WORLDWIDE PARTNER

Modula Plus

Sheet steel distribution system

GE imagination at work

Sheet steel distribution system

Modula Plus

Low voltage distribution boards for Industrial and Commercial applications

Industrial

- Construction materials
- Small factories
- Waste recycling
- Water treatment
- Cement
- Food - Beverage
- OEM
- Components-parts productions
- Small assembly lines
- Printing

High commercial

- Telecommunications
- Data–call centers
- Airports
- Hospitals
- Banks
- Public transport
- Railways
- Subways
- Governemental buildings

Low commercial

- Large commercial offices
- Shopping malls
- Schools
- Stores
- Small offices
- Gasoline stations
- Restaurants
- Small shops

Applications

Modula Plus has been developed as an universal range of system enclosures for all kind of applications in low voltage distribution for the commercial and industrial environment.

Modula Plus is offered in kit-form to be assembled, equipped and wired by Panelbuilder and Installer.

The range consists of sheet steel floor standing enclosures, busbar systems and functional units prepared to mount LV devices offered by GE.

Modula Plus complies with standard IEC 60439-1 for Low Voltage application with rated current up to 4000A, offering protection degree from IP30 up to IP55.

Its aesthetically pleasing characteristics allow flexibility when selecting a suitable location.

Designed as an integrated system it combines both flexibility and ease of assembly with the reliability of a development dedicated for use in LV distribution.

Modula Plus

Description

Modula Plus is a range of sheet steel system enclosures offered in kit-form,
designed for low voltage distribution boards up to 4000A

Cabinets are offered in depth 500mm and 700mm, in width 650mm and 900mm.
In addition, enclosures of 400mm width allow flexible layout of vertical risers and offering wide wiring space.
The doors are equipped with a four point closing mechanism, operated by a central handle. As standard, the closing mechanism is operated by a double-bit lock which can easily be replaced by a handle prepared to receive standard profile half cylinders.
Plain doors offer an opening angle of 130°, transparent and design doors can be opened to an angle up to 180°.

For ease of incoming cables each cabinet includes an entry plate at the bottom, made of three parts.

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

Protection degree

With door IP55
Without door IP30 (equipped with functional units and coverplates)

Protection class

Earthing, protection class I

Material

Cabinet structure	Sheet steel, thickness 1mm
External panel	Sheet steel, tickness 2mm, powder coated
Doors	Sheet steel, thickness 2mm, powder coated

Colour	
External panel	RAL 7035
Coverplates	RAL 7024
Design doors	RAL 7035 / 7024

Mounting plates	Sendzimir zinc plated steel
Mounting profiles	Sendzimir zinc plated steel

Technical data

Nominal voltage	690V, 50/60 Hz
Nominal current	up to 4000A

Standards

IEC EN 60439 part 1

Technical data

Electrical data

Rated operational voltage Ue	690V
Rated insulation voltage Ui	1000V
Rated frequency	50-60Hz

Rated current of busbar systems

- horizontal in the top	IP55	3000A
	IP30	4000A
- vertical busbar	IP55	3000A
	IP30	4000A
Rated short-circuit current Icw		70kA /1s

Mechanical data

Dimensions	Height	2000mm
	Depth	500mm, 700mm
	Width	400mm, 650mm, 900mm

Internal separation	Form 1, form 2
	Form 3 (incoming section)

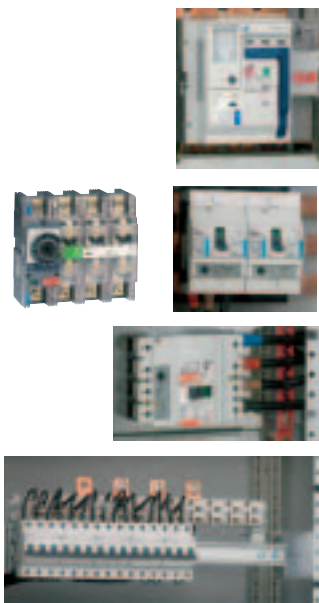# Standard application

Feeder

Air circuit breaker	400 up to 4000A	fixed withdrawable
Loadbreak switches	up to 2500A	fixed fused or fuseless
Moulded case circuit breakers	up to 1600A	fixed plug-in

Outgoing circuits

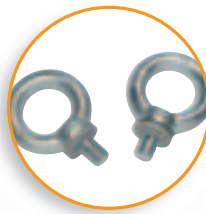|		
Moulded case circuit breakers	up to 1600A	fixed or plug-in
Loadbreak switches	up to 2500A	fixed, fused or fuseless
Miniature circuit breakers		

A.5

Modula Plus

Safety
- Tested according IEC 60439-1
- Short-circuit proof
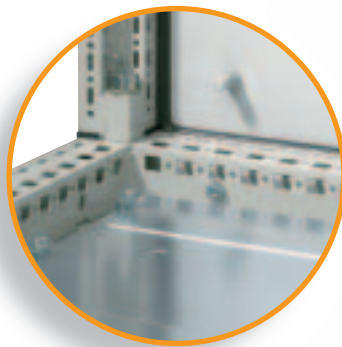- Earth continuity proven

Ease of handling
- Lifting eye bolts are delivered as standard with each enclosure
- Transport segments can be coupled with stable lifting brackets for crane transport
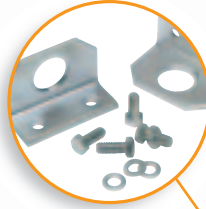
Flexible layout
- Equipment zone
  - width 650mm
  - width 900mm
- Busbar zone
  - in the top
  - lateral
- Cabling zone
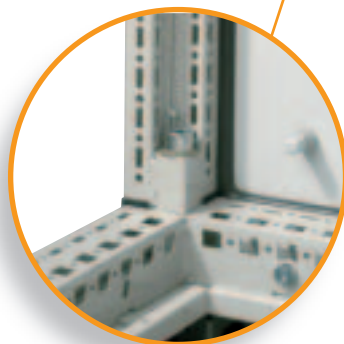 - integrated cable compartment
  - enclosure of 400mm width

Cable entry
- Cable entry plate made of 3 parts included as standard in enclosures of width 650mm and 900mm
- Bases are offered in height of 100mm or 200mm

Reliable construction
- Welded top- and bottom frame
- Painted frame
- Doors and covers 2mm sheet steel, powder coated

Accessibility
- Door opening angle
  - 130° as standard
  - 180° with transparent and design doors
- Doors can easily be removed
- Removable side and rear panel
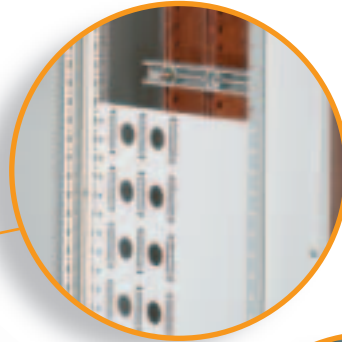- Coverplates can be removed individually

Aesthetics
- Finish in light grey, RAL 7035
- Choice of doors
  - plain sheet steel
  - transparent, with wide area equipped with glass
  - design door
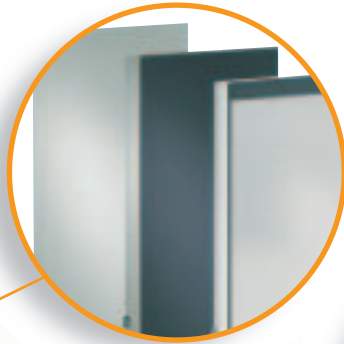
Safety
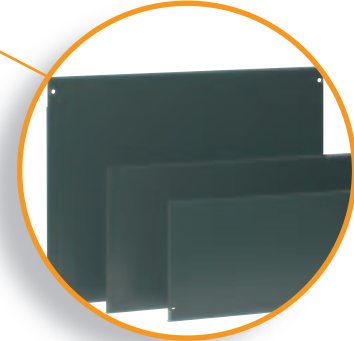- IP20 separation shrouds offered to prevent from accidential access to the busbars

Ease of cabling
- Wide lateral cut-outs in mounting plates of functional units
- Integrated or separate cable compartment

Modularity
- Coverplates and functional units offered from height 50mm up to 700mm
- LV devices can be mounted in horizontal or vertical position

Integrated system
- Modula Plus is developed as an integrated system prepared to receive all kind of GE low voltage devices – in conformity to standards proven by typetesting.

Benefits

A

B

C

X

Modula Plus

General description

Modula Plus has been developed by GE as a universal range of system enclosures for all kind of applications in low voltage distribution in commercial and industrial environment.

Distribution panel type Modula Plus cover a wide range of internal protection – from IP30 up to IP55. Whereas IP30 is already achieved without doors by using the coverplates delivered with each functional unit. Higher protection is achieved with the doors: plain, transparent or design - IP55. When installed in visible area and for easy inspection of equipment mounted inside the enclosure, transparent doors or design doors offer an answer to today's request for products not only fulfilling technical characteristics but providing added value by nice aesthetics.

All kind of electrical devices can be mounted easily by using the appropriate functional units which are delivered in kit-form including all necessary fixation elements and coverplates already adapted with suitable cut-outs.

Modula Plus is developed as a system enclosure, offered as kits to be assembled, equipped and wired by panelboard builder and installer.

Designed as flat-pack, an enclosure consists of a number of kits which allows maximum flexibility to adapt each panel exactly to the needs of a specific application.
Each enclosure is based on a strong, welded frame on top and bottom, always being delivered with a plain roofplate, eye lifting bolts and a bottom plate in three parts for easy cable entry from the bottom.
Vertical uprights are bolted with a central screw to this frame, building the enclosure structure.

These vertical uprights are delivered with all fixation elements for rear panel, hinges and closing mechanism for the doors already mounted. This saves assembly time and prevents from making mistakes during the assembly.
A functional frame mounted to the front vertical uprights support mounting plates for LV devices and cover plates preventing operators from getting access to life parts inside of the enclosure.

