	1.21	1 118	27.1
80 × 5	399	1.07	575	19.0	1.13	943	27.0
80 × 10	799	1.13	806	19.7	1.27	1 372	32.0
100 × 5	499	1.10	702	23.3	1.17	1 125	31.8
100 × 10	999	1.17	969	23.5	1.33	1 612	37.1
120 × 10	1 200	1.21	1 131	27.6	1.41	1 859	43.5

$$P_V = \frac{I^2 \times k_3}{\alpha \times \kappa} \times [1 + \alpha \times (T_C - 20°)]$$

where
P_V is the power loss per metre;
I is the operating current;
k_3 is the current displacement factor;
κ is the conductivity of copper, $\kappa = 56 \frac{m}{\Omega \times mm^2}$;
A is the cross-sectional area of bar;
α is the temperature coefficient of resistance, $\alpha = 0.004\ K^{-1}$;
T_C is the temperature of the conductor.
The operating currents can be converted for other ambient air temperatures inside the ASSEMBLY and/or for a conductor temperature of 90°C by multiplying the values of Table 3 by the corresponding factor k_4 from Table 4. Then the power losses must be calculated using the formula given above accordingly.

Table 4 – Factor k_4 for different temperatures of the air inside the ASSEMBLY and / or for the conductors

Table 4: Reduction factor k_4

	Factor k_4	
Air temperature inside the enclosure around the conductors °C	**Conductor temperature of 70°C**	**Conductor temperature of 90°C**
20	2.08	2.49
25	1.94	2.37
30	1.82	2.26
35	1.69	2.14
40	1.54	2.03
45	1.35	1.91
50	1.18	1.77
55	1.00	1.62
60	0.77	1.48

It shall be considered that, dependent upon the design of the assembly, quite different ambient and busbar temperatures can occur, especially with higher operating currents. Verification of the actual temperature rise under these conditions shall be determined by test. The power losses can then be calculated by the same method as used for this Table 4. At higher currents additional eddy current losses may be significant which are not included in the values of the table.

Table 5 – Copper test conductors for rated currents up to 400A inclusive.

Table 5: according IEC 61439-1 (§ 10.10.2.3.2)

Range of rated current[1] A		Conductor cross-sectional area [2][3]	
		mm²	AWG/MCM
0	8	1.0	18
8	12	1.5	16
12	15	2.5	14
15	20	2.5	12
20	25	4.0	10
25	32	6.0	10
32	50	10	8
50	65	16	6
65	85	25	4
85	100	35	3
100	115	35	2
115	130	50	1
130	150	50	0
150	175	70	0
175	200	95	0
200	225	95	0
225	250	120	250
250	275	150	300
275	300	185	350
300	350	185	400
350	400	240	500

(1) The value of the rated current shall be greater than the first value in the first column and less than or equal to the second value in that column.
(2) For convenience of testing and with the Manufacturer's consent, smaller test conductors than those given for a stated rated current may be used.
(3) Either of the two conductors specified may be used.

Table 6 – Copper test conductors for rated currents from 400A to 4000A.

Table 6: according IEC 61439-1 (§ 10.10.2.3.2)

Range of rated current [1] A	Test conductors			
	Cables		Copper bars (2)	
	#	Cross-sectional area mm²	#	Dimensions mm (W x D)
400 to 500	2	150	2	30 x 5
500 to 630	2	185	2	40 x 5
630 to 800	2	240	2	50 x 5
800 to 1000	-	-	2	60 x 5
1000 to 1250	-	-	2	80 x 5
1250 to 1600	-	-	2	100 x 5
1600 to 2000	-	-	2	100 x 5
2000 to 2500	-	-	2	100 x 5
2500 to 3150	-	-	2	100 x 10
3150 to 4000	-	-	2	100 x 10

(1) The value of the rated current shall be greater than the first value and less than or equal to the second value.
(2) Bars are assumed to be arranged with their long faces (W) vertical. Arrangements with long faces horizontal may be used if specified by the manufacturer.

Minimum fixation torque

Device	Nm
Miniature Circuit Breakers (MCBs) ElfaPlus	3
Residual Current Devices (RCDs) ElfaPlus	4
Moulded Case Circuit Breakers (MCCBs) Record Plus FD frame	8
Moulded Case Circuit Breakers (MCCBs) Record Plus FE frame	15
Moulded Case Circuit Breakers (MCCBs) Record Plus FG frame	20
Loadbreak disconnectors Dilos 00	2.2
Loadbreak disconnectors Dilos 1	12
Loadbreak disconnectors Dilos 2 and 3	12
Loadbreak disconnectors Dilos 4	60
Wiring to copper bar 20x5 M6	4.5
Wiring to copper bar 20x10 M6	6
Wiring to copper bar 30x5 M6	4.5
Wiring to copper bar 30x10 M8	8
Copper to copper connections with M6[1]	8
Copper to copper connections with M8[1]	20
Copper to copper connections with M10[1]	40
Copper to copper connections with M12[1]	70
Copper to copper connections with M16[1]	140

(1) Bolts 8.8

Heat dissipation tables - Only valid for FORM 1

According IEC 60890, temperature rise in Kelvin

Free standing enclosure - external dimensions

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
25	-	-	2	4	2	3	2	4	2	3	2	3	2	3	2	3	2	2
50	-	-	4	6	4	5	4	7	4	5	3	5	4	6	3	5	3	4
75	-	-	6	9	5	7	6	9	5	8	5	6	5	8	5	6	4	6
100	-	-	7	11	6	9	7	12	6	9	6	8	7	10	6	8	5	7
125	-	-	8	13	7	11	9	14	8	11	7	10	8	12	7	10	6	9
150	-	-	10	15	9	13	10	16	9	13	8	11	9	14	8	11	7	10
175	-	-	11	17	10	15	12	19	10	15	9	13	11	16	9	13	8	11
200	-	-	12	19	11	16	13	21	11	17	10	14	12	18	10	14	9	12
225	-	-	14	21	12	18	14	23	12	18	11	16	13	20	11	15	10	14
250	-	-	15	23	13	20	16	25	13	20	12	17	14	22	12	17	11	15
275	-	-	16	25	14	21	17	27	14	21	13	18	15	23	13	18	12	16
300	-	-	17	27	15	23	18	29	16	23	14	20	16	25	14	19	13	17
325	-	-	18	28	16	24	19	31	17	24	15	21	18	27	15	21	13	18
350	-	-	19	30	17	26	21	33	18	26	16	22	19	28	16	22	14	20
375	-	-	21	32	18	27	22	34	19	27	17	24	20	30	17	23	15	21
400	-	-	22	34	19	29	23	36	20	29	17	25	21	31	17	25	16	22
425	-	-	23	35	20	30	24	38	21	30	18	26	22	33	18	26	17	23
450	-	-	24	37	21	31	25	40	22	32	19	27	23	35	19	27	18	24
475	-	-	25	39	22	33	26	42	22	33	20	29	24	36	20	28	18	25
500	-	-	26	40	23	34	27	43	23	35	21	30	25	38	21	29	19	26
525	-	-	27	42	24	36	28	45	24	36	22	31	26	39	22	31	20	27
550	-	-	28	43	25	37	30	47	25	37	23	32	27	41	23	32	21	28
575	-	-	29	45	26	38	31	48	26	39	23	33	28	42	23	33	21	29
600	-	-	30	47	26	40	32	50	27	40	24	34	29	44	24	34	22	30
625	-	-	31	48	27	41	33	52	28	41	25	36	30	45	25	35	23	31
650	-	-	32	50	28	42	34	53	29	43	26	37	31	46	26	36	24	32
675	-	-	33	51	29	44	35	55	30	44	27	38	32	48	27	37	24	33
700	-	-	34	53	30	45	36	57	31	45	27	39	33	49	27	39	25	34
725	-	-	35	54	31	46	37	58	32	47	28	40	33	51	28	40	26	35
750	-	-	36	56	32	47	38	60	32	48	29	41	34	52	29	41	26	36
775	-	-	37	57	32	49	39	62	33	49	30	42	35	54	30	42	27	37
800	-	-	38	59	33	50	40	63	34	50	30	43	36	55	30	43	28	38
825	-	-	39	60	34	51	41	65	35	52	31	44	37	56	31	44	28	39
850	-	-	40	62	35	53	42	66	36	53	32	46	38	58	32	45	29	40
875	-	-	41	63	36	54	43	68	37	54	33	47	39	59	33	46	30	41
900	-	-	41	65	37	55	44	69	38	55	33	48	40	60	33	47	31	42
925	-	-	42	66	37	56	45	71	38	57	34	49	41	62	34	48	31	43
950	-	-	43	67	38	57	-	-	39	58	35	50	42	63	35	49	32	44
975	-	-	44	69	39	59	-	-	40	59	36	51	42	64	36	50	33	44
1000	-	-	45	70	40	60	-	-	41	60	36	52	43	66	36	51	33	45
1025	-	-	-	-	41	61	-	-	42	62	37	53	44	67	37	52	34	46
1050	-	-	-	-	41	62	-	-	42	63	38	54	45	68	38	53	35	47
1075	-	-	-	-	42	63	-	-	43	64	39	55	46	70	39	54	35	48
1100	-	-	-	-	43	65	-	-	44	65	39	56	-	-	39	55	36	49
1125	-	-	-	-	44	66	-	-	45	66	40	57	-	-	40	56	37	50
1150	-	-	-	-	45	67	-	-	46	68	41	58	-	-	41	57	37	51
1175	-	-	-	-	45	68	-	-	47	69	41	59	-	-	41	58	38	52
1200	-	-	-	-	46	69	-	-	47	70	42	60	-	-	42	59	39	53
1225	-	-	-	-	47	70	-	-	-	-	43	61	-	-	43	60	39	53
1250	-	-	-	-	-	-	-	-	-	-	44	62	-	-	44	61	40	54
1275	-	-	-	-	-	-	-	-	-	-	44	63	-	-	44	62	40	55
1300	-	-	-	-	-	-	-	-	-	-	45	64	-	-	45	63	41	56
1325	-	-	-	-	-	-	-	-	-	-	46	65	-	-	46	64	42	57
1350	-	-	-	-	-	-	-	-	-	-	46	66	-	-	46	65	42	58
1375	-	-	-	-	-	-	-	-	-	-	47	67	-	-	47	66	43	59
1400	-	-	-	-	-	-	-	-	-	-	48	68	-	-	48	67	44	59
1425	-	-	-	-	-	-	-	-	-	-	48	69	-	-	48	68	44	60
1450	-	-	-	-	-	-	-	-	-	-	49	70	-	-	49	69	45	61
1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	70	45	62
1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	63
1525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	64
1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	65
1575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	65
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	66
1625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	67
1650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	68
1675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	69
1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	70
1725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	70
1750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Heat dissipation tables - Only valid for FORM 1