Modula Plus enclosures are available with height of 2000mm offering a depth of 500mm or 700mm. To allow flexible layout of the panel, functional units can be mounted in enclosures of width 650 or 900mm. In addition, enclosures of width 900mm can be equipped with a kit for integrated busbar or cable compartment offering sufficient space for vertical busbars or outgoing cables. As alternative to an integrated busbar compartment, separate enclosures with width 400mm are offered to serve as busbar compartment.

Depending on type of application and ambient conditions the enclosures may be equipped with doors offering IP degree up to IP55, transparent doors equipped with a wide area of glass or a range of design doors combining functionality with a nice aesthetic.

Modula Plus

Kit structure

Modula Plus is a range of floor standing system enclosures delivered in kit-form, to be assembled, equipped and wired by panel builder and Installer.

Each enclosure consists of different kits which can easily be selected from the overview below.
An enclosure consists of a welded frame on bottom and top. Vertical uprights are bolted with a central bolt on top and bottom, building the cabinet structure.
In order to be able to receive functional units, a functional frame has to be mounted to the front of enclosures of width 650 and 900mm. Thanks to this functional frame, cover plates and functional units of width 500mm may be fitted into enclosure width 650mm, whereas the enclosure of width 900mm may receive functional units and cover plates of 750mm width.
As alternative, the enclosures of 900mm width can be equipped with a functional frame including an integrated cable compartment. When this option is chosen, the enclosure of 900mm width as well needs to be equipped with functional units of width 500mm.
Rear panel, bases, side panel and doors can be fitted to the enclosure structure to ensure IP degree and good-looking finish.

Overview of the kit structure and a brief description of the content of each kit.
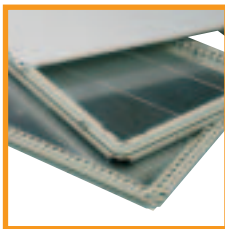
Top and bottom frame
Including roofplate, lifting eye bolts and bottom plate in 3 parts (enclosure width 650mm and 900mm). Includes gasket and parts for maintain IP with enclosures coupled.
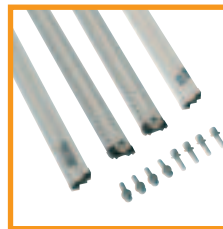
Vertical uprights
Set of 4 pieces including fixation material, fixing elements for rear panel, hinges and closing mechanism for door already premounted.
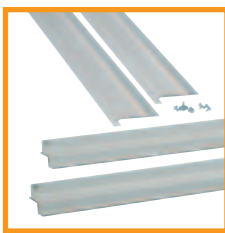
Functional frame
Consisting of two vertical uprights, two horizontal parts in top and bottom and fixation elements.
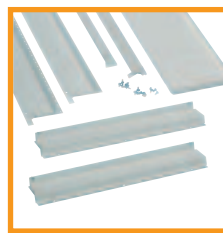
Functional frame with integrated cable compartment
In addition to the content of a standard functional frame, two additional vertical uprights and a cover plate for the cable compartment are included.

External panel
Rear panel (1 piece)
Side panel (set of 2 pieces)
Delivery always includes all required fixation elements.

Doors
Hinges and closing mechanism already pre-mounted to the vertical uprights;
Transparent and design doors are delivered with hinges offering 180° opening angle.

Functional units
Kit of mounting accessories to support low voltage devices.
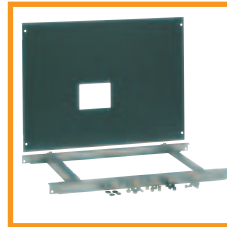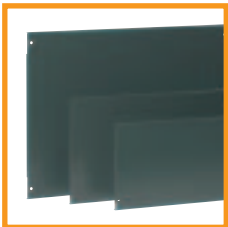Content: mounting plates or mounting frames, coverplates with cut-out according to the device, fixation material.

Functional units
Devices with high rated current are supported by stable mounting frames.
Additional depth profiles need to be ordered according to the depth of enclosure.

Cover plates
Content: coverplate, fixation screws, distance holder, metric clips. Coverplates are offered from height 50mm up to 600mm allowing a flexible layout e.g. by providing space between functional units.
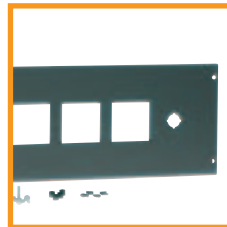
Cover plates for meters
Content: coverplate provided already with cut-outs for meters and change-over switch, fixation screws, distance holder, metric clips.

Bases
Each base consists of 4 corner parts and removable covers in front, rear and laterally.
Bases are offered in heigth 100mm or 200mm.

Comfort handle
Handle prepared to receive standard profile half-cylindric lock. The handle can easily be mounted, using same cut-out and fixation screws as the standard double-bit locking mechanism.

Lifting eye bolts
4 lifting eye bolts are delivered as standard with each cabinet.
As alternative when intending to move equipped transport units, a set of reinforced lifting brackets can be chosen.
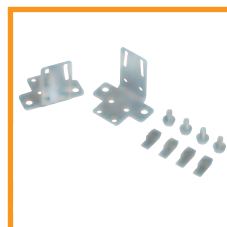
Side connection kit
Set of 4 corner profiles including all fixation screws.
This kit is especially designed for coupling of equipped transport units.

Modula Plus

Notes
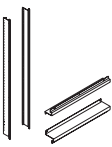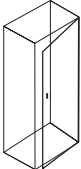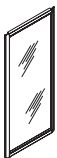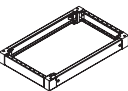
Selection table - Depth 500mm / 700mm

	Width	650mm	900mm	900mm Integrated cable compartm.	400mm Separate cable compartm.	650mm	900mm	900mm Integrated cable compartm.	400mm Separate cable compartm.	Pack.
				Depth 500mm				Depth 700mm		
	Top and bottom frame	884001	884002	884002	884000	884004	884005	884005	884003	1
	Vertical uprights Set of 4 pieces.	884006	884006	884006	884006	884006	884006	884006	884006	1
	Functional frame	884007	884008	884009	–	884007	884008	884009	–	1
	Functional door	884080	884079	884080	–	884080	884079	884080	–	1
	Rear panel Incl. fixation material	884011	884012	884012	884010	884011	884012	884012	884010	1
	Side panel Set of two pieces, incl. fixation material	884013	884013	884013	884013	884014	884014	884014	884014	1
	Doors - Plain steel, IP55	884019	884020	884020	884018	884019	884020	884020	884018	1
	- Transparent, IP55	884021	884022	884022	–	884021	884022	884022	–	1
	- Design, IP55	884024	884025	884025	884023	884024	884025	884025	884023	1
	Base height 100mm	884027	884028	884028	884026	884030	884031	884031	884029	1
	200mm	884033	884034	884034	884032	884036	884037	884037	884035	1
	Ventilated roof IP30	884038	884039	884039	–	884040	884041	884041	–	1

General accessories

Lifting brackets

| | 884048 | 1 |

Set of lifting brackets for safe crane transport of equipped transport sections.
Kit of 2 lifting brackets and fixation material.

Comfort handle

| | 884059 | 1 |

Handle prepared to receive standard profile half cylindric lock. Half cylinder profile not included.
This handle is mounted with the standard screws delivered with each door.
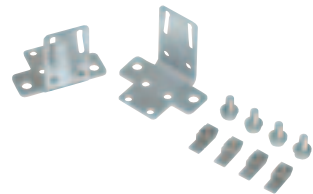
Coupling kit

| | 884049 | 1 |

Kit for safe coupling of two enclosures building a transport section.
Set of 4 corner profiles including all fixation material.

Locks - profile half cylinder type

| | 843001 | 1 |

With 2 keys, V2432-E

| | 843002 | 1 |

With 1 square key, 8mm

| | 843003 | 1 |

With 1 triangular key, 8mm

| | 843248 | 1 |

With 2 keys A434
Spare keys are available on request
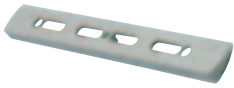
Adapter for design and transparent door

| | 884060 | 1 |

Adapter to mount comfort handle on design and transparent doors.

Paint RAL 7035

| | 880669 | 1 |

For minor touch-ups on external panel.
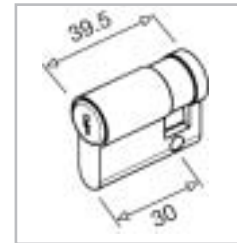
Mounting profiles
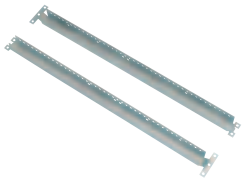
Depth profile

| Depth 500mm | 884050 | 1 |
| Depth 700mm | 884051 | 1 |

fixed to the functional frame in front and the enclosure structure in the rear.

| Depth 500mm | 884052 | 1 |
| Depth 700mm | 884053 | 1 |

can be fixed to the enclosure structure in front and rear.
They are used to mount the vertical busbar in an integrated and separate cable compartment.
Set of two pieces including fixation material

Rear profile

| Width 650mm | 884055 | 1 |

Profile to fix busbar holder to the rear of an enclosure width 650mm or in an enclosure with integrated cable compartment.
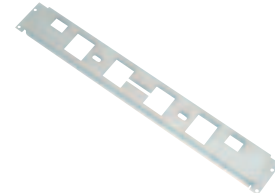
| Width 900mm | 884056 | 1 |

Profile to fix busbar holder to the rear of an enclosure width 900mm.
Set of two pieces including fixation material.
This profile can be used for both busbar systems up to 630A and 2000A.

Bottom support for vertical busbars

| | 884054 | 1 |

Consists of one L-shape support including fixation material.
This profile is used as well to support a horizontal busbar system in the integrated cable compartment.

Bracket

| | 884057 | 1 |

Bracket to mount staircase busbar in an integrated cable compartment.

| | 884058 | 1 |

Bracket to mount staircase busbar in an separate cable compartment.
Set of two pieces including fixation material.

Modula Plus

Functional units for modular DIN-rail devices
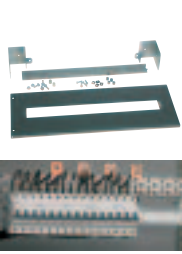
Functional unit for modular devices include:
- DIN-rail for mounting the modular equipment
- fixation brackets to attach the DIN-rail to the functional frame
- coverplate with cut-out for DIN-devices
- screws to mount the DIN-rail and the fixation brackets
- screws to fix the cover plate

Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
Width 500mm (24 modules of 18mm)		Width 750mm (36 modules of 18mm)		
Height 150mm	**883778**	Height 150mm	**883780**	1
Height 200mm	**883779**	Height 200mm	**883781**	1

Brackets for recessed mounting of DIN-rails
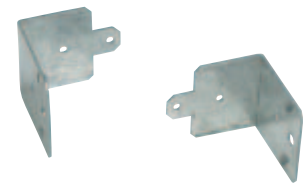
Brackets for recessed DIN-rail

	Ref. No.	Pack.
These brackets allow modification of a standard DIN-rail function to receive MCCBs type Record Plus FD-frame. Set of 2 brackets. (one set need to be ordered in addition for each function for MCBs: 883778, 883779, 883780 or 883781)	**883998**	1

Height adapter profiles
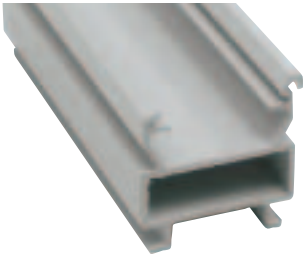
Profile to mount MCB next to MCCB on a recessed DIN-rail

	Ref. No.	Pack.
Profile of length 1,2 m	**883997**	1
Profile of length 354mm	**617947**	1
Profiles allow mouting of MCBs next to MCCB Record Plus FD-frame on a recessed DIN-rail. (profile of length 354mm allows mounting of 18 or 19 modules next to a MCCB 4 or 3 pole in a functional unit of 24 modules)		

Support for horizontal canalisation (only for use with functional units for modular devices of height 200mm)
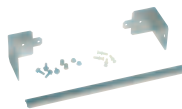
Kit for mounting horizontal cable canalisation up to dimensions 60x40mm
The kit includes:
- horizontal profile supporting the canalisation profile
- lateral mounting brackets for fixation on the functional frame
- screws to fix the horizontal profile and the mounting brackets.

Note: Cable trunking is not included!

	Ref. No.		Ref. No.	Pack.
	Width 500mm		Width 750mm	
Support	**883766**	Support	**883776**	1

Functional units for terminals
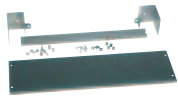
	Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
	Width 500mm (24 modules of 18mm)		Width 750mm (36 modules of 18mm)		
Functional unit for terminals include: - DIN-rail for the terminals - fixation brackets to attach the DIN-rail to the functional frame - plain cover plate - screws to mount the DIN-rail and the fixation brackets - screws to fix the cover plate	Height 150mm	883767	Height 150mm	883777	1

Cover plates for meters
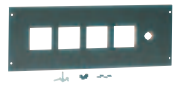
	Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
Each kit includes a coverpanel with cut-outs, fixation screws and two hinges.	500 x 200 – for 4 meters 72x72mm	883782	750 x 200 – for 4 meters 72x72mm	883788	1
	500 x 200 – for 2 meters 72x72mm	883783	750 x 200 – for 2 meters 72x72mm	883789	1
	500 x 200 – for 4 meters 96x96mm	883861	750 x 200 – for 4 meters 96x96mm	883863	1
	500 x 200 – for 2 meters 96x96mm	883862	750 x 200 – for 2 meters 96x96mm	883864	1

Blind cover plates

	Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
Each kit includes a plain coverpanel and fixation screws.	500 x 50mm	883759	750 x 50mm	883769	1
	500 x 100mm	883760	750 x 100mm	883770	1
	500 x 150mm	883761	750 x 150mm	883771	1
	500 x 200mm	883762	750 x 200mm	883772	1
	500 x 250mm	883763	750 x 250mm	883773	1
	500 x 300mm	883874	750 x 300mm	883878	1
	500 x 400mm	883764	750 x 400mm	883774	1
	500 x 600mm	883765	750 x 600mm	883775	1

Recessed cover plates (40mm)

	Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
Each kit includes a plain coverpanel and fixation screws. The coverplate is recessed by 40mm and enlarges the space between cover plate and door from 93mm to 133mm.	500 x 300mm	883943	750 x 300mm	883944	1

Ventilated cover plates
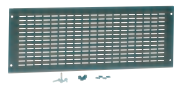
	Dimensions	Ref. No.	Dimensions	Ref. No.	Pack.
S = cross section of total ventilation surface. Each kit includes a plain cover panel and fixation screws.	500 x 200mm S = 120 cm^2	883758	750 x 200mm S = 185 cm^2	883768	1

Mounting plates
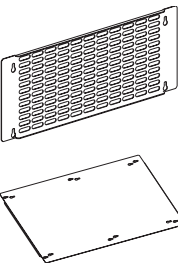
	Height	Width	Perforated	Ref. No.	Pack.
Perforated	200 mm	500 mm	no	884081	1
	400 mm	500 mm	no	884082	1
	600 mm	500 mm	no	884083	1
	200 mm	500 mm	yes	884084	1
	200 mm	750 mm	no	884085	1
	400 mm	750 mm	no	884085	1
Plain	600 mm	750 mm	no	884087	1
	200 mm	750 mm	yes	884088	1

To assembly the mounting plates, 2 sets of depth profiles are necessary:
• Depth 500mm with functional chassis: 2 x 884051
• Depth 700mm with functional chassis: 2 x 884052
Blind cover plate not included. Brackets included.

Functional units for MCCB Record Plus without RCD
All breakers with manual operation
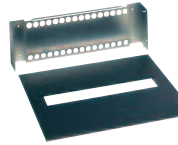
Functional unit for MCCB type Record Plus include:
- Mounting plate for the breaker
- cover plate with cut-out
- screws to fix the mounting plate on the functional frame
- screws to fix the cover plate
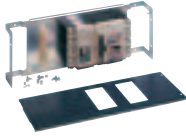
Note: a covering profile to fill the cut-out in the cover plate is included in every functional unit for 3 breaker.

Functional unit to mount moulded case circuit breaker type Record Plus

Note: all functional units allow front or rear connection of the breaker.

Functional units for MCCB type Record Plus FK1600 include:
- Frame to mount the breaker
- cover plate with cut-out
- screws to fixt the mounting frame on the functional frame
- screws to fix the cover plate

Depth profile to mount a functional unit type Record Plus FK1600 in horizontal position. Two set of depth profiles need to be ordered with every functional unit depending on the depth of the enclosure.

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
FD160	Width 500mm					
	883950	FD160	horizontal	1	150	1
	883957	FD160	vertical	4	250	1
	Width 750mm					
	883955	FD160	horizontal	1	150	1
	883958	FD160	vertical	6	250	1
FE250	Width 500mm					
	883959	FE250	horizontal	1	200	1
	883966	FE250	vertical	3	450	1
	Width 750mm					
	883964	FE250	horizontal	1	200	1
	883968	FE250	vertical	3	450	1
FG630	Width 500mm					
	883973	FG630/3pole	horizontal	1	250	1
	883975	FG630/4pole	horizontal	1	250	1
	883987	FG630/3pole	vertical	1	600	1
	883989	FG630/4pole	vertical	1	600	1
	Width 750mm					
	883983	FG630/3pole	horizontal	1	250	1
	883985	FG630/4pole	horizontal	1	250	1
	883991	FG630/3pole	vertical	1	600	1
	883993	FG630/4pole	vertical	1	600	1
FK1600	Width 500mm					
	884073 [1]	FK1600	horizontal	1	400	1
	884074 [1]	FK1600	vertical	1	600	1
	Width 750mm					
	884075 [1]	FK1600	vertical	1	600	1

(1) MCCB type Record Plus FK1600 are fixed on a mounting frame.
   For mounting the frame into an enclosure, always two set of depth profiles need to be ordered according to the depth of enclosure.
   e.g. For FK 1600, horizontally mounted in enclosure
   Depth 500mm: 884073 + 2 x 884050
   Depth 700mm: 884703 + 2 x 884051

All functional units fit in enclosure depth 500mm and depth 700mm.

Accessories

Plastic cable binder support

883996	1

Set of 24 pieces

These supports can be fitted to each functional unit for MCCB Record Plus up to FG frame (630A)

Cover profile

883970	1

Cover profile for standard cut-outs of 65mm for Record Plus breaker FD and FE frame.

L = 1.2 m

Order codes

A
B
C
X

Functional units for MCCB Record Plus with RCD

All breakers with manual operation

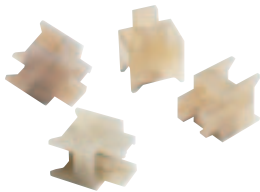|		Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
Functional unit for MCCB type Record Plus include: - Mounting plate for the breaker - cover plate with cut-out - screws to fix the mounting plate on the functional frame - screws to fix the cover plate Note: a covering profile to fill the cut-out in the cover plate is included in every functional unit for 3 breaker.	FD160	**Width 500mm**					
		883951	FD160	horizontal	1 [1]	250	1
		883957	FD160	vertical	2 [1]	250	1
		Width 750mm					
		883956	FD160	horizontal	1 [1]	250	1
		883958	FD160	vertical	3 [1]	250	1
	FE250	**Width 500mm**					
		883960	FE250	horizontal	1	200	1
		883967	FE250	vertical	3	600	1
		Width 750mm					
		883965	FE250	horizontal	1	200	1
		883969	FE250	vertical	3	600	1
Functional unit to mount moulded case circuit breaker type Record Plus Note: all functional units allow front or rear connection of the breaker.	FG630	**Width 500mm**					
		883974	FG630/3pole	horizontal	1	250	1
		883976	FG630/4pole	horizontal	1	250	1
		883988	FG630/3pole	vertical	1	600 [2]	1
		883990	FG630/4pole	vertical	1	600 [2]	1
		Width 750mm					
		883984	FG630/3pole	horizontal	1	250	1
		883986	FG630/4pole	horizontal	1	250	1
		883992	FG630/3pole	vertical	1	600 [2]	1
		883994	FG630/4pole	vertical	1	600 [2]	1

(1) Record Plus FD-frame with lateral RCD, mounted without standard connection kit.
(2) It is advisable to foresee 150mm of cabling space underneath the function.