According IEC 60890, temperature rise in Kelvin

Back against the wall - external dimensions

	447x450x2155		743x450x2155		959x450x2155		447x600x2155		743x600x2155		959x600x2155		447x800x2155		743x800x2155		959x800x2155	
Watt	12 Mod		24 Mod		36 Mod		12 Mod		24 Mod		36 Mod		12 Mod		24 Mod		36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
25	-	-	2	4	2	3	3	4	2	3	2	3	2	4	2	3	2	2
50	-	-	4	7	4	6	5	7	4	6	4	5	4	6	4	5	3	4
75	-	-	6	9	6	8	6	10	6	8	5	7	6	8	5	7	4	6
100	-	-	8	11	7	10	8	13	7	10	6	9	7	11	6	8	6	7
125	-	-	9	14	8	12	10	15	8	12	8	10	9	13	7	10	7	9
150	-	-	10	16	10	14	11	17	10	14	9	12	10	15	9	12	8	10
175	-	-	12	18	11	16	13	20	11	16	10	14	11	17	10	13	9	12
200	-	-	13	20	12	18	14	22	12	18	11	15	13	19	11	15	10	13
225	-	-	14	22	13	20	16	24	13	19	12	17	14	20	12	16	11	14
250	-	-	16	24	15	21	17	26	15	21	13	18	15	22	13	18	12	16
275	-	-	17	26	16	23	18	28	16	23	14	20	16	24	14	19	13	17
300	-	-	18	28	17	25	20	30	17	24	15	21	17	26	15	20	14	18
325	-	-	19	30	18	26	21	32	18	26	16	23	19	28	16	22	14	19
350	-	-	21	31	19	28	22	34	19	28	17	24	20	29	17	23	15	20
375	-	-	22	33	20	30	23	36	20	29	18	25	21	31	18	25	16	22
400	-	-	23	35	21	31	25	38	21	31	19	27	22	33	19	26	17	23
425	-	-	24	37	22	33	26	40	22	32	20	28	23	34	20	27	18	24
450	-	-	25	39	23	34	27	42	23	34	21	29	24	36	21	28	19	25
475	-	-	26	40	24	36	28	44	24	35	22	31	25	37	21	30	20	26
500	-	-	27	42	25	37	29	46	25	37	23	32	26	39	22	31	20	27
525	-	-	29	44	26	39	31	48	26	38	24	33	27	40	23	32	21	28
550	-	-	30	45	27	40	32	50	27	40	25	35	28	42	24	33	22	29
575	-	-	31	47	28	42	33	51	28	41	26	36	29	44	25	35	23	30
600	-	-	32	49	29	43	34	53	29	43	27	37	30	45	26	36	24	31
625	-	-	33	50	30	45	35	55	30	44	27	38	31	47	27	37	24	33
650	-	-	34	52	31	46	36	57	31	46	28	39	32	48	28	38	25	34
675	-	-	35	53	32	48	38	58	32	47	29	41	33	50	29	39	26	35
700	-	-	36	55	33	49	39	60	33	48	30	42	34	51	29	40	27	36
725	-	-	37	57	34	50	40	62	34	50	31	43	35	52	30	42	27	37
750	-	-	38	58	35	52	41	64	35	51	32	44	36	54	31	43	28	38
775	-	-	39	60	36	53	42	65	36	52	33	45	37	55	32	44	29	39
800	-	-	40	61	37	55	43	67	37	54	33	47	38	57	33	45	30	40
825	-	-	41	63	38	56	44	69	38	55	34	48	39	58	34	46	30	41
850	-	-	42	64	39	57	45	70	39	57	35	49	40	60	34	47	31	42
875	-	-	43	66	40	59	-	-	40	58	36	50	41	61	35	48	32	43
900	-	-	44	67	41	60	-	-	41	59	37	51	42	62	36	50	33	44
925	-	-	45	69	42	61	-	-	42	61	38	52	43	64	37	51	33	45
950	-	-	46	70	43	63	-	-	43	62	38	54	44	65	38	52	34	46
975	-	-	-	-	43	64	-	-	44	63	39	55	45	67	38	53	35	46
1000	-	-	-	-	44	65	-	-	44	64	40	56	46	68	39	54	36	47
1025	-	-	-	-	45	67	-	-	45	66	41	57	47	69	40	55	36	48
1050	-	-	-	-	46	68	-	-	46	67	42	58	48	71	41	56	37	49
1075	-	-	-	-	47	69	-	-	47	68	42	59	-	-	41	57	38	50
1100	-	-	-	-	48	71	-	-	48	70	43	60	-	-	42	58	38	51
1125	-	-	-	-	-	-	-	-	-	-	44	61	-	-	43	59	39	52
1150	-	-	-	-	-	-	-	-	-	-	45	62	-	-	44	60	40	53
1175	-	-	-	-	-	-	-	-	-	-	46	64	-	-	45	61	41	54
1200	-	-	-	-	-	-	-	-	-	-	46	65	-	-	45	62	41	55
1225	-	-	-	-	-	-	-	-	-	-	47	66	-	-	46	63	42	56
1250	-	-	-	-	-	-	-	-	-	-	48	67	-	-	47	65	43	57
1275	-	-	-	-	-	-	-	-	-	-	49	68	-	-	48	66	43	58
1300	-	-	-	-	-	-	-	-	-	-	49	69	-	-	48	67	44	59
1325	-	-	-	-	-	-	-	-	-	-	50	70	-	-	49	68	45	60
1350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	69	46	61
1375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	70	47	62
1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	63
1425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	64
1450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	65
1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	66
1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	67
1525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	67
1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	68
1575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	69
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	70
1625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Heat dissipation tables - Only valid for FORM 1