All functional units fit in enclosure depth 500mm and depth 700mm.

Accessories

Plastic cable binder support	
883996	1

Set of 24 pieces

These supports can be fitted to each functional unit for MCCB Record Plus up to FG frame (630A)

Cover profile	
883970	1

Cover profile for standard cut-outs of 65mm for Record Plus breaker FD and FE frame.

L = 1.2m

Modula Plus

Functional units for MCCB Record Plus

Plug-in, all breakers with manual operation

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
FD160	**883952**	FD160	horizontal	1	150	1
FE250	**883961**	FE250	horizontal	1	200	1
FE250 – with RCD	**883972**	FE250	horizontal	1	200	1
FG630	**883977**	FG630/3 pole	horizontal	1	250	1
	883979	FG630/4 pole	horizontal	1	250	1

Rotary operation

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
FD160 – without RCD	**883953**	FD160/rotary handle	horizontal	1	150	1
FD160 – with RCD	**883954**	FD160/rotary handle	horizontal	1	150	1
FE250 – without or with RCD	**883962**	FE250/rotary handle	horizontal	1	200	1
FG630 – without or with RCD	**883981**	FG630/rotary handle	horizontal	1	250	1
FK1600 – without RCD	**884076** [1]	FK1600/rotary handle	horizontal	1	400	1

Motor operation

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
FD160 – without RCD	**883953**	FD160/motor operation	horizontal	1	150	1
FD160 – with RCD	**883954**	FD160/motor operation	horizontal	1	150	1
FE250 – without or with RCD	**883963**	FE250/motor operation	horizontal	1	200	1
FG630 – without or with RCD	**883982** [1]	FG630/motor operation	horizontal	1	300	1
FK1600 – without RCD	**884077** [1]	FK1600/motor operation	horizontal	1	400	1

(1) MCCB type Record Plus FG630 in horizontal position and FK1600 are fixed on a mounting frame.
For mounting the frame into an enclosure, always two set of depth profiles need to be ordered according to the depth of the enclosure.
e.g. For FG630,motor operation in enclosure
Depth 500mm: 883982 + 2 x 884050
Depth 700mm: 883982 + 2 x 884051

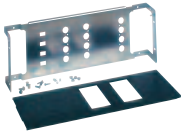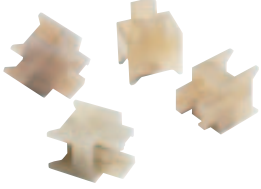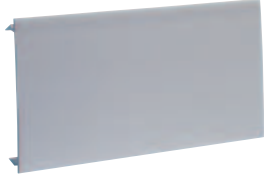All functional units fit in enclosure depth 500mm and depth 700mm.

Cosmos functional unit for MCCB Record Plus FD and FE

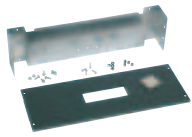### Assembly on copper bars type Cosmos - Vertical Mounting

	Ref. No.	Height	Width	Cut out	Maximum number of Record Plus breakers
	883999	300 mm	500 mm	433 x 66 mm	Type FD 3P = 5 4P = 3
					Type FE 3P = 4 4P = 3

Functional units for disconnector loadbreak switches DILOS
### All switches with rotary handle

Functional unit for load-break switches type DILOS includes:
- mounting plate for the breaker
- cover plate with cut-out
- screws to fix the mounting plate on the functional frame
- screws to fix the cover plate

Functional unit to mount loadbreak switches in a system enclosure type Modula Plus.

Functional unit to for loadbreak switches type DILOS 4, 6S, 7S and 8S include:
- mounting frame for the breaker
- cover plate with cut-outs
- screws to assemble the mounting frame
- screws for the cover plate
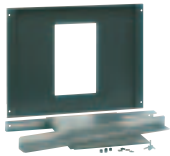
Note: depth profiles always have to be ordered separately according to the enclosure depth.

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
40 up to 125A	**883851**	DILOS 1	vertical	1	200	1
	883852	DILOS 1H	vertical	1	300	1
160 up to 200A	**883851**	DILOS 2	vertical	1	200	1
160 up to 315 A	**883853**	DILOS 3	horizontal	1	250	1
	883854	DILOS 3	vertical	1	300	1
400 up to 630A	**883855** [1]	DILOS 4	horizontal	1	400	1
	883856 [1]	DILOS 4	vertical	1	600	1
800 up to 1250 A – 35kA	**884061** [1]	DILOS 6S	horizontal	1	600	1
	884062 [1]	DILOS 6S	vertical	1	450	1
	Width 750mm					
800 up to 1250 A – 50kA	**884063** [1]	DILOS 6S	horizontal	1	700	1
	884064 [1]	DILOS 6S	vertical	1	600	1
1600 up to 2500 A – 50kA	**884063** [1]	DILOS 7S/8S	horizontal	1	700	1
	884064 [1]	DILOS 7S/8S	vertical	1	600	1

(1) Loadbreak switches type DILOS 4, 6S, 7S, 8S are fixed on a mounting frame.
For mounting the frame into an enclosure, always two sets of depth profiles need to be ordered according to the depth of the enclosure.
e.g. For DILOS 4 horizontally mounted:
Depth 500mm : 883855 + 2 × 884050
Depth 700mm : 883855 + 2 × 884051

All functional units, except DILOS 7S/8S in horizontal position (884063), can be mounted in both depth 500mm and depth 700mm.
884063 requires an enclosure of 700mm depth.

Functional units for disconnector loadbreak switches FULOS
All switches with rotary handle

Functional unit to for fused loadbreak switches type FULOS include:
- mounting frame for the breaker
- cover plate with cut-outs
- screws to assemble the mounting frame
- screws for the cover plate
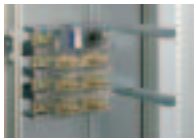
Note: depth profiles always have to be ordered separately according to the enclosure depth.

Depth profile to mount a functional unit type FULOS 1 – FULOS 3S. Two sets of depth profiles need to be ordered with every functional unit depending on the depth of the enclosure.

	Ref. No. of functional unit	Breaker type 3pole/4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
42 up to 160A	**883857**	FULOS 000/FULOS 00/FULOS 0	horizontal	1	250	1
250 up to 400A	**883859** [1]	FULOS 1/FULOS 2	horizontal	1	400	1
630A	**884061** [1]	FULOS 3S (DIN)	horizontal	1	600	1
	884062 [1]	FULOS 3S (DIN)	vertical	1	450	1

(1) Loadbreak switches type FULOS 2-3S are fixed on a mounting frame.
For mounting the frame into an enclosure, always two sets of depth profiles need to be ordered according to the depth of the enclosure.
e.g. For FULOS 2 horizontally mounted:
Depth 500mm : 883859 + 2 × 884050
Depth 700mm : 883859 + 2 × 884051

All functional units fit in enclosure depth 500mm and depth 700mm.

Functional units for automatic changeover switches Record

All breakers with motor operation
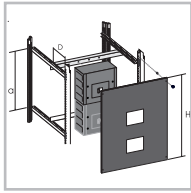
Functional unit for automatic changeover switches includes:
- mounting frame for the breaker.
- cover plate with cut-outs
- Screws to assemble the mounting frame
- screws for the cover plate

Note: depth profiles always have to be ordered separately according to the enclosure depth.

Functional unit for automatic controller for changeover switches type Record.

	Ref. No. of functional unit	Breaker type 3pole/4pole	Mounting position	Qty of breaker	Height mm	Pack.
	Width 500mm					
160A	**883846 (1)**	D160 / DH160 / J160 IDS	horizontal	2	450	1
250A	**883846 (1)**	D250 / DH250 / J250 IDS	horizontal	2	450	1
400A	**883847 (1)**	D400 / DH400 / J400 IDS	horizontal	2	550	1
630A	**883848 (1)**	D630 / DH630 / J630 IDS	horizontal	2	700	1
800A	**883848 (1)**	D800 / DH800 / J800 IDS	horizontal	2	700	1
1250A	**883849 (1)**	D1250 / DH1250 / J1250 IDS	horizontal	2	700	1
Automatic controller	**883850**	Automatic controller for changeover functional units	horizontal	2	250	1

(1) Changeover switches type Record are fixed on a mounting frame.
For mounting the frame into an enclosure, always two sets of depth profiles need to be ordered according to the depth of the enclosure.
e.g. For a changeover functional unit with breaker size 250A:
Depth 500mm : 883846 + 2 x 884050
Depth 700mm : 883846 + 2 x 884051

All functional units, except Record D1250 IDS (883849), can be mounted in both depth 500mm and depth 700mm.
883849 requires an enclosure of 700mm depth.

Cosmos functional unit for industrial fuses

Assembly on copper bars type Cosmos - Vertical Mounting
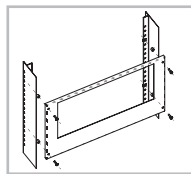
	Ref. No.	Height	Width	Cut out
	884078	300 mm	500 mm	421 x 195 mm

Functional units for air circuit breaker M-Pact Plus
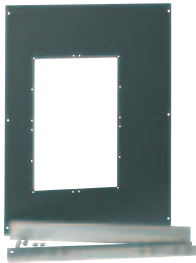
Functional unit for ACB type M-Pact Plus includes:
- mounting frame for the breaker
- cover plate with cut-out
- screws to assemble the mounting frame
- screws to fix the cover plate

Note: a set of depth profiles always needs to be ordered separately according to the enclosure depth
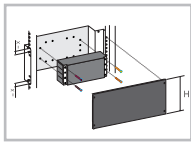

Functional unit to mount ACB in a system enclosure type Modula Plus.

	Ref. No. of functional unit	Breaker type 3pole / 4pole	Mounting position	Qty of breaker	Height mm	Pack.
800A up to 2000A	**Width 500mm**					
	884065 [1]	M-Pact Plus frame 1	vertical	fixed	700	1
	884066 [1]	M-Pact Plus, frame 1	vertical	withdrawable	700	1
800A up to 4000A	**Width 750mm**					
	884067 [1]	M-Pact Plus, frame 1/2	vertical	fixed	700	1
	884068 [1]	M-Pact Plus, frame 1/2	vertical	withdrawable	700	1

(1) Air circuit breakers type M-Pact Plus are fixed on a mounting frame.
For mounting the frame into an enclosure, always one set of depth profiles needs to be ordered according to the depth of the enclosure.
e.g. For M-Pact Plus frame size 1, fixed mounted:
Depth 500mm : 884065 + 1 × 884050
Depth 700mm : 884065 + 1 × 884051

Note: All functional units, except M-Pact Plus frame size 1, fixed (884065), can be mounted in depth 700mm only.884065 can also be fitted in an enclosure of 500mm depth.

Form separation

Enclosures type Modula Plus can be equipped with separation screens Form2 according to standard IEC EN 60439-, which means separation between busbar compartment and functional units with a protection degree of IP2x or IPxxB. Columns with feeder ACB type M-Pact Plus can be equipped with separation screens up to Form 3. The individual separation screens are made of polypropylene (self-extinguishing) with a thickness of 3mm.

Horizontal separation screens Form 2 - Separation between horizontal busbar and functional units

Horizontal separation screens include:
- Separation screen
- Fixation screws

Note: horizontal separation screens are fixed to depth profiles of the horizontal busbar in the top. If there is no busbar system, a set of depth profiles needs to be ordered separately according to the enclosure depth

Ref. No. of form separation	Enclosure dimensions	Pack.
884044	Enclosure width 650mm and 900mm (depth 500mm and 700mm)	1
884045	Enclosure width 400mm (depth 500mm and 700mm)	1

Vertical separation screens Form 2 - Separation between lateral busbar and functional units
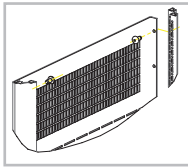
Vertical separation screens include:
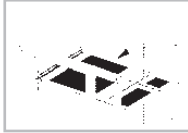- Separation screen
- Fixation screws

Note: vertical separation screens are fixed directly to the vertical uprights of an enclosure.

884042	Panel depth 500mm	1
884043	Panel depth 700mm	1

Vertical separation screens Form 2 - Separation screen for vertical busbar systems in the rear
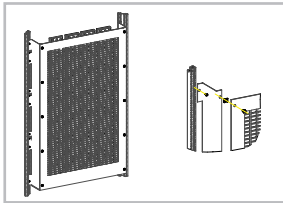
883163	Panel width 650mm and 900mm with integrated cable compartment	1
883164	Panel width 900mm	1

Internal separation Form 3

Separation form 3 for air circuit breaker - Type M-Pact Plus
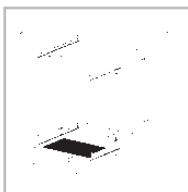
Form 3 separation for ACB type M-Pact Plus includes:
- separation screens IP20
- fixation brackets
- screws to fix brackets and separation screens.

Note: Form 3 separation always requires form 2 separation for the enclosure where the breaker is installed.
For form 2 separation please refer to page B.15.

Functional unit to mount ACB in a system enclosure type Modula Plus, form 3.

Ref. No. of functional unit	Breaker type 3pole/4pole	Mounting type	Pack.
Width 500mm			
M-Pact Plus frame size 1 800A up to 2000A			
884069	M-Pact Plus, frame 1	fixed	1
884070	M-Pact Plus, frame 1	withdrawable	1
Width 750mm			
M-Pact Plus frame size II 800A up to 4000A			
884071	M-Pact Plus, frame 2	fixed	1
884072	M-Pact Plus, frame 2	withdrawable	1

Internal separation form 3 for MCCB Record Plus [1]

Separation of the functions	Ref. No.		
	Width 500 mm		
	884089	without rear busbars	
	Width 750 mm		
	884090	without rear busbars	

(1) Check availability

Notes

Busbars

The busbar system for enclosures range Modula Plus is designed to allow easy installation and combination of horizontal and vertical busbars, whereas the vertical busbar can be located in the back of the enclosure, behind the functional unit or in a lateral busbar compartment.

Nominal current (IP30)
- Horizontal and vertical busbar in a lateral cable compartment:
- 2140 A in an enclosure of 500mm depth (max. 2 bars per phase)
- 4000A in an enclosure of 700mm depth (up to 3 bars per phase)

- Vertical busbar in the back of a functional compartment:
- up to 630A
- up to 2000A

In addition, there is an option to place a vertical staircase busbar system up to 630A in the lateral cable compartment. The copper bars of this kind of busbar system are arranged in different layers, allowing easy cabling of outgoing devices.

Connection of horizontal and vertical busbar system.

Bottom support for vertical busbar system.

Horizontal busbar up to 4000A

Vertical busbar in cable compartment

Vertical busbar in integrated cable compartment
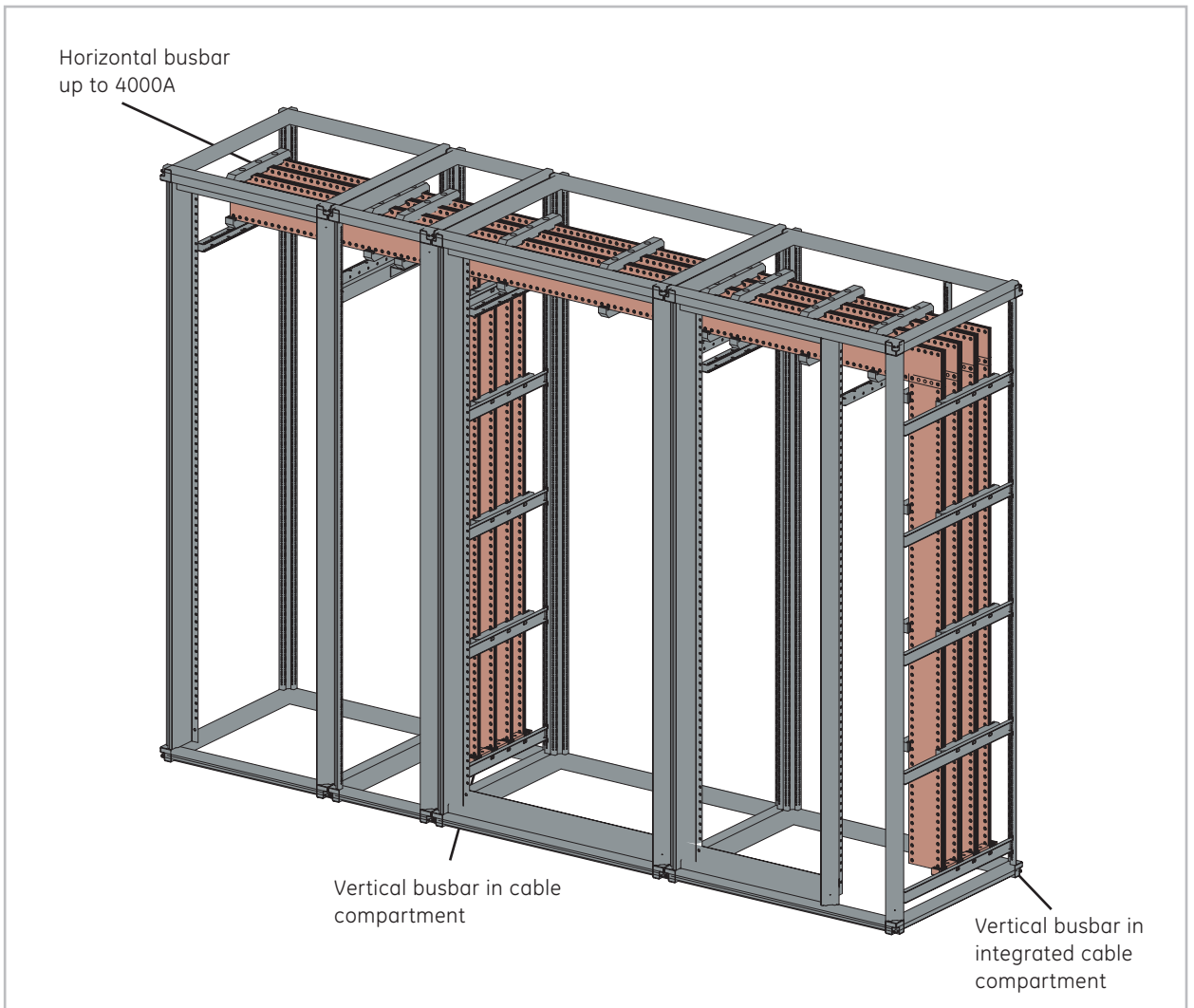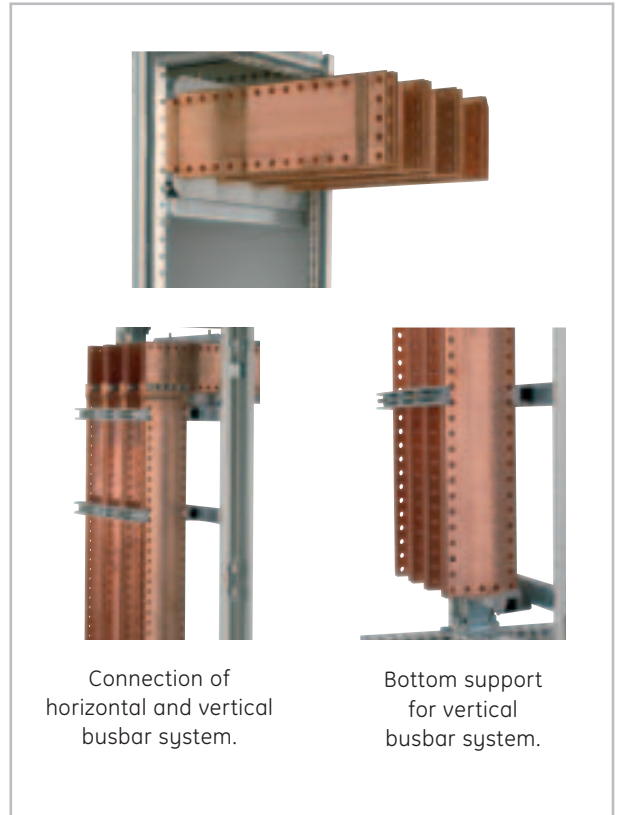
Main busbar system

The main busbar system is based on rectangular copper bars of 5mm thickness and a length of 1650mm. Each bar has lenghtwise diam. 11mm holes every 25mm on both sides for easy and time saving connections and to fix outgoing cables.
The copper bars are bent on one side for lengthwise or square coupling without any additional connecting plate.