According IEC 60890, temperature rise in Kelvin

Back against the wall and one side covered - external dimensions  or 

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
25	-	-	3	4	2	3	3	5	2	3	2	3	2	4	2	3	2	3
50	-	-	5	7	4	6	5	8	4	6	4	5	4	6	4	5	3	4
75	-	-	6	9	6	8	7	11	6	8	5	7	6	9	5	7	5	6
100	-	-	8	12	7	11	9	14	7	11	7	9	8	11	7	9	6	8
125	-	-	10	14	9	13	11	17	9	13	8	11	9	13	8	11	7	9
150	-	-	11	17	10	15	13	19	10	15	9	13	11	15	9	12	8	11
175	-	-	12	19	11	16	14	22	12	17	10	14	12	17	10	14	9	12
200	-	-	14	21	13	18	16	24	13	18	12	16	13	19	12	16	10	14
225	-	-	15	23	14	20	18	27	14	20	13	17	15	21	13	17	11	15
250	-	-	17	25	15	22	19	29	15	22	14	19	16	23	14	19	12	16
275	-	-	18	27	16	24	21	32	17	24	15	21	17	25	15	20	13	18
300	-	-	19	29	18	25	22	34	18	26	16	22	18	27	16	22	14	19
325	-	-	21	31	19	27	24	36	19	27	17	23	20	29	17	23	15	20
350	-	-	22	33	20	29	25	38	20	29	18	25	21	30	18	25	16	21
375	-	-	23	35	21	30	27	40	21	31	19	26	22	32	19	26	17	23
400	-	-	24	36	22	32	28	43	23	32	20	28	23	34	20	27	18	24
425	-	-	25	38	23	34	29	45	24	34	21	29	24	35	21	29	19	25
450	-	-	27	40	24	35	31	47	25	35	22	30	25	37	22	30	20	26
475	-	-	28	42	25	37	32	49	26	37	23	32	27	39	23	31	21	27
500	-	-	29	44	26	38	33	51	27	39	24	33	28	40	24	33	22	28
525	-	-	30	45	28	40	35	53	28	40	25	35	29	42	25	34	23	30
550	-	-	31	47	29	41	36	55	29	42	26	36	30	44	26	35	23	31
575	-	-	32	49	30	43	37	57	30	43	27	37	31	45	27	37	24	32
600	-	-	34	50	31	44	39	59	31	45	28	38	32	47	28	38	25	33
625	-	-	35	52	32	46	40	61	32	46	29	40	33	48	29	39	26	34
650	-	-	36	54	33	47	41	63	33	48	30	41	34	50	30	40	27	35
675	-	-	37	55	34	49	43	65	34	49	31	42	35	51	31	42	28	36
700	-	-	38	57	35	50	44	67	35	50	32	43	36	53	32	43	28	37
725	-	-	39	59	36	52	45	69	36	52	33	45	37	55	33	44	29	38
750	-	-	40	60	37	53	46	71	37	53	34	46	38	56	33	45	30	39
775	-	-	41	62	38	55	-	-	38	55	34	47	39	58	34	47	31	40
800	-	-	42	64	39	56	-	-	39	56	35	48	40	59	35	48	32	41
825	-	-	43	65	40	57	-	-	40	58	36	50	41	60	36	49	32	43
850	-	-	44	67	41	59	-	-	41	59	37	51	42	62	37	50	33	44
875	-	-	46	68	42	60	-	-	42	60	38	52	43	63	38	51	34	45
900	-	-	47	70	42	61	-	-	43	62	39	53	44	65	39	52	35	46
925	-	-	-	-	43	63	-	-	44	63	40	54	45	66	40	54	36	47
950	-	-	-	-	44	64	-	-	45	65	41	56	46	68	40	55	36	48
975	-	-	-	-	45	66	-	-	46	66	41	57	47	69	41	56	37	49
1000	-	-	-	-	46	67	-	-	47	67	42	58	48	71	42	57	38	50
1025	-	-	-	-	47	68	-	-	48	69	43	59	-	-	43	58	39	51
1050	-	-	-	-	48	70	-	-	49	70	44	60	-	-	44	59	39	52
1075	-	-	-	-	-	-	-	-	-	-	45	61	-	-	45	61	40	53
1100	-	-	-	-	-	-	-	-	-	-	46	63	-	-	45	62	41	54
1125	-	-	-	-	-	-	-	-	-	-	46	64	-	-	46	63	42	55
1150	-	-	-	-	-	-	-	-	-	-	47	65	-	-	47	64	42	56
1175	-	-	-	-	-	-	-	-	-	-	48	66	-	-	48	65	43	56
1200	-	-	-	-	-	-	-	-	-	-	49	67	-	-	49	66	44	57
1225	-	-	-	-	-	-	-	-	-	-	50	68	-	-	50	67	45	58
1250	-	-	-	-	-	-	-	-	-	-	51	69	-	-	50	68	45	59
1275	-	-	-	-	-	-	-	-	-	-	51	70	-	-	51	69	46	60
1300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	71	47	61
1325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	62
1350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	63
1375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	64
1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	65
1425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	66
1450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	67
1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	68
1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	69
1525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	70
1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Heat dissipation tables - Only valid for FORM 1