The vertical busbar can be mounted in an integrated lateral busbar compartment at left or right side of an enclosure of 900mm width or in a separate cable and busbar compartment.
It is recommended to mount the bottom support of the vertical busbar after defining the exact position of the busbars.

The horizontal busbar system can be mounted at any height of the enclosure Modula Plus and requires a height of 250mm (with copper bars up to 125x5mm) or 300mm (copper bars 160x5mm). The busbars can be front covered by plain cover plates of appropriate height and width.
In enclosures of depth 700mm the space in front of the busbars may as well be used for functional units for terminals or DIN-rail devices.
The supports for the horizontal busbars are the same as for the vertical busbar system.

The busbar supports are fixed to the enclosure by depth profiles, which always need to be ordered separately.
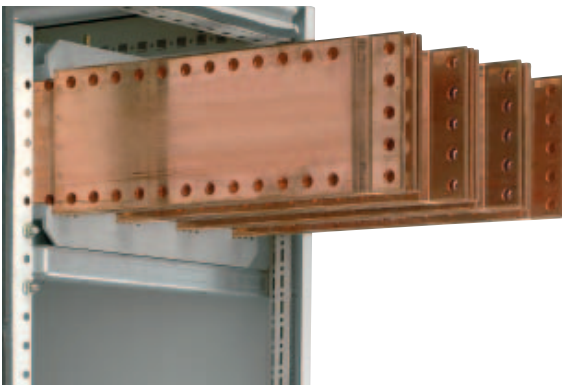
Depth profiles to mount vertical and horizontal busbar

Horizontal busbar in enclosure
The horizontal busbar system is fixed to the functional frame in front and the enclosure structure in the rear with standard depth profiles.

884050	1

Enclosure depth 500mm, set of 2 profiles

884051	1

Enclosure depth 700mm, set of 2 profiles

Vertical busbar in integrated or separate cable compartment
The vertical busbar is fixed to the enclosure structure in front and rear by means of following depth profiles.

884052	1

Enclosure depth 500mm, set of 2 profiles

884053	1

Enclosure depth 700mm, set of 2 profiles
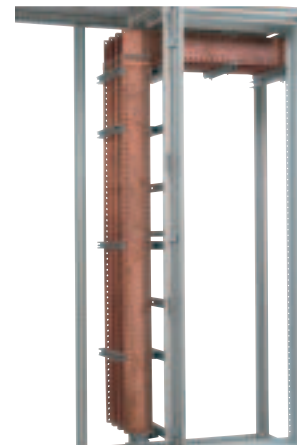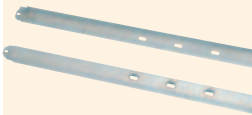
Bottom support for vertical busbar

884054	1

Enclosure depth 500mm and 700mm
The vertical busbar is supported at the bottom by a busbar holder fixed on the depth profiles for the vertical busbar by an additional L-shape profile 884054. This profile may serve as well to support a horizontal busbar in a cable compartment, where no functional frame is available.
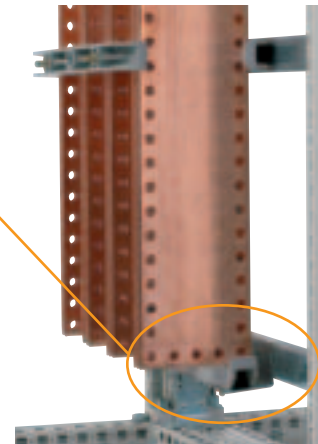
Horizontal busbar

Selection table for horizontal and vertical busbar system

I$_N$ / A		No #	No #	Cu WxD	Icw - L					Coverplate	Ref. No.	Ref. No.
IP30	IP55	L1-L2-L3	N	mm	12kA	25kA	35kA	50kA	70kA	H /mm	Busbar L = 1650mm	Busbar support
740	560	1	1	63x5	835	345	270	170	-	250	883663	883669
900	680	1	1	80x5	940	395	305	200	-	250	883664	883670
1080	820	1	1	100x5	1000	450	355	225	155	250	883665	883671
1250	930	2	1	63x5	1000	485	385	245	165	250	883663	883669
1250	980	1	1	125x5	1000	500	395	260	175	250	883666	883672
1835	1350	2	1	100x5	1000	640	500	320	215	250	883665	883671
2140	1600	2	1	125x5	1000	735	570	365	250	250	883666	883672
2800	2000	3	1	125x5	1000	900	720	450	305	250	883666	883672
3500	2600	3	1	160x5	1000	1000	840	530	365	300	883667	883673
4000	3100	4	2	160x5	1000	1000	960	615	420	300	883667	883673

Modula Plus

Rear mounted busbar system up to 2000A

Enclosures Modula Plus offer an option to use rear mounted busbar system or nominal current up to 2000A.

Technical characteristics	
Admissible current	2000A in IP30
Cross section of busbars	63 x 5mm
	80 x 5mm
Length of busbars	800mm

The busbar system up to 2000A in the rear is based on rectangular copper bars of 5mm thickness and a standard length of 800mm. The bars are fixed to a 4pole busbar holder which is mounted by a means of mounting profile in the rear of the cabinet.
The number of copper bars per phase differs between 1 up to 3 depending on the nominal current requested.
In every case the front bar is bent lengthwise under an angle of 120° and features a row of perforations with diam. 11mm and a center distance of 25mm on the bent side of the bar. These holes facilitates easy connections to outgoing devices.
Due to a flat end on one side of the bars, the busbar system can easily be coupled to a total length of 1600mm. The rear mounted busbar system can be placed at any height inside the enclosure.

CU bars

Bent bars

883675	1

Copper bar 63x5mm, length 800mm

883676	1

Copper bar 80x5mm, length 800mm

Straight bars

883678	1

Copper bar 63x5mm, length 800mm

883679	1

Copper bar 80x5mm, length 800mm

Busbar holder

883681	1

4 pole busbar holder up to 2000A

Mounting profiles

884055	1

Rear profile for enclosure width 650mm and 900mm with integrated cable compartment

884056	1

Rear profile for enclosure width 900mm
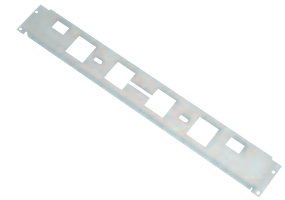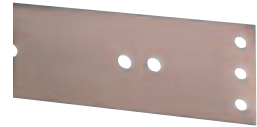
Accessories

Bolts

884117	1

For I < 900A

884118	1

For I > 900A

884126	1

For I < 2000A – for connecting busbars

884127	1

For I > 2000A – for connecing cables to the busbars
Set of 30 pieces to connect cables to the busbars

Copper spacer

883688	1

Set of 10 pieces for connecting flexible bars on busbar system with several layer of copper per phase

Selection table for rear mounted busbar system											
I$_N$ / A		No #	No #	Cu WxD	Icw - D		Cu	Ref. No.	Ref. No.		
IP30	IP55	L1-L2-L3	N	mm	25kA	50kA	L/mm	Cu	Busbar support	W = 650mm	W = 900mm
740	560	1	1	63x5	500	–	800	883675	883681	884055	884056
900	680	1	1	80x5	500	250	800	883676	883681	884055	884056
1250	930	2	1	63x5	500	250	800	883678	883681	884055	884056
								883675			
1600	1200	2	1	80x5	500	250	800	883679	883681	884055	884056
								883676			
2000	1450	3	1	80x5	500	250	800	883679	883681	884055	884056
								883679			
								883676			

Rear mounted busbar system up to 630A

Enclosures Modula Plus offer an option to use rear mounted busbar system or nominal current up to 630A.