According IEC 60890, temperature rise in Kelvin

Back against the wall and both sides covered - external dimensions

	447x450x2155		743x450x2155		959x450x2155		447x600x2155		743x600x2155		959x600x2155		447x800x2155		743x800x2155		959x800x2155	
Watt	12 Mod		24 Mod		36 Mod		12 Mod		24 Mod		36 Mod		12 Mod		24 Mod		36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
25	-	-	3	4	2	3	4	5	3	3	2	3	3	4	2	3	2	3
50	-	-	5	7	4	6	6	9	4	6	4	5	5	7	4	5	4	5
75	-	-	7	10	6	8	8	13	6	8	6	7	7	10	6	7	5	6
100	-	-	9	13	8	11	11	16	8	11	7	9	9	12	7	9	6	8
125	-	-	10	15	9	13	13	19	9	13	8	11	10	15	9	11	8	10
150	-	-	12	17	10	15	15	22	11	15	10	13	12	17	10	13	9	11
175	-	-	14	20	12	17	17	25	12	17	11	15	14	20	11	15	10	13
200	-	-	15	22	13	19	19	28	13	19	12	16	15	22	13	16	11	14
225	-	-	17	24	15	20	21	31	15	20	13	18	17	24	14	18	12	16
250	-	-	18	26	16	22	22	33	16	22	15	20	18	26	15	20	13	17
275	-	-	19	28	17	24	24	36	17	24	16	21	20	28	16	21	14	18
300	-	-	21	30	18	26	26	39	19	26	17	23	21	30	17	23	15	20
325	-	-	22	32	20	27	28	41	20	27	18	24	23	32	19	24	16	21
350	-	-	24	34	21	29	29	44	21	29	19	26	24	34	20	26	17	22
375	-	-	25	36	22	31	31	46	22	31	20	27	25	36	21	27	18	23
400	-	-	26	38	23	32	33	49	23	32	21	28	27	38	22	29	19	25
425	-	-	28	40	24	34	34	51	24	34	22	30	28	40	23	30	20	26
450	-	-	29	42	25	36	36	53	26	36	24	31	29	42	24	32	21	27
475	-	-	30	44	26	37	37	56	27	37	25	33	31	44	25	33	22	28
500	-	-	31	46	28	39	39	58	28	39	26	34	32	45	26	34	23	30
525	-	-	33	48	29	40	41	61	29	40	27	35	33	47	27	36	24	31
550	-	-	34	50	30	42	42	63	30	42	28	37	35	49	28	37	25	32
575	-	-	35	51	31	44	44	65	31	43	29	38	36	51	29	38	26	33
600	-	-	36	53	32	45	45	67	32	45	30	39	37	53	30	40	27	34
625	-	-	38	55	33	47	47	70	33	46	31	41	38	54	31	41	28	35
650	-	-	39	57	34	48	-	-	34	48	32	42	39	56	32	42	29	36
675	-	-	40	58	35	49	-	-	36	49	33	43	41	58	33	44	30	38
700	-	-	41	60	36	51	-	-	37	51	34	45	42	60	34	45	31	39
725	-	-	42	62	37	52	-	-	38	52	35	46	43	61	35	46	31	40
750	-	-	44	64	38	54	-	-	39	54	35	47	44	63	36	48	32	41
775	-	-	45	65	39	55	-	-	40	55	36	48	45	65	37	49	33	42
800	-	-	46	67	40	57	-	-	41	56	37	50	47	66	38	50	34	43
825	-	-	47	69	41	58	-	-	42	58	38	51	48	68	39	51	35	44
850	-	-	48	70	42	60	-	-	43	59	39	52	49	70	40	53	36	45
875	-	-	-	-	43	61	-	-	44	61	40	53	-	-	41	54	37	46
900	-	-	-	-	44	62	-	-	45	62	41	55	-	-	42	55	37	47
925	-	-	-	-	45	64	-	-	46	63	42	56	-	-	43	56	38	48
950	-	-	-	-	46	65	-	-	47	65	43	57	-	-	44	58	39	49
975	-	-	-	-	47	67	-	-	48	66	44	58	-	-	45	59	40	51
1000	-	-	-	-	48	68	-	-	49	68	45	60	-	-	46	60	41	52
1025	-	-	-	-	49	69	-	-	50	69	46	61	-	-	47	61	41	53
1050	-	-	-	-	50	71	-	-	51	70	46	62	-	-	48	62	42	54
1075	-	-	-	-	-	-	-	-	-	-	47	63	-	-	48	64	43	55
1100	-	-	-	-	-	-	-	-	-	-	48	64	-	-	49	65	44	56
1125	-	-	-	-	-	-	-	-	-	-	49	65	-	-	50	66	45	57
1150	-	-	-	-	-	-	-	-	-	-	50	67	-	-	51	67	46	58
1175	-	-	-	-	-	-	-	-	-	-	51	68	-	-	52	68	46	59
1200	-	-	-	-	-	-	-	-	-	-	52	69	-	-	53	70	47	60
1225	-	-	-	-	-	-	-	-	-	-	53	70	-	-	-	-	48	61
1250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	62
1275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	63
1300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	64
1325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	65
1350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	66
1375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	67
1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	68
1425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	69
1450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	70
1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	70
1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Heat dissipation values

According to EN 62208, IEC 62208 and IEC 60890

For each enclosures range (12, 24, 36 mod):

1. The 3 different matrix tables contain all the enclosure **dimensions**.
2. The tables are created according to the **positioning** of the enclosure.
3. **Two different values** of temperature rise are given depending on the measuring point in the cabinet: **half way** or **on top**.

What is acceptable acc. to EN 62208, IEC 62208 and IEC 60890

- For common electrical applications, a **temperature rise of 50K** is generally accepted. If the rise is above 50K, a larger enclosure should be chosen. More volume results in a decrease of the temperature rise.
- The **absolute** temperature in °C in the enclosure is **the sum** of the ambient temperature in °C and the **temperature rise** in K. According to the standards, the absolute temperature is **max. 70°C**

How to use a matrix?
First choose the right matrix according to the position and the size of the enclosure.
Second calculate the effective power loss in Watt (left column). Add 10-20% to the total effective power loss of the components in order to compensate the small wiring and connections.
Third read in the matrix the temperature rise in the cabinet due to the thermal power dissipation.

Example 1: Individual enclosure

Enclosure 24 modules / depth 600 mm.
Dimensions 743x600x2155 mm (see table page C.27).
Placed against the wall.
Installed components:
1 MCCB Record Plus FK 1250A, thermal magnetic type.
3 MCCB Record Plus FG 400A, electronic type.
Vertical busbar system in the rear 60x10 mm.

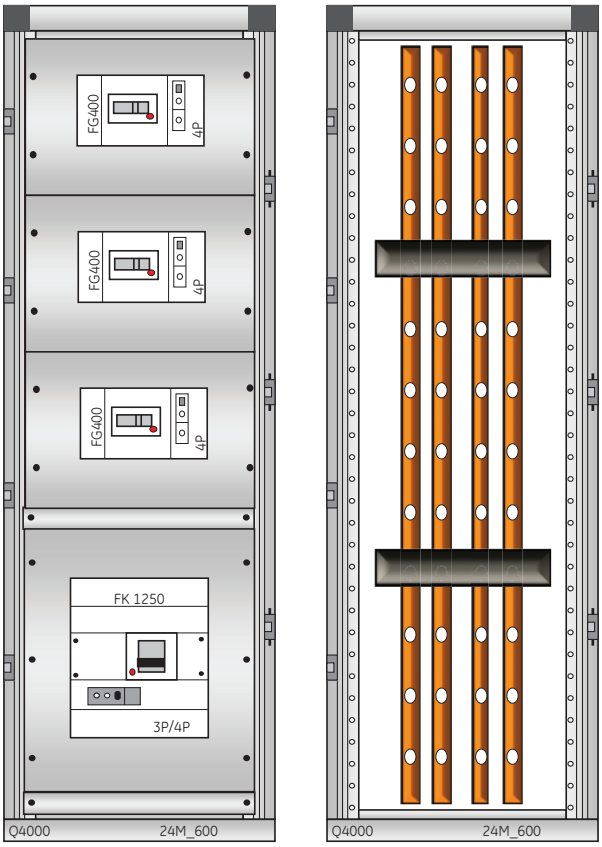
The components are equally distributed in the enclosure.

The calculated effective power loss of the installed components is 547 W*.
In the table 'Back against wall' (see table page C.27) read for 650 W (dissipation) and column '24 mod 743x600x2155 mm' the temperature rise (K).
'Half' is the temperature rise (K) in the middle of the enclosure.
'Top' is the temperature rise (K) on top of the enclosure.

*** Calculation of the power loss (at nominal current)**

- 1 MCCB Record Plus FK 1250A, thermal magn. type	164 W
- 3 MCCB Record Plus FG 400A, electronic type	3x53 W
- Vertical busbar system in the rear 60x10 mm	174 W
- 10% additional for wiring and connections	50 W
Total:	547 W

With an ambient temperature of 20°C, the absolute temperature around the components will be approximately :
20°C+27°C = 47°C in the middle of the enclosure
20°C+40°C = 60°C on top of the enclosure
If the temperature is too high for the components, then choose a larger enclosure to allow air ventilation. For the max. ambient temperature for the devices, read the technical documentation from the manufacturer or contact the customer service.
According the standards, the absolute temperature is max. 70°C.