Technical characteristics	
Admissible current	630A in IP30
Cross section of busbars	20 x 5mm
	32 x 5mm
	30 x 10mm
Length of busbars	1000mm

The copper bars have pre-tapped holes M6 or M8 (depending on the cross section of the copper bars) for easy cable connection. The busbar holder guarantees high short-circuit resistance and is fixed to the rear structure of the cabinets by a special mounting profile.
A protective shroud of height 1000mm offers the possibility to cover the whole busbar system, offering internal separation of form 2.
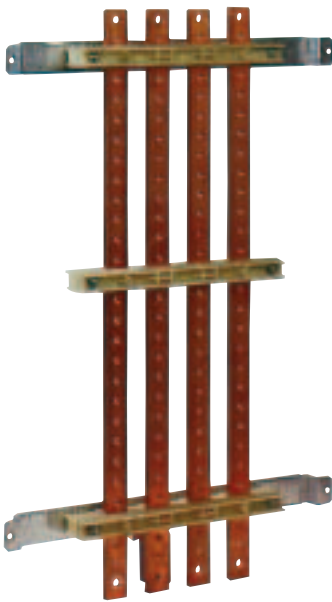
Example of busbar system 630A, to be mounted in enclosure width 650mm:
- 1 x 880851, 4 copper bars 30 x 10mm
- 3 x 880846, busbar holder
- 2 x 884055, mounting profiles W650mm

Busbar holder

880846	1

Mounting profiles

884055	1

for enclosures W650mm and 900mm with integrated cable compartment

884056	1

for enclosures W900mm

Accessories

Bolts

880617	1

Set of 40 bolts M6x16 for copper bars of 20x5mm and 32x5mm

880852	1

Set of 40 bolts M8x20 for copper bars of 30x10mm

Protective shroud

880619	1

530 x 1000mm

Order codes

A

B

C

X

Selection table for rear mounted busbar system											
I_N / A		Cu W x D	Tapped holes	Icw - D			Cu L/mm	Ref. No. Cu	Ref. No. Busbar support	W = 650mm	W = 900mm
IP30	IP55			15kA	20kA	30kA					
320	250	20x5	M6	400	300	–	1000	880847	880846	884055	884056
400	360	32x5	M6	675	-	300	1000	880850	880846	884055	884056
630	560	30x10	M8	900	-	450	1000	880851	880846	884055	884056

Modula Plus

Lateral busbar system up to 630A

Enclosures Modula Plus can be equipped with busbar system up to 630A located in the lateral cable or busbar compartment at left or right side of the cabinet.

Technical characteristics	
Admissible current	630A in IP30
Cross section of busbars	20 x 5mm
	32 x 5mm
	30 x 10mm
Length of busbars	1000mm

The copper bars have pre-tapped holes M6 or M8 (depending on the cross section of the copper bars) for easy cable connection.

The busbar holder for lateral busbar systems has a staircase shape which eases the cabling of the different phases. Like in the rear mounted busbar systems, the staircase busbar system can be equipped with a protective shroud to prevent from accidental access to life parts, offering internal seggragation of form 2.

Mounting in Modula Plus:
For mounting a busbar system of 630A in the lateral cable compartment some fixation brackets are required to fix the busbar holder in the rear of the cable compartment.

Staircase busbar holder

	880934	1

Set of 4 pcs, 4 pole

	880935	1

1 pc, 4 pole
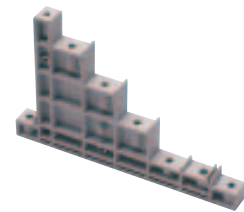
Accessories to mount the staircase busbar in an integrated cable compartment

	884058 [1]	1

Mounting brackets, set of 2 pieces
(1) please order one set for each busbar support
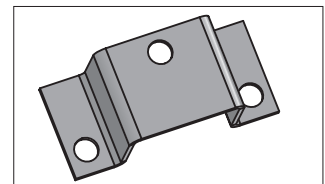
Protection shroud

	880936	1

Frontal, IP20

	880937	1

Set of frontal and lateral, IP20

	880938	1

Set of top and bottom

Accessories

Bolts

	880617	1

Set of 40 bolts M6x16 for copper bars of 20x5mm and 32x5mm

	880852	1

Set of 40 bolts M8x20 for copper bars of 30x10mm

Selection table for rear mounted busbar system												
I_N / A		Cu W x D	Tapped	Icw - D				Cu	Ref. No.	Ref. No.	Ref. No.	
IP30	IP55	mm	holes	15kA	20kA	25kA	30kA	L/mm	Cu	Busbar support	Mounting bracket	Qty
320	250	20x5	M6	400	300	-	-	1000	880847	880935	884058	2
400	360	32x5	M6	600	400	300	-	1000	880850	880935	884058	2
630	560	30x10	M8	800	600	450	300	1000	880851	880935	884058	2

Earthing busbars

In enclosures Modula Plus horizontal and vertical earthing bars can be realised with copper bars of cross section 32x5mm. The bars have a standard length of 1750mm and are provided with pre-drilled holes on its whole length. The earth bars are fixed to the functional frame by brackets included in the delivery of the bars.
The vertical bar is bent with an angle of 90° at one side, offering an simple possibility to connect to the horizontal busbar.

Coupling of horizontal and vertical earth bars

Kit for vertical earth bar

883059	1

Kit for vertical earth bar
Containing of one copper bar, L 1750mm, 4 cage nuts and screws for fixing to the functional frame

Kit for horizontal earth bar

883060	1

Kit for horizontal earth bar
Containing one copper bar, L 1750mm, 4 cage nuts and screws for fixing to the functional frame

Possible configuration of busbar systems

The drawing on the right gives an overview of all different kind of busbar configurations which may be implemented in system enclosures Modula Plus:

- rear busbars up to 630A
- rear busbars up to 2000A
- lateral staircase busbars up to 630A
- vertical busbars up to 4000A
- horizontal busbars up to 4000A
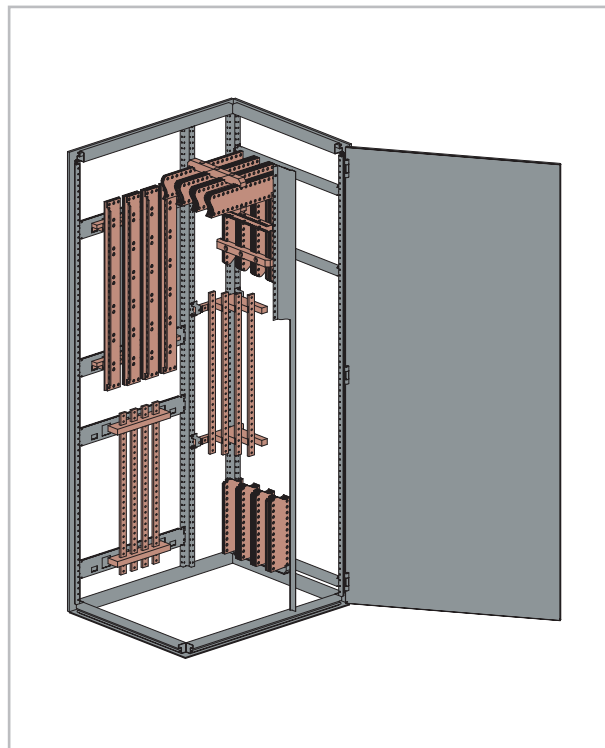
Notes

Modula Plus

Modula Plus

System enclosure for Low Voltage distribution panel from 160 up to 4000A

Conformity to standards
The panels are complying to the standard EN 60439-1
All typetests and individual tests required by the standard have been done.
Internal separation Form 1, Form 2 as option.

Technical characteristics
The panel is designed of kit-form enclosures made from sheet steel, which can be stand alone and coupled next to each other. Each cabinet consists of a strong, welded top and bottom frame to which the vertical uprights are bolted. Top and bottom frame and vertical uprights offer a pattern of rectangular and round holes for easy fixation of functional units, depth profiles and busbars.

They consist of three different compartments, all of them fully accessible from the front.

The busbar compartment
The main busbar is located in the top of the enclosure and is based on flat, rectangular copper provided with holes diameter 11mm for easy coupling and connection of wires and busbars in step of 25mm. Cross section from 63x5mm up to 160x5mm. Center distance 90mm. The bars are provided with a bending at one end to allow easy connection with each other.

The compartment for functional units
The panels are equipped with individual functional units, consisting of mounting plates or mounting frames supporting one or more low voltage devices and covered with metal coverplates to prevent from accidental access to live parts.
- functional units for DIN-rail equipment
- functional units for meters
- functional units for Moulded Case Circuit Breaker from 125 up to 1250A. The devices are mounted fixed in horizontal or vertical position
- functional units for Loadbreak Switches up to 3150A. The devices are mounted fixed in horizontal or vertical position
- functional units for Air Circuit Breakers up to 4000A.
The devices are mounted fixed or withdrawable.
The design of functional units allow quick and easy replacement or modification of the units.

The cable compartment
An integrated cable compartment located at the left or right side of the enclosure guides outgoing cables or contains vertical busbar based on flat, rectangular copper provided with holes diameter 11mm for easy coupling and connection of wires and busbars in step of 25mm. Cross section from 63x5mm up to 160x5mm. Center distance 90mm. The bars are provided with a bending at one end to allow easy connection with each other.
For rated current up to 630A a staircase type of busbar based on flat copper from 20x5mm up to 30x10mm is used for easy interconnection between the busbar and outgoing Low Voltage devices.
The bars are provided with threaded holes M6 or M8 and can be covered by a protective shroud IP20 as option.

Electrical characteristics
Rated operational voltage	690V
Rated insulation voltage	1000V
Rated short-circuit withstand current	70kA / (1s)
Rated current of the busbar system	up to 4000A
Degree of protection	IP55
	IP30

The panel is designed for indoor use
Ambient temperature	35°
Name of the product	Modula Plus

Enclosure dimensions

Width 400mm

Dimensions (mm)							
H	W	D	d1	d2	d3	w3	h1
2000	400	500	412	505	340	240	1800
2000	400	700	612	705	540	240	1800

Width 650mm

Dimensions (mm)							
H	W	D	d1	d2	d3	w3	h1
2000	650	500	326	505	340	490	1800
2000	650	700	526	705	540	490	1800

Width 900mm

Dimensions (mm)									
H	W	D	d1	d2	d3	w1	w2	w3	h1
2000	900	500	326	505	340	500	207	740	1800
2000	900	700	526	705	540	500	207	740	1800

Dimensions between door and internal coverplate (top view)

space functional units   cable compartment

Dimensions
A
B
C
X

Modula Plus

Heat dissipation values

Principle
According to EN 50298 and IEC 60890
For common electical applications, a temperature rise of 50K is generally accepted. If the rise is above 50K, a larger enclosure or means of ventilation should be chosen.
More volume or decrease of IP degree results in a decrease of the temperature rise. The absolute temperature in °C inside 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. 80 °C. Depending on the enclosure dimension the temperature rise caused by power losses of electrical components installed inside varies.