Back against the wall - external dimensions

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
25	-	-	2	4	2	3	3	4	2	3	2	3	2	4	2	3	2	2
50	-	-	4	7	4	6	5	7	4	6	4	5	4	6	4	5	3	4
75	-	-	6	9	6	8	6	10	6	8	5	7	6	8	5	7	4	6
100	-	-	8	11	7	10	8	13	7	10	6	9	7	11	6	8	6	7
125	-	-	9	14	8	12	10	15	8	12	8	10	9	13	7	10	7	9
150	-	-	10	16	10	14	11	17	10	14	9	12	10	15	9	12	8	10
175	-	-	12	18	11	16	13	20	11	16	10	14	11	17	10	13	9	12
200	-	-	13	20	12	18	14	22	12	18	11	15	13	19	11	15	10	13
225	-	-	14	22	13	20	16	24	13	19	12	17	14	20	12	16	11	14
250	-	-	16	24	15	21	17	26	15	21	13	18	15	22	13	18	12	16
275	-	-	17	26	16	23	18	28	16	23	14	20	16	24	14	19	13	17
300	-	-	18	28	17	25	20	30	17	24	15	21	17	26	15	20	14	18
325	-	-	19	30	18	26	21	32	18	26	16	23	19	28	16	22	14	19
350	-	-	21	31	19	28	22	34	19	28	17	24	20	29	17	23	15	20
375	-	-	22	33	20	30	23	36	20	29	18	25	21	31	18	25	16	22
400	-	-	23	35	21	31	25	38	21	31	19	27	22	33	19	26	17	23
425	-	-	24	37	22	33	26	40	22	32	20	28	23	34	20	27	18	24
450	-	-	25	39	23	34	27	42	23	34	21	29	24	36	21	28	19	25
475	-	-	26	40	24	36	28	44	24	35	22	31	25	37	21	30	20	26
500	-	-	27	42	25	37	29	46	25	37	23	32	26	39	22	31	20	27
525	-	-	29	44	26	39	31	48	26	38	24	33	27	40	23	32	21	28
550	-	-	30	45	27	40	32	50	**27**	**40**	25	35	28	42	24	33	22	29
575	-	-	31	47	28	42	33	51	28	41	26	36	29	44	25	35	23	30
600	-	-	32	49	29	43	34	53	29	43	27	37	30	45	26	36	24	31
625	-	-	33	50	30	45	35	55	30	44	27	38	31	47	27	37	24	33
650	-	-	34	52	31	46	36	57	31	46	28	39	32	48	28	38	25	34
675	-	-	35	53	32	48	38	58	32	47	29	41	33	50	29	39	26	35
700	-	-	36	55	33	49	39	60	33	48	30	42	34	51	29	40	27	36
725	-	-	37	57	34	50	40	62	34	50	31	43	35	52	30	42	27	37
750	-	-	38	58	35	52	41	64	35	51	32	44	36	54	31	43	28	38
775	-	-	39	60	36	53	42	65	36	52	33	45	37	55	32	44	29	39
800	-	-	40	61	37	55	43	67	37	54	33	47	38	57	33	45	30	40
825	-	-	41	63	38	56	44	69	38	55	34	48	39	58	34	46	30	41
850	-	-	42	64	39	57	45	70	39	57	35	49	40	60	34	47	31	42
875	-	-	43	66	40	59	-	-	40	58	36	50	41	61	35	48	32	43
900	-	-	44	67	41	60	-	-	41	59	37	51	42	62	36	50	33	44
925	-	-	45	69	42	61	-	-	42	61	38	52	43	64	37	51	33	45
950	-	-	46	70	43	63	-	-	43	62	38	54	44	65	38	52	34	46
975	-	-	-	-	43	64	-	-	44	63	39	55	45	67	38	53	35	46
1000	-	-	-	-	44	65	-	-	44	64	40	56	46	68	39	54	36	47
1025	-	-	-	-	45	67	-	-	45	66	41	57	47	69	40	55	36	48
1050	-	-	-	-	46	68	-	-	46	67	42	58	48	71	41	56	37	49
1075	-	-	-	-	47	69	-	-	47	68	42	59	-	-	41	57	38	50
1100	-	-	-	-	48	71	-	-	48	70	43	60	-	-	42	58	38	51
1125	-	-	-	-	-	-	-	-	-	-	44	61	-	-	43	59	39	52
1150	-	-	-	-	-	-	-	-	-	-	45	62	-	-	44	60	40	53
1175	-	-	-	-	-	-	-	-	-	-	46	64	-	-	45	61	41	54
1200	-	-	-	-	-	-	-	-	-	-	46	65	-	-	45	62	41	55
1225	-	-	-	-	-	-	-	-	-	-	47	66	-	-	46	63	42	56
1250	-	-	-	-	-	-	-	-	-	-	48	67	-	-	47	65	43	57
1275	-	-	-	-	-	-	-	-	-	-	49	68	-	-	48	66	43	58
1300	-	-	-	-	-	-	-	-	-	-	49	69	-	-	48	67	44	59
1325	-	-	-	-	-	-	-	-	-	-	50	70	-	-	49	68	45	60
1350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	69	46	61
1375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	70	47	62
1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	63
1425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	64
1450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	65
1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	66
1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	67
1525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	67
1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	68
1575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	69
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	70

Example 2: coupled enclosures

Enclosure 1: 24 modules / depth 600 mm.
Enclosure 2: 12 modules / depth 600 mm.
Enclosure 3: 24 modules / depth 600 mm.
(Dimensions see tables page C.29)

Placed against the wall, 12 module enclosure in the middle.
Installed components in enclosure 1:
1 ACB EntelliGuard frame 1 fixed 2000A
Installed components in enclosure 2:
Vertical busbar system in the side 100x10 mm.
Installed components in enclosure 3:
5 MCCB Record Plus FG 400A, electronic type.
The components are equally distributed in the enclosure.

The calculated effective power loss of the installed components in each enclosure.
Choose the right matrix!
Enclosure 1: 485 W*
Enclosure 2: 383 W*
Enclosure 3: 292 W*

*** Calculation of the power loss (at nominal current)**

Enclosure 1

- 1 ACB EntelliGuard frame 1 fixed 2000A	171W
- Horizontal busbar 100x10	84W
- In and outgoing connections	186W
- 10% additional for wiring and connections	44W
Total:	485W

Enclosure 2

- Horizontal busbar 100x10 mm	84W
- Vertical busbar system 100x10 mm	264W
- 10% additional for wiring and connections	35W
Total:	383W

Enclosure 3

- 5 MCCB Record Plus FG 400A, electronic type	5x53 W
- 10% additional for wiring and connections	27 W
Total:	292 W

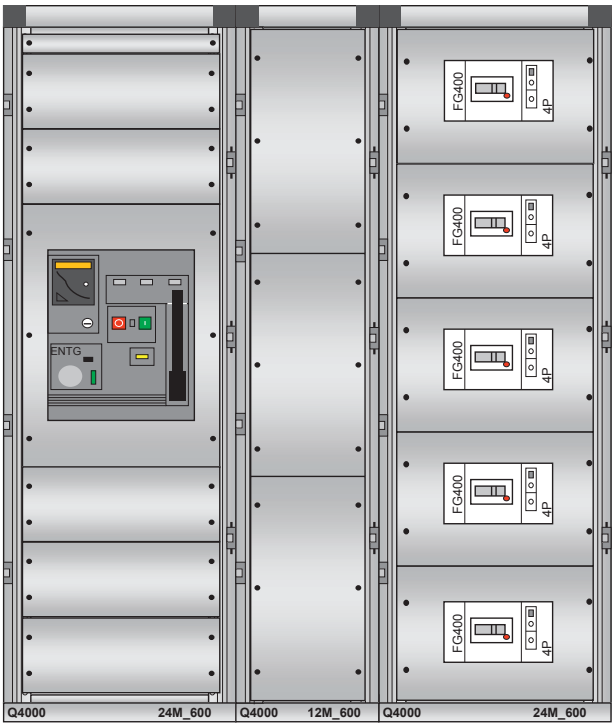
In the table (see tables page C.29) read for the calculated dissipation (W) and corresponding dimensions the temperature rise (K) 'Half' is the temperature rise (K) in the middle of the enclosure.
'Top' is the temperature rise (K) on top of the enclosure.
With an ambient temperature of 20°C, the absolute temperature around the components will be approximately:

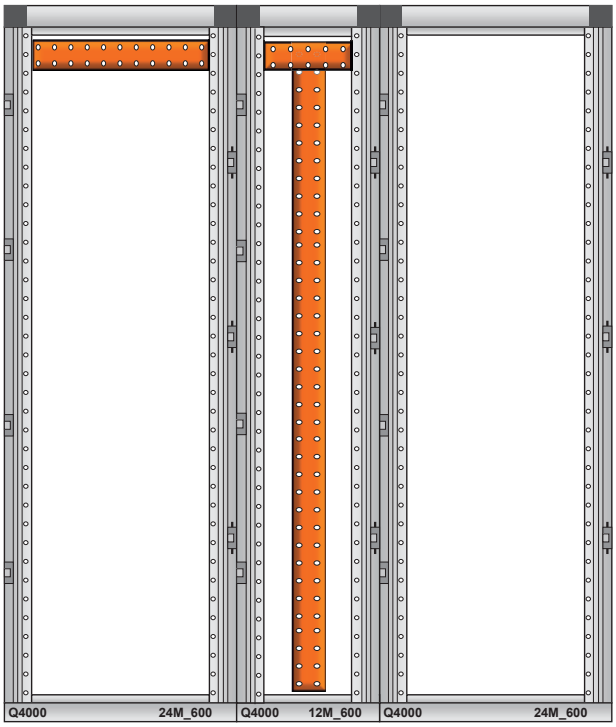
20°C+27°C = 47°C in the middle of the enclosure 1
20°C+39°C = 59°C on top of the enclosure 1

20°C+33°C = 55°C in the middle of the enclosure 2
20°C+49°C = 69°C on top of the enclosure 2

20°C+18°C = 38°C in the middle of the enclosure 3
20°C+26°C = 46°C on top of the enclosure 3

If the temperature is too high for the components, then choose a larger enclosure to allow air ventilation. For the max. ambient temperature for the devices, read the technical documentation from the manufacturer or contact the customer service. According the standards, the absolute temperature is max. 70°C.





Enclosure 1

Back against the wall and one side covered - external dimensions

 or 

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
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50	-	-	5	7	4	6	5	8	4	6	4	5	4	6	4	5	3	4
75	-	-	6	9	6	8	7	11	6	8	5	7	6	9	5	7	5	6
100	-	-	8	12	7	11	9	14	7	11	7	9	8	11	7	9	6	8
125	-	-	10	14	9	13	11	17	9	13	8	11	9	13	8	11	7	9
150	-	-	11	17	10	15	13	19	10	15	9	13	11	15	9	12	8	11
175	-	-	12	19	11	16	14	22	12	17	10	14	12	17	10	14	9	12
200	-	-	14	21	13	18	16	24	13	18	12	16	13	19	12	16	10	14
225	-	-	15	23	14	20	18	27	14	20	13	17	15	21	13	17	11	15
250	-	-	17	25	15	22	19	29	15	22	14	19	16	23	14	19	12	16
275	-	-	18	27	16	24	21	32	17	24	15	21	17	25	15	20	13	18
300	-	-	19	29	18	25	22	34	18	26	16	22	18	27	16	22	14	19
325	-	-	21	31	19	27	24	36	19	27	17	23	20	29	17	23	15	20
350	-	-	22	33	20	29	25	38	20	29	18	25	21	30	18	25	16	21
375	-	-	23	35	21	30	27	40	21	31	19	26	22	32	19	26	17	23
400	-	-	24	36	22	32	28	43	23	32	20	28	23	34	20	27	18	24
425	-	-	25	38	23	34	29	45	24	34	21	29	24	35	21	29	19	25
450	-	-	27	40	24	35	31	47	25	35	22	30	25	37	22	30	20	26
475	-	-	28	42	25	37	32	49	26	37	23	32	27	39	23	31	21	27
500	-	-	29	44	26	38	33	51	**27**	**39**	24	33	28	40	24	33	22	28
525	-	-	30	45	28	40	35	53	28	40	25	35	29	42	25	34	23	30
550	-	-	31	47	29	41	36	55	29	42	26	36	30	44	26	35	23	31
575	-	-	32	49	30	43	37	57	30	43	27	37	31	45	27	37	24	32
600	-	-	34	50	31	44	39	59	31	45	28	38	32	47	28	38	25	33
625	-	-	35	52	32	46	40	61	32	46	29	40	33	48	29	39	26	34
650	-	-	36	54	33	47	41	63	33	48	30	41	34	50	30	40	27	35
675	-	-	37	55	34	49	43	65	34	49	31	42	35	51	31	42	28	36
700	-	-	38	57	35	50	44	67	35	50	32	43	36	53	32	43	28	37

Enclosure 2

Back against the wall and both sides covered - external dimensions

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
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50	-	-	5	7	4	6	6	9	4	6	4	5	5	7	4	5	4	5
75	-	-	7	10	6	8	8	13	6	8	6	7	7	10	6	7	5	6
100	-	-	9	13	8	11	11	16	8	11	7	9	9	12	7	9	6	8
125	-	-	10	15	9	13	13	19	9	13	8	11	10	15	9	11	8	10
150	-	-	12	17	10	15	15	22	11	15	10	13	12	17	10	13	9	11
175	-	-	14	20	12	17	17	25	12	17	11	15	14	20	11	15	10	13
200	-	-	15	22	13	19	19	28	13	19	12	16	15	22	13	16	11	14
225	-	-	17	24	15	20	21	31	15	20	13	18	17	24	14	18	12	16
250	-	-	18	26	16	22	22	33	16	22	15	20	18	26	15	20	13	17
275	-	-	19	28	17	24	24	36	17	24	16	21	20	28	16	21	14	18
300	-	-	21	30	18	26	26	39	19	26	17	23	21	30	17	23	15	20
325	-	-	22	32	20	27	28	41	20	27	18	24	23	32	19	24	16	21
350	-	-	24	34	21	29	29	44	21	29	19	26	24	34	20	26	17	22
375	-	-	25	36	22	31	31	46	22	31	20	27	25	36	21	27	18	23
400	-	-	26	38	23	32	**33**	**49**	23	32	21	28	27	38	22	29	19	25
425	-	-	28	40	24	34	34	51	24	34	22	30	28	40	23	30	20	26
450	-	-	29	42	25	36	36	53	26	36	24	31	29	42	24	32	21	27
475	-	-	30	44	26	37	37	56	27	37	25	33	31	44	25	33	22	28
500	-	-	31	46	28	39	39	58	28	39	26	34	32	45	26	34	23	30
525	-	-	33	48	29	40	41	61	29	40	27	35	33	47	27	36	24	31
550	-	-	34	50	30	42	42	63	30	42	28	37	35	49	28	37	25	32
575	-	-	35	51	31	44	44	65	31	43	29	38	36	51	29	38	26	33
600	-	-	36	53	32	45	45	67	32	45	30	39	37	53	30	40	27	34

Enclosure 3

Back against the wall and one side covered - external dimensions

 or 

Watt	447x450x2155 12 Mod		743x450x2155 24 Mod		959x450x2155 36 Mod		447x600x2155 12 Mod		743x600x2155 24 Mod		959x600x2155 36 Mod		447x800x2155 12 Mod		743x800x2155 24 Mod		959x800x2155 36 Mod	
	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top	Half	Top
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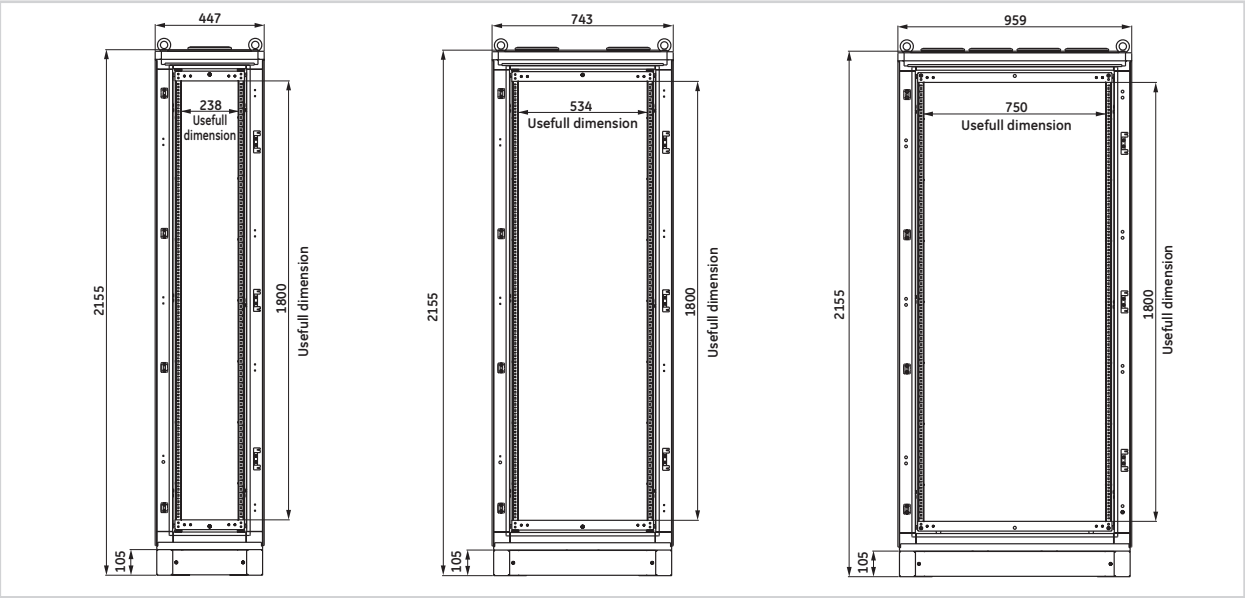
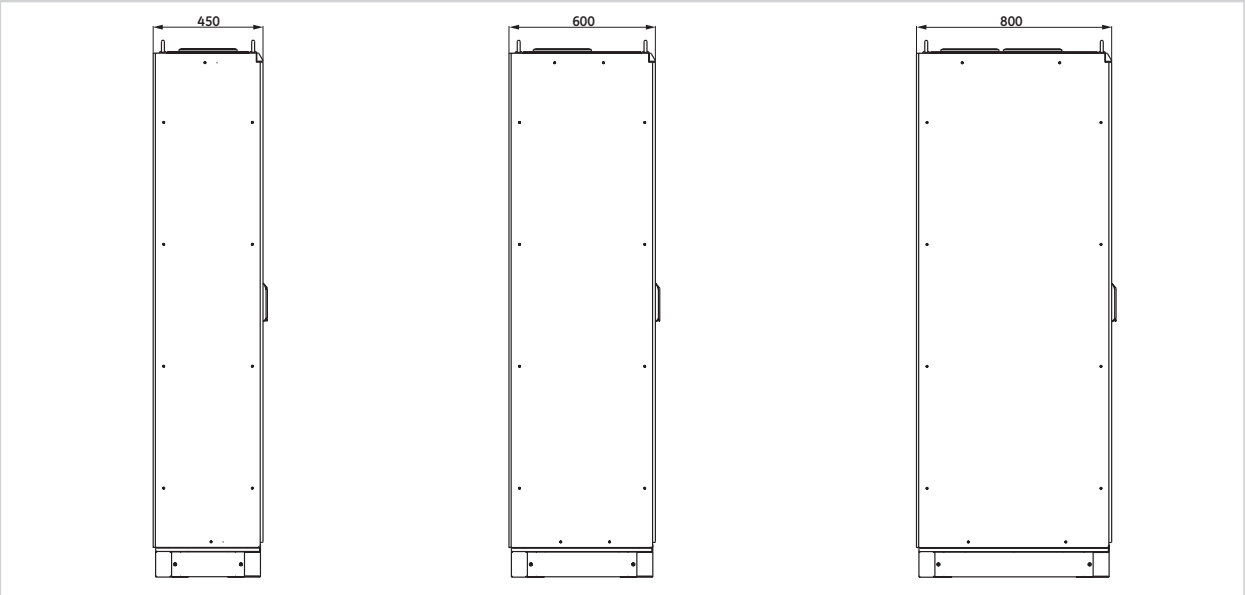
50	-	-	5	7	4	6	5	8	4	6	4	5	4	6	4	5	3	4
75	-	-	6	9	6	8	7	11	6	8	5	7	6	9	5	7	5	6
100	-	-	8	12	7	11	9	14	7	11	7	9	8	11	7	9	6	8
125	-	-	10	14	9	13	11	17	9	13	8	11	9	13	8	11	7	9
150	-	-	11	17	10	15	13	19	10	15	9	13	11	15	9	12	8	11
175	-	-	12	19	11	16	14	22	12	17	10	14	12	17	10	14	9	12
200	-	-	14	21	13	18	16	24	13	18	12	16	13	19	12	16	10	14
225	-	-	15	23	14	20	18	27	14	20	13	17	15	21	13	17	11	15
250	-	-	17	25	15	22	19	29	15	22	14	19	16	23	14	19	12	16
275	-	-	18	27	16	24	21	32	17	24	15	21	17	25	15	20	13	18
300	-	-	19	29	18	25	22	34	**18**	**26**	16	22	18	27	16	22	14	19
325	-	-	21	31	19	27	24	36	19	27	17	23	20	29	17	23	15	20
350	-	-	22	33	20	29	25	38	20	29	18	25	21	30	18	25	16	21
375	-	-	23	35	21	30	27	40	21	31	19	26	22	32	19	26	17	23
400	-	-	24	36	22	32	28	43	23	32	20	28	23	34	20	27	18	24
425	-	-	25	38	23	34	29	45	24	34	21	29	24	35	21	29	19	25
450	-	-	27	40	24	35	31	47	25	35	22	30	25	37	22	30	20	26
475	-	-	28	42	25	37	32	49	26	37	23	32	27	39	23	31	21	27
500	-	-	29	44	26	38	33	51	27	39	24	33	28	40	24	33	22	28

Dimensional drawings

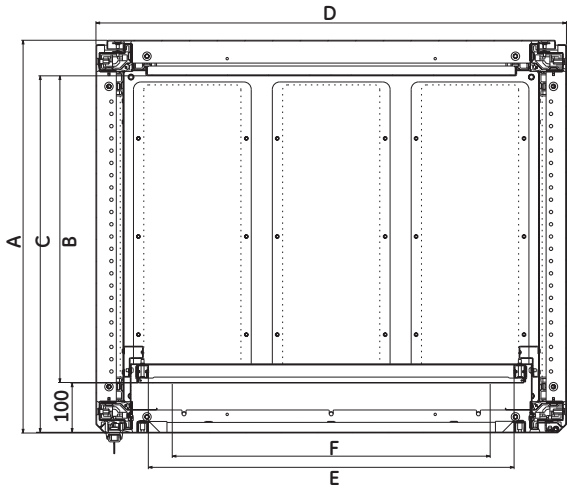
Frontview (in mm)



Sideview (in mm)



Cross-section

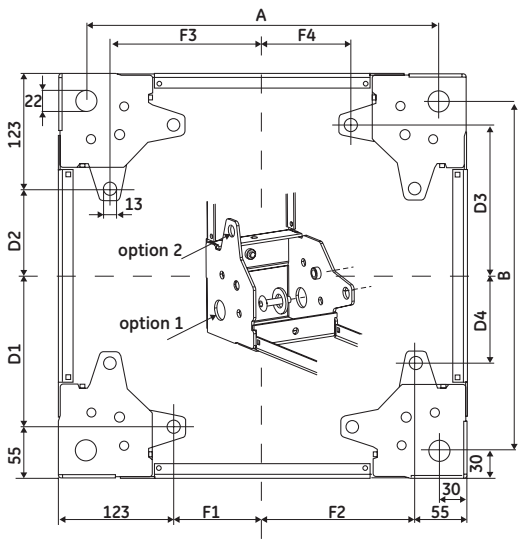


Dimensions in mm

	Usefull dimensions				External dimensions		
Width (E)	Width for devices (F)	Depth behind the coverplate (B)	Depth behind the door (C)	Height	Width (D)	Depth (A)	Height[1]
238	216 (12 mod)	275	375	1800	447	450	2155
534	432 (24 mod)	275	375	1800	743	450	2155
750	648 (36 mod)	275	375	1800	959	450	2155
238	216 (12 mod)	425	525	1800	447	600	2155
534	432 (24 mod)	425	525	1800	743	600	2155
750	648 (36 mod)	425	525	1800	959	600	2155
238	216 (12 mod)	625	725	1800	447	800	2155
534	432 (24 mod)	625	725	1800	743	800	2155
750	648 (36 mod)	625	725	1800	959	800	2155

(1) With base

Floor drilling plan



Width	12	24	36
A	374	670	886
Depth	450 mm	600 mm	800 mm
B	370	520	720
Width	12	24	36
F1 - F4	94	242	350
F2 - F3	162	310	418
B	370	520	720
Depth	450 mm	600 mm	800 mm
D1 - D3	160	235	335
D2 - D4	92	167	267

Specifications for tender documents

System Enclosure for Low Voltage distribution boards up to 4000A.