How to use the Matrix
First chose the right matrix according to the position and size of enclosure.
Second calculate the effective power loss in Watt (left column) of all electrical components and busbars installed. Add 10-20% to the total effective power loss in order to compensate small wirings and connectors.
Third read in the matrix the temperature rise expected due to the thermal power dissipation.

Data
The following tables give an overview of heat dissipation values of the several enclosures types. Modula Plus depending on the way they are installed. Temperature rise always is given for the top and a location in the middle of the enclosure.

Stand alone - IP55 — Temperature rise [Kelvin]

DISSIPATION	2000x500x650		2000x500x900		2000x700x650		2000x700x900	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	12	18	10	15	11	15	9	13
220	13	19	11	16	11	16	10	14
240	14	21	12	17	12	17	11	15
260	15	22	13	18	13	19	12	16
280	16	23	13	19	14	20	12	17
300	16	25	14	20	15	21	13	18
350	19	28	16	23	16	24	15	20
400	21	31	18	26	18	26	16	22
450	23	34	20	28	20	29	18	25
500	25	37	21	31	22	31	19	27
550	27	40	23	33	24	34	21	29
600	29	43	25	36	25	36	23	31
650	31	46	27	38	27	39	24	33
700	32	49	28	40	29	41	26	35
750	34	52	30	43	30	44	27	37
800	36	54	31	45	32	46	28	39
850	38		33	47	34	48	30	41
900	40		34	49	35	50	31	43
950	41		36	52	37	53	33	45
1000	43		38	54	38	55	34	47
1100							37	50
1200							39	54
1300							42	
1400							45	

Stand alone - IP55 - with separate busbar compartments — Temperature rise [Kelvin]

DISSIPATION	2000x500x650+400		2000x500x900+400		2000x700x650+400		2000x700x900+400	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	10	13	9	12	9	12	8	11
220	10	15	10	13	10	13	9	12
240	11	16	10	14	10	14	9	12
260	12	17	11	15	11	15	10	13
280	13	18	12	16	12	16	11	14
300	13	19	12	17	12	17	11	15
350	15	21	14	19	14	19	13	17
400	17	24	15	21	15	21	14	19
450	18	26	17	23	17	23	16	21
500	20	28	18	25	19	25	17	22
550	22	30	20	27	20	27	18	24
600	23	33	21	29	21	29	20	26
650	25	35	23	31	23	31	21	28
700	26	37	24	33	24	33	22	29
750	28	39	26	35	26	35	24	31
800	29	41	27	37	27	36	25	33
850	31	43	28	39	28	38	26	34
900	32	45	30	40	30	40	27	36
950	34	47	31	42	31	42	28	38
1000	35	49	32	44	32	44	30	39
1100	38	53	35	48	35	47	32	42
1200	41		37	51	37	50	34	45
1300	43		40	54	40	54	37	48
1400			42		42		39	51

Technical data

A
B
C
X

Rear against wall - IP55 — *Temperature rise [Kelvin]*

DISSIPATION Watt	2000x500x650 Half	Top	2000x500x900 Half	Top	2000x700x650 Half	Top	2000x700x900 Half	Top
200	13	19	11	16	11	16	10	13
220	14	20	12	17	12	17	11	14
240	15	22	13	18	13	18	12	16
260	16	23	14	20	14	19	12	17
280	17	25	15	21	15	21	13	18
300	18	26	16	22	16	22	14	19
350	20	30	18	25	18	25	16	21
400	22	33	20	28	20	28	17	23
450	25	36	22	30	22	30	19	26
500	27	39	24	33	23	33	21	28
550	29	43	25	36	25	36	23	30
600	31	46	27	38	27	38	24	32
650	33	49	29	41	29	41	26	35
700	35	52	31	43	31	43	27	37
750	37	55	33	46	33	46	29	39
800	39		34	48	34	48	30	41
850	41		36	51	36	50	32	43
900	43		38	53	38	53	34	45
950	45		39		39		35	47
1000	47		41		41		36	49
1100							39	53
1200							42	
1300							45	
1400							48	

Rear against wall - IP55 - with separate busbar compartments — *Temperature rise [Kelvin]*

DISSIPATION Watt	2000x500x650+400 Half	Top	2000x500x900+400 Half	Top	2000x700x650+400 Half	Top	2000x700x900+400 Half	Top
200	11	14	10	13	9	12	9	11
220	11	16	10	14	10	13	10	12
240	12	17	11	15	11	14	10	13
260	13	18	12	16	12	15	11	14
280	14	19	13	17	12	16	12	15
300	15	20	13	18	13	17	12	16
350	17	23	15	20	15	20	14	18
400	18	25	17	22	16	22	15	20
450	20	28	18	25	18	24	17	22
500	22	30	20	27	20	26	18	24
550	24	33	22	29	21	28	20	26
600	25	35	23	31	23	30	21	27
650	27	37	25	33	24	32	23	29
700	29	40	26	35	26	34	24	31
750	30	42	28	37	27	36	25	33
800	32	44	29	39	29	38	27	35
850	34	46	31	41	30	40	28	36
900	35	49	32	43	32	42	29	38
950	37	51	33	45	33	44	31	40
1000	38	53	35	47	34	45	32	41
1100	41		38	50	37	49	35	45
1200	44		40	54	40	53	37	48
1300			43		43		40	51
1400			46		45		42	54

A
B
C
X

Heat dissipation values

Front, left and upperside free - IP55 — Temperature rise [Kelvin]

DISSIPATION	2000x500x650		2000x500x900		2000x700x650		2000x700x900	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	13	19	12	16	12	17	11	14
220	14	21	13	18	13	18	12	15
240	15	22	14	19	14	19	12	16
260	16	24	15	20	15	21	13	17
280	17	25	16	22	16	22	14	18
300	18	27	17	23	17	23	15	20
350	21	30	19	26	19	26	17	22
400	23	33	21	29	21	29	19	25
450	25	37	23	32	23	32	21	27
500	28	40	25	34	25	35	22	29
550	30	43	27	37	27	38	24	32
600	32	46	29	40	29	41	26	34
650	34	49	31	43	31	43	28	36
700	36	52	33	45	33	46	29	39
750	38		35	48	35	49	31	41
800	40		36	50	37	51	33	43
850	42		38	53	39	54	34	45
900	44		40		41		36	47
950	46		42		43		37	49
1000	48		43		44		39	51
1100							42	
1200							45	
1300							48	
1400							51	

Front, left and upperside free - IP55 - with separate busbar compartments (*)

DISSIPATION	2000x500x650+400		2000x500x900+400		2000x700x650+400		2000x700x900+400	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	11	15	10	13	10	13	9	12
220	12	16	11	14	11	14	10	12
240	13	17	12	15	12	15	11	13
260	14	19	12	16	12	16	11	14
280	15	20	13	17	13	17	12	15
300	15	21	14	18	14	18	13	16
350	17	23	16	21	16	20	14	18
400	19	26	17	23	17	23	16	20
450	21	29	19	25	19	25	18	22
500	23	31	21	27	21	27	19	24
550	25	34	22	30	23	29	21	26
600	27	36	24	32	24	31	22	28
650	29	39	26	34	26	33	24	30
700	30	41	27	36	27	35	25	32
750	32	43	29	38	29	37	26	33
800	34	46	30	40	30	39	28	35
850	35	48	32	42	32	41	29	37
900	37	50	33	44	33	43	31	39
950	39	52	35	46	35	45	32	40
1000	40	55	36	48	36	47	33	42
1100	44		39	52	39	51	36	46
1200			42	55	42	55	39	49
1300					45		41	52
1400							44	55

(*) Temperature rise [Kelvin]

Frontside and upperside free - IP55

Temperature rise [Kelvin]

DISSIPATION	2000x500x650		2000x500x900		2000x700x650		2000x700x900	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	14	20	13	17	13	18	12	15
220	16	22	14	18	14	19	12	16
240	17	24	15	20	15	20	13	17
260	18	25	16	21	16	22	14	18
280	19	27	17	22	17	23	15	19
300	20	28	18	23	18	25	16	20
350	23	32	20	27	21	28	18	23
400	25	36	22	30	23	31	20	26
450	28	39	24	33	25	34	22	28
500	30	43	26	35	28	37	24	31
550	33	46	29	38	30	40	26	33
600	35	49	31	41	32	43	28	36
650	37	53	33	44	34	46	30	38
700	40		35	46	36	48	32	40
750	42		37	49	38	51	33	43
800	44		39	52	40	54	35	45
850	46		40	54	42		37	47
900	48		42		44		39	49
950	51		44		46		40	51
1000	53		46		48		42	54
1100							45	
1200							49	
1300							52	
1400								

Frontside and upperside free - IP55 - with separate busbar compartments (*)

DISSIPATION	2000x500x650+400		2000x500x900+400		2000x700x650+400		2000x700x900+400	
Watt	Half	Top	Half	Top	Half	Top	Half	Top
200	12	15	10	13	11	13	10	12
220	13	17	11	14	12	14	10	13
240	14	18	12	15	12	15	11	14
260	14	19	13	16	13	16	12	14
280	15	20	14	17	14	18	13	15
300	16	21	14	18	15	19	13	16
350	18	24	16	21	17	21	15	18
400	20	27	18	23	19	23	17	20
450	22	29	20	25	20	26	18	23
500	24	32	22	28	22	28	20	25
550	26	35	24	30	24	30	22	26
600	28	37	25	32	26	32	23	28
650	30	40	27	34	28	34	25	30
700	32	42	29	36	29	37	26	32
750	34	44	30	38	31	39	28	34
800	36	47	32	40	33	41	29	36
850	37	49	33	42	34	43	31	38
900	39	51	35	44	36	45	32	39
950	41	54	37	46	37	47	34	41
1000	43		38	48	39	49	35	43
1100	46		41	52	42	53	38	46
1200	49		44		45		41	50
1300	53		47		48		43	53
1400			50		51		46	

(*) Temperature rise [Kelvin]

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