Conformity to standards
The panels are certified according to the IEC 61439-2 standard. All verification tests and individual tests required by the standard have been passed, and certified by the independent certification body DEKRA. Internal separation is Form 1. Form 2 and Form 3 can be achieved, as option.

Technical characteristics
The panel is designed of kit-form enclosures made from sheet steel for indoor use. The enclosures can be stand alone or coupled side to side or back to back, as floor standing disposal. Each enclosure consists of a rigid frame built with open profiles made of galvanized sheet steel 1.5 mm thick and four die-cast aluminum corner parts. The profiles are bolted in each corner. The external panels and the doors are made in epoxy polyester power coating sheet steel 1.5 mm thick. All the external panels (top, rear and side panels) are fixed, using screws, to the basic frame. Each one can be disassembled independently from the rest of the external panels. The sheet steel parts are pre-treated with iron phosphate and protected with epoxy polyester powdercoating RAL9006, giving a smooth finish. The colour for the external corner plastic parts, the handle and the base is RAL 7024.
The range of QuiXtra 4000 consists of 9 different sizes:
- Three external widths: 447, 743 and 959 mm
- One height: external dimensions, including the base of 100 mm: 2155 mm
- Three depths: 450 mm, 600 mm and 800 mm
- Useful dimensions:
  - Widths for 12, 24 and 36 modules 18 mm
  - Height of 1800 mm
  - Depth behind the coverplates: 275, 425 and 625 mm
  - Depth behind the door: 375, 525 and 725 mm

The DIN-rails, mounting plates or support on depth profiles of the functional units, and the busbar holders are fixed with special “click-in” support, attaching to the vertical profiles which are fixed to the front vertical profiles. QuiXtra 4000 allows free accessibility from all sides for the wiring and connection of electrical devices mounted on the DIN-rails, mounting plates or on supports on depth profiles.

The functional units, based on a modular concept with a height in steps of 50 mm are available for:
- Modular devices, for 12, 24 and 36 modules of 18 mm. In two different heights, 150 and 200 mm. One special function for screwless MCBs is available.
- Meters
- Push-buttons
- Moulded case circuit breakers. Up to 1600A. For fixed, plug-in and withdrawable execution when it’s available. To mount in horizontal or in vertical position
- Changeover functions with MCCBs
- Load break switches. Up to 1250A. To mount in horizontal or in vertical position.
- Air Circuit Breakers. Up to 4000A. Fixed or withdrawable execution
- Terminals
- Plain mounting plates. Partial and full height

Several busbars system can be mounted in the enclosure.
- **Enclosure depth 450 mm**
  - **Rear horizontal busbar.** Up to 1600A. The main horizontal busbar for the enclosures 450 mm deep is assembled on the rear part, one phase over the other.
  - **Vertical staircase busbar.** 2 solutions, up to 630A and up to 1600A, using different isolators. It’s possible to assemble in the enclosures 12 modules wide and in the integrated cable compartment.
  - **Rear vertical busbar.** 2 solutions. Up to 630A and up to 2000A, using different isolators. In the enclosures 12 modules wide only is possible the rear vertical busbar up to 630A
- **Enclosures depth 600 and 800 mm**
  - **Top and middle horizontal busbar.** Up to 2000A for 600 mm deep enclosures and up to 4000A for 800 mm deep.
  - **Vertical staircase busbar.** 2 solutions, up to 630A and up to 1600A, using different isolators. It’s possible to assemble in the enclosures 12 modules wide and in the integrated cable compartment.
  - **Vertical side busbar.** Up to 2000A in the integrated cable compartment, and up to 4000A in the 12 modules wide enclosure.
  - **Rear vertical busbar.** 2 solutions. Up to 630A and up to 2000A, using different isolators. In the enclosures 12 modules wide only is possible the rear vertical busbar up to 630A.
- Vertical and horizontal separation screens allow the upgrade of the internal segregation Form to Form 2 or Form 3, according the IEC 61439-2

The enclosures can be closed with two types of doors, plain and transparent. The plain door is available for the three enclosure widths and the transparent door is available for the 24 and 36 modules wide enclosures. The locking system is operated by a central handle and consists of a four point locking mechanism. The doors are equipped with a lock insert for a 2432E key. The door can be assembled and disassembled without any tools, and can be opened from the right or the left side of the enclosure. The opening angle is 135°.

The enclosure offers maximum protection to the users and equipment thanks to an IP55 protection degree with door and the IP55 external panels, following IEC 60529 and the IEC 62262. The enclosure can be assembled as IP30, is the external panels assembled are the IP30 ones available. Without the doors, the distribution panel would be IP30, with the external panels IP30 or IP55.
The enclosure has the DEKRA approval.

Electrical characteristics
Rated operational voltage: 415V, 690V
Rated insulation voltage: 1000V
Rated short-circuit current: 85kA /1s
Rated busbar current system: up to 4000A in IP30
Protection degree: IP55 with door and IP55 panels, IP30 with IP30 external panels, and with or without doors
The panel is designed for indoor use only
Ambient temperature: 35°C

Appendix

IEC 60439 vs IEC 61439 for Assemblies up to 4000A

The QuiXtra is designed according the recently published norm IEC 61439-1 and IEC 61439-2, pertaining to this type of system enclosure, in mind.

The new IEC 61439-2 supersedes the IEC 60439-1 norm. IEC 60439 was the norm that introduced the world to "type tested" and "partially type tested" assemblies. Because this terminology in the norm was open to gray zones and subjective interpretations, and therefore safety risks, they cease to exist in the new norm. The new standard IEC 61439 introduce the "Design verification" approach. The Design verification is achieved by testing, calculation or measurement and satisfying the design rules defined by the original manufacturer (OEM).
The structure of the new IEC 61439 evolves from the IEC 60439. The structure for the new standard is:
- IEC 61439-1. General rules
- IEC 61439-2. Power Switchgear and Controlgear assemblies (PSC-Assemblies)

IEC 61439-1 introduces a few new terms.

- Original Equipment Manufacturer (OEM): company producing enclosures and electrical switchgear: Here: GE
- Assembly Manufacturer: company assembling enclosures and equipping them with electrical switchgear. Responsible of the complete Assembly. Here: Panel Builder
- Verification test: test performed by the original manufacturer to ensure that its enclosures and electrical switchgear are compliant with the norms.

In order for an assembly to comply to the new IEC 61439-2 norm, the original manufacturer needs to have conducted and passed verification tests for its enclosures and components. For those enclosures and components, the OEM needs to provide documentation (typically in the form of Tables), enabling calculation of the critical parameters (heat dissipation, cable cross-sections) of an assembly, as well as clear instructions for its assembly and use.

The Assembly Manufacturer then makes this calculation for each assembly, and builds the assembly, strictly adhering to the instructions of the OEM.

If an assembly manufacturer uses a component not tested by the OEM of the enclosure, or if he makes modifications to the assembly not following the OEM's use instructions, it becomes his responsibility to ensure compliance with IEC 61439-2. That compliance must then be tested via a comprehensive test, to be performed by the assembly manufacturer.

GE has taken care to design the QuiXtra, together with original Record Plus, Dilos, Fulos and Redline/ElfaPlus equipment, to be fully compliant to IEC 61439-2. When building an assembly with GE components, and using the tables and calculation methods provided by GE, the assembly manufacturer can rest assured that his end product is fully IEC 61439-2 compliant.

By reference number

Ref. nr.	Pag.
610000	
610142	B.31
617000	
617947	B.31
811000	
811516	B.31
828000	
828056	B.31
828142	B.31
828145	B.30
828162	B.20
828163	B.20
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887281	B.17
